Active Sub-slab Depressurization (ASD) System Work Plan

Harrison Place Site
Brownfield Cleanup Program (BCP)
Site No. C932177
Lockport, New York

September 2024
Revised December 2024

Prepared for:

Kearney Realty & Development Group, Inc.

Prepared by:

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Certification

I, Lori E. Riker, certify that I am currently a NYS-registered Professional Engineer and that this December 2024 ASD System Work Plan for the Harrison Place Site (C932177) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

12/20/24

Date

Stamp:

1. Introduction

This document presents the proposed active sub-slab depressurization (ASD) system design and work plan for the Harrison Place Site, Brownfield Cleanup Program (BCP) Site No. C932177, referred herein as Site. The Site building is located at 210 Walnut Street, Lockport, New York (see Figures 1 and 2).

1.1 Background and History

The Site consists of Building No. 3, located in the southeast corner of the former Harrison complex. The complex consists of 5 buildings. The Harrison Place Site encompasses a single tax parcel, totaling approximately 1.5-acres, located in Lockport, Niagara County, New York (see Figures 1 and 2).

The greater tax parcel property boundary is bound by Walnut Street to the north, Washburn Street to the east, South Street to the south, and Locust Street to the west. The surrounding land-use is mixed use, including residential, commercial, and industrial. Properties adjacent to the Site include primarily residential, industrial (warehouse and distribution facilities), commercial, and vacant use. Building No. 2 and 3 are three-story former manufacturing buildings that are interconnected. Building No. 3 was the main production and assembly building for Harrison Radiator.

Remedial Investigation (RI) field work was completed between April 6 and June 1, 2021 with additional sampling completed March 31 and April 26, 2022. Results of the RI sub-slab vapor/indoor air sampling indicated that an ASD system is required for Building No. 3 to mitigate potential soil vapor intrusion due to elevated concentrations of cis-1,2-dichloroethene (cis-1,2-DCE), tetrachloroethene (PCE), and trichloroethene (TCE) in the subsurface (Figure 3). The purpose of this Work Plan is to document the measures to be taken by Kearney Realty & Development Group, Inc. to protect the areas of Building No. 3 from potential soil vapor intrusion (SVI) due to residual subsurface contamination.

The building is currently vacant and undergoing remediation and renovation. Kearney Realty & Development Inc. plans to install the ASD system during renovation activities to avoid future business disruption during future operations. Future uses of the structure include commercial and event space on the ground floor with residential apartments on the second and third floors. Figure 3 includes ASD system installation tasks as they fall within the overall BCP project timeline.

2. Active Sub-slab Depressurization (ASD) System Design & Installation

2.1 General

An ASD system creates a low-pressure zone beneath a building slab using a powered blower(s) connected by piping to create a vacuum beneath the building slab. The low-pressure field prevents soil gas from entering the building. In an existing building where an ASD system will be installed, communication testing is typically done to estimate where extraction piping runs can be efficiently and aesthetically installed. During installation, there maa be conditions encountered that will necessitate relocation of some of these features and may necessitate variations to the design. However, under all circumstances post-installation communication testing will be completed to confirm the building is properly protected.

2.1.1 Building Conditions

Building No. 3 was the main production and assembly building for Harrison Radiator. Generally, the property was used from 1914 to 1987 (70 years) by Harrison Radiator Division for the manufacturing of copper and brass automobile parts and including thermostats, vacuum and electric switches, modulators, and heat exchangers. Building No. 3 is a three-story brick and concrete structure with an open, full height center atrium that runs the full length of the building. A series of vertical columns on both the north and south sides of the building support the second and third floors. A large boiler room/steam plant area was in the southwest corner of the building with access to an approximately 3,000 square foot basement. The 64,733 square foot building consists of slab on grade foundation with an average thickness of 7 inches and maximum thickness of 12 inches. SVI mitigation is required underlying existing Building No. 3.

2.2 Communication Testing

Communication testing was completed within the on-site building on October 17, 2023. The purpose of this testing was to assess the vacuum field generated from a suction point at strategically located monitoring points; and thus, to gauge the radius of influence (ROI). The June 2015 U.S. EPA guidance for vapor intrusion assessment and mitigation (Ref. 2) does not include a definite value for ASD system design; however, achieving a pressure differential of -0.004 inches of water column (in. w.c.) across the slab is generally considered sufficient to mitigate vapor intrusion based on available industry guidance[1]. This was done by inducing a vacuum in the subsurface and monitoring the differential pressure in monitoring points to assist in designing the layout for the permanent suction points. Suction points were created by drilling a 3-inch diameter hole through the floor slab. A rigid section of 3-inch polyvinyl (PVC) pipe was inserted into the hold and connected to a blower (capable of developing up to 10 inches of WC). Clay was used to seal the hole between the floor slab and the pipe. Monitoring points were drilled at several locations away from the suction points and consisted of ½-inch holes drilled through the floor slab. Flexible Tygon tubing was connected to a handheld manometer and inserted in the monitoring points. The outside of the Tygon tubing was sealed with clay. The blower was activated, and the vacuum was measured at the monitoring points. Figure 4 provides the communication testing locations and Table 1 summarizes vacuum readings.

[1] Brodhead, William and Thomas E. Hattan. *High Vacuum, High Airflow Blower Testing and Design for Soil Vapor Intrusion Mitigation in Commercial Buildings.* pp.2. NJDEP Vapor Intrusion Technical Guidance (Version 5.0), May 2021, Section 6.4.2.4, pp. 90.

2.2.1 Building Communication Testing Results

Communication testing indicated an ROI beneath the building footprint of approximately 30 feet. The ASD system is designed with extraction piping being placed within five separate trenches running east to west along the length of the building and backfilled with clean stone material. The design approach and system installation are described in Section 2.3 and 2.4.

2.3 ASD System Design-Build Approach

Gilson Engineering and Associates designed the ASD system layout in general accordance with AARST Consortium of National Standards design document entitled “Soil Gas Mitigation Standards for existing Multifamily, School, Commercial and Mixed-Use Buildings.” The system will be constructed under a design-build approach to accommodate potential sub-slab variabilities that may be encountered during installation by real-time communication testing which may result in increasing/decreasing the number of trenches, location and length of trenches, number and type of blowers, and piping configurations. The following text details portions of the design criteria, methodology, and critical installation methods.

Under all circumstances post-installation communication testing will be completed to confirm the building is properly protected.

2.4 ASD System Installation

The ASD system will be installed by an experienced contractor familiar with sub-slab depressurization systems and radon control systems, in accordance with the design criteria and specifications contained on Figures 5 and 6; Gilson Engineering and Associates civil drawings provided in Appendix B; and typical construction practices. Prior to ASD system installation, the building and site plans will be inspected for existing and/or potential vapor intrusion pathways (i.e., sumps, pits, vaults, cracks in slab/walls, drains, crawl space, etc.). Pathways will be sealed as part of ASD system installation.

The treatment area will consist of five separate trenches running east to west along the length of the building, approximately 411 feet long. Trenches will be spaced approximately 30 feet apart and 15 feet from exterior walls. ASD piping will be installed within trenches within the treatment area. Two 4-inch vertical PVC risers will be installed, both located approximately midway of the length of the building. The first vertical riser will be located between the two most northern trenches and the second between the three most southern trenches. Each riser will be connected to an independently operated blower fan. Figure 5 shows proposed trench locations and approximate riser locations.

Sub-slab 4-inch perforated extraction piping will be installed in the excavated trenches and backfilled with clean 1-inch stone. Following ASD piping installation and other sub-slab utility piping/trenching, a new concrete floor will be poured across the footprint of Building 3.

Soil generated from beneath the building will be screened by a qualified environmental professional and stockpiled for off-site transportation and disposal. Concrete will be transported off-site to an approved recycling facility. Disposal documents will be provided in the Final Engineering Report (FER).

2.4.1 Health and Safety

All work proposed in this Work Plan will be performed in accordance with the November 2023 Health and Safety Plan (HASP) containing the Community Air Monitoring Plan (CAMP). One CAMP station will be

operated during excavation of the trenches. If exceedances of action levels listed in the CAMP occur, they will be reported to NYSDEC and New York State Department of Health (NYSDOH) Project Managers

2.4.2 General Design Criteria

The vertical riser pipes will be behind finished surfaces of the future residential and commercial use areas. To alleviate potential confusion in the event of a plumbing repair, riser pipes will be labeled to differentiate from the plumbing lines. An exhaust vent will be installed at each fan and will be vented a minimum of 12 inches above the finished roof elevation and at least 10 feet away from any opening that is less than two feet below the exhaust point, and 10 feet away from any adjoining or adjacent buildings, or HVAC intakes or supply registers.

Fans/blowers will be hard-wired to a dedicated electrical circuit for which a dedicated breaker will be installed and properly labeled in the breaker box.

Upon system installation, all slab, wall, floor or ceiling penetrations, expansion joints, cracks, and/or any other gaps in the slab and/or subsurface walls, will be sealed using a polyurethane sealant or non-stick grout applied in accordance with manufacturer's instructions.

2.4.3 Monitoring of the System

A differential pressure gauge (e.g., Magnehelic or similar) and alarm indicator (e.g., warning light) will be connected to each terminal riser connected to the independent fan blower to allow for system vacuum monitoring and troubleshooting. The radon pressure monitor and alarm will be installed in each of the 2nd floor mechanical rooms as specified on the plumbing drawings. The vacuum gauges will measure and display the instantaneous negative pressure produced by the blower to indicate whether the system is operational. The alarm indicator will identify signal if there is insufficient vacuum in the associated vent pipe and extraction fan. Exhaust fans and associated monitoring alarms will be on separate electrical circuits. Specific details of the monthly monitoring and annual certification of the ASD System will be provided in the Site Management Plan (SMP).

3. Post-Installation Communication Testing

3.1 General

The ASD system will require performance testing to confirm system effectiveness and proper installation. Post-installation communication testing will be completed during and immediately after system installation. The following steps will be performed, documented, and then reported in the FER.

3.2 Visual Inspection

All system components will be visually inspected by a qualified person to ensure proper installation. The building will be inspected for potential vapor intrusion pathways (i.e., cracks in slab/walls, drains, vaults, and pits) and if identified, sealed appropriately. With the depressurization system operating, smoke tubes may be used to check for leaks through floor joints and at suction points. Any leaks will be identified, noted, and repaired prior to continuing with testing and confirmation.

3.3 ASD System Start-up and Troubleshooting

A field test will be conducted to confirm the negative pressure created beneath the slab immediately following installation and again prior to long-term occupancy. Nominal ¼-inch diameter holes will be drilled through the concrete slab. Points will be located strategically across the building footprint to demonstrate that the project objective has been met (i.e., creation of a negative pressure zone beneath the building slab of at least -0.004 inches of w.c.)[2]. With the depressurization system operating, the vacuum will be measured using a handheld digital micro-manometer or comparable instrument at the test locations. Temporary test locations will not be sealed until the normal system operations discussed in Section 4.1 are achieved. Any temporary locations with the potential to be covered during construction work (i.e., new flooring installation) will be sealed using polyurethane caulk and a new temporary test location will be selected, or a new temporary location will be installed in the same general location of the original location after the new floor is installed. Seven of the temporary test locations will be converted to a permanent vacuum ports to allow for long-term monitoring; these sample ports will be located the farthest away from blowers/trenches and/or near historic vacuum monitoring points that exhibited the lowest initial vacuum readings in the given space. Locations within non-occupied areas, such as custodial/mechanical and/or electrical rooms, will be favored for future ease of access. Concurrent with sub-slab testing, manometer readings for all suction points/ blowers will be recorded.

If adequate depressurization is not occurring the following procedures will be enacted:

- All testing procedures will be repeated to ensure proper testing protocols were followed
- Client and NYSDEC personnel will be informed of inadequate vacuum results

Troubleshooting of the system will then be completed, including the following:

- Confirmation of blower operation
- Inspection of and sealing/re-sealing of all major entry routes and penetrations (if necessary)
- Inspection of the HVAC system and determination whether the HVAC system(s) has a negative effect on the performance of the ASD system

[2] Upon completion of the testing, the holes will be sealed with polyurethane caulk.

Upon completion of troubleshooting as described above, if re-testing indicates insufficient communication the following measures will be considered:

- Adjustment of the HVAC system(s),
- Blower modification or replacement; and/or
- Installation of additional vacuum suction points.

Field testing results will be submitted to the NYSDEC and NYSDOH for review and approval prior to long-term occupancy.

3.4 Indoor Air Sampling

Prior to public occupancy, confirmatory indoor air sampling will be completed throughout the entire structure once the building is fully enclosed and the heating, ventilation, and air conditioning (HVAC) system is operating under normal conditions. An Indoor Air Sampling Work Plan will be submitted under separate cover to the NYSDEC and NYSDOH for review and approval.

4. ASD System Operation, Maintenance, & Monitoring

4.1 ASD Systems Operation

This ASD system has been designed for continuous operation with minimal maintenance and/or operational oversight. A “normal” operating pressure will be established for each blower by measuring the pressure at each vacuum gauge and establishing a benchmark. Initially, the pressure will be measured approximately four hours after initial system start-up. Following this initial vacuum reading, NYSDEC will be consulted and a typical operating vacuum range will be established. Another reading will be taken and recorded after approximately one week of operation to check if significant change in pressure readings is observed relative to the initial “normal” operating pressure. If there is a significant pressure difference from the “normal” operating pressure, one that falls outside of the typical operating vacuum range, additional inspections will be made until the pressure stabilizes. If readings do not stabilize within three to four weeks, troubleshooting of the system will be completed as described in Section 3.3.

System start-up readings will be submitted to the NYSDEC and NYSDOH for review and approval prior to long-term occupancy.

4.2 Annual Certification/Inspection

As part of the Site Management Plan (SMP), an annual system inspection and report documenting that the ASD system is performing properly and remains effective will be required by the NYSDEC and is to the certified by a professional engineer or qualified environmental professional. The certification report will contain an annual inspection checklist. The annual inspection will require:

- System components to be visually inspected
- The exhaust blowers to be inspected for signs of abnormal operation or bearing failure (service and/or replacement if necessary)
- Discharge location inspection – to verify no air intake has been located nearby vent pipes
- HVAC system inspection to determine if it being maintained and operated as designed
- Detailed floor, wall, and slab inspection for cracks (resealing if necessary); smoke tubes may be used to check for leaks through floor joints and at suction points with the ASD system running

Additional long-term inspection and monitoring details required by NYSDEC/NYSDOH will be specified in the SMP.

4.3 Systems Failure Protocols

In the event the system is not working properly, the radon pressure monitor and alarm located in each of the 2nd floor mechanical rooms will go off, indicating that there is insufficient vacuum in the associated vent pipe. The following protocol should be followed:

- The building owner/operator and management company will be contacted immediately
- The building owner/operator will apprise the Department of the system failure
- The date and time will be recorded
- The warning device will be identified

- The blowers will be inspected to confirm operation; if a circuit breaker was tripped causing the blower to cease operation, the circuit breaker will be reset
- System components will be visually inspected for signs of damage or dysfunction

If the system failure is not remediated, the building owner should contact a qualified engineer or other person with experience in ASD systems to inspect the system and take the necessary measures to place the system back in service. The NYSDEC and NYSDOH will be apprised of any system failure or other defect that compromises the system within 48-hours or as otherwise required in the approved site management plan; full monitoring and notifications requirements will be detailed in the final site management plan, which will supersede this document.

5. References

1. AARST Consortium of National Standards "*Soil Gas Mitigation Standards for existing Multifamily, School, Commercial, and Mixed-Use Buildings*". 2023

TABLES

1. Communication Testing Results

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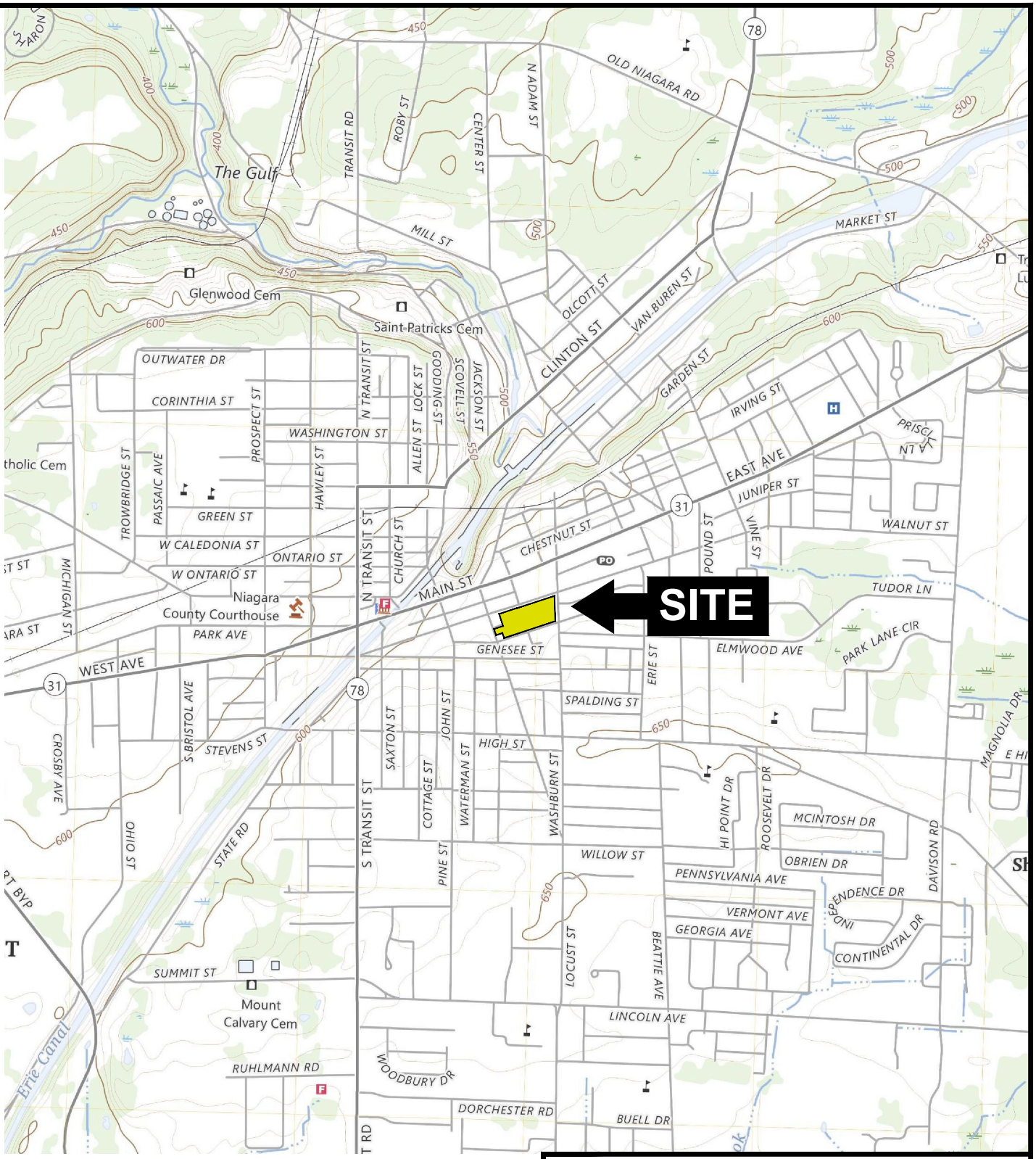
Table 1
Sub-Slab Communication Testing Results
Preliminary ASD System Design
Harrison Place Site

Vacuum Point	Vacuum Monitoring Point	Distance (ft)	Manometer Reading (in of H2O)	Fan Vacuum (in of H2O)	Direction
VP-1	MP-1	10	-0.057	-2.25	NW
VP-1	MP-2	30	-0.004	-2.25	W
VP-1	MP-3	33	-0.032	-2.25	E
VP-1	MP-4	30	-0.028	-2.25	NW
VP-1	MP-5	55	-0.013	-2.25	E
VP-1	MP-6	60	0	-2.25	W
VP-1	MP-7	35	-0.002	-2.25	S
VP-2	MP-8	30	-0.03	-2.25	W
VP-2	MP-9	30	-0.002	-2.25	S
VP-2	MP-10	30	-0.013	-2.25	E
VP-2	MP-11	30	-0.065	-2.25	N
VP-2	MP-12	30	-0.002	-2.25	S
VP-1	MP-1	10	-0.078	-4.4	NW
VP-1	MP-2	30	-0.007	-4.4	W
VP-1	MP-3	33	-0.021	-4.4	E
VP-1	MP-4	30	-0.005	-4.4	NW
VP-1	MP-5	55	-0.0017	-4.4	E
VP-1	MP-6	60	0	-4.4	W
VP-1	MP-7	35	-0.006	-4.4	S
VP-2	MP-8	30	-0.05	-4.4	W
VP-2	MP-9	30	-0.004	-4.4	S
VP-2	MP-10	30	-0.025	-4.4	E
VP-2	MP-11	30	-0.085	-4.4	N
VP-2	MP-12	30	-0.004	-4.4	S

FIGURES

1. Site Location and Vicinity Map
2. Site Plan (Aerial)
3. BCP Project Schedule
4. Communication Testing Locations
5. ASD System Design Layout
6. Typical ASD System Schematic Detail



QUADRANGLE LOCATION

SOURCE:
USGS, 2023, LOCKPORT, NY
7.5 MINUTE TOPOGRAPHIC QUADRANGLE

Title:

SITE LOCATION & VICINITY MAP

ASD SYSTEM WORK PLAN

HARRISON PLACE SITE
BCP SITE NO. C932177
LOCKPORT, NEW YORK

Prepared for:
KEARNEY REALTY & DEVELOPMENT GROUP, INC.

ROUX

Compiled by:	Date: NOVEMBER 2023	FIGURE
Prepared by: CNK	Scale: AS SHOWN	1
Project Mgr: LER	Project: 0684-022-001	
File: FIGURE 1; SITE VICINITY AND LOCATION MAP.DWG		

F:\CAD\0-ROUX\KEARNEY\210 WALNUT ST\ASD WORK PLAN\FIGURE 1; SITE VICINITY AND LOCATION MAP.DWG

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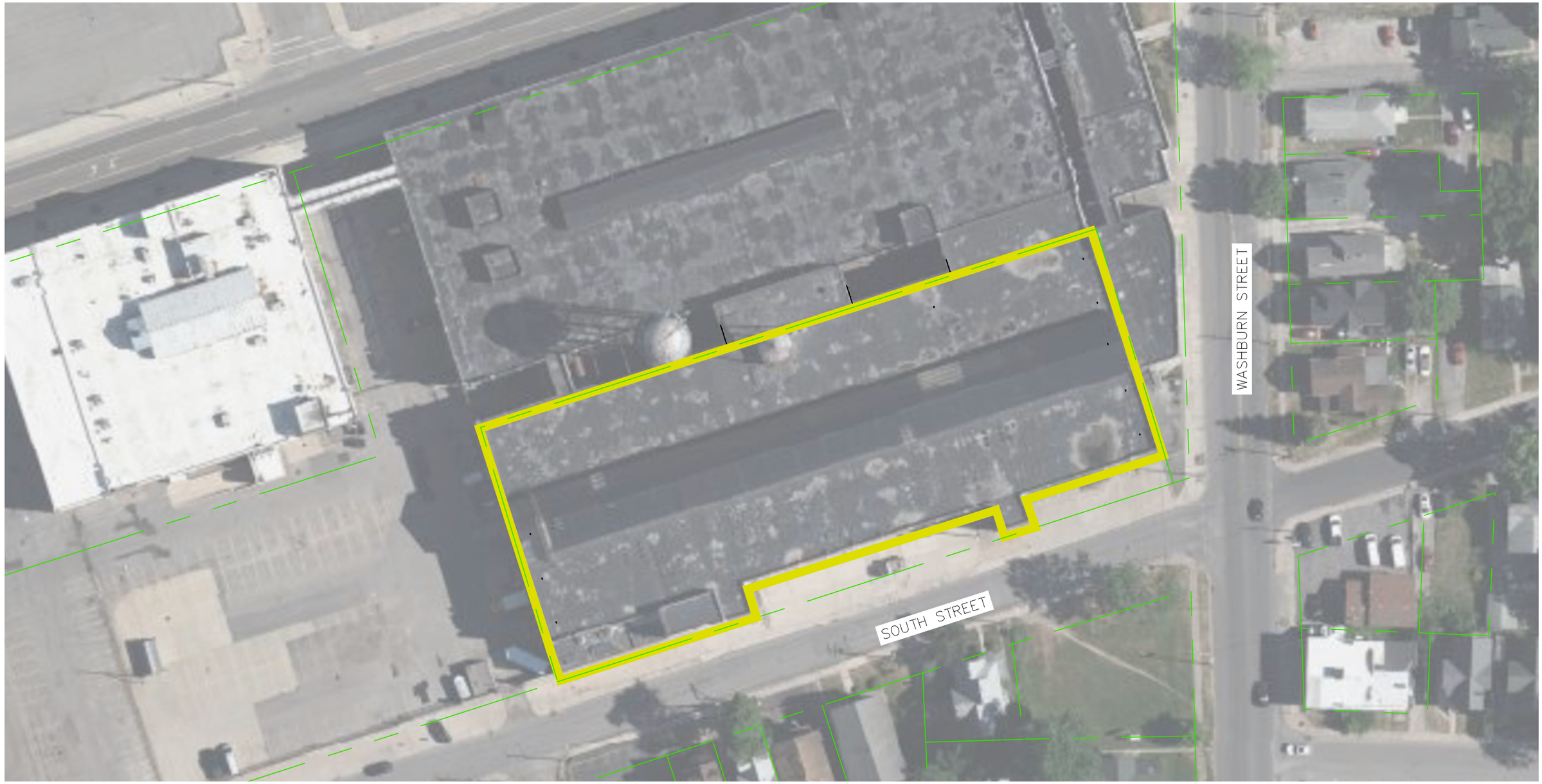

LEGEND:

BCP SITE BOUNDARY

PARCEL BOUNDARY

N

60' 0 60'

Title:

SITE PLAN (AERIAL)

ASD WORK PLAN

HARRISON PLACE SITE

BCP SITE NO. C9332177
LOCKPORT, NEW YORK

Prepared for:
KEARNEY REALTY & DEVELOPMENT GROUP, INC.

ROUX

Compiled by:	Date: AUGUST 2024	FIGURE
Prepared by: CMC	Scale: AS SHOWN	2
Project Mgr: LER	Project:	
File: FIGURE 2; SITE PLAN (AERIAL).DWG		

F:\CAD\0-ROUX\KEARNEY\210 WALNUT ST\ASD WORK PLAN\FIGURE 2; SITE PLAN (AERIAL).DWG

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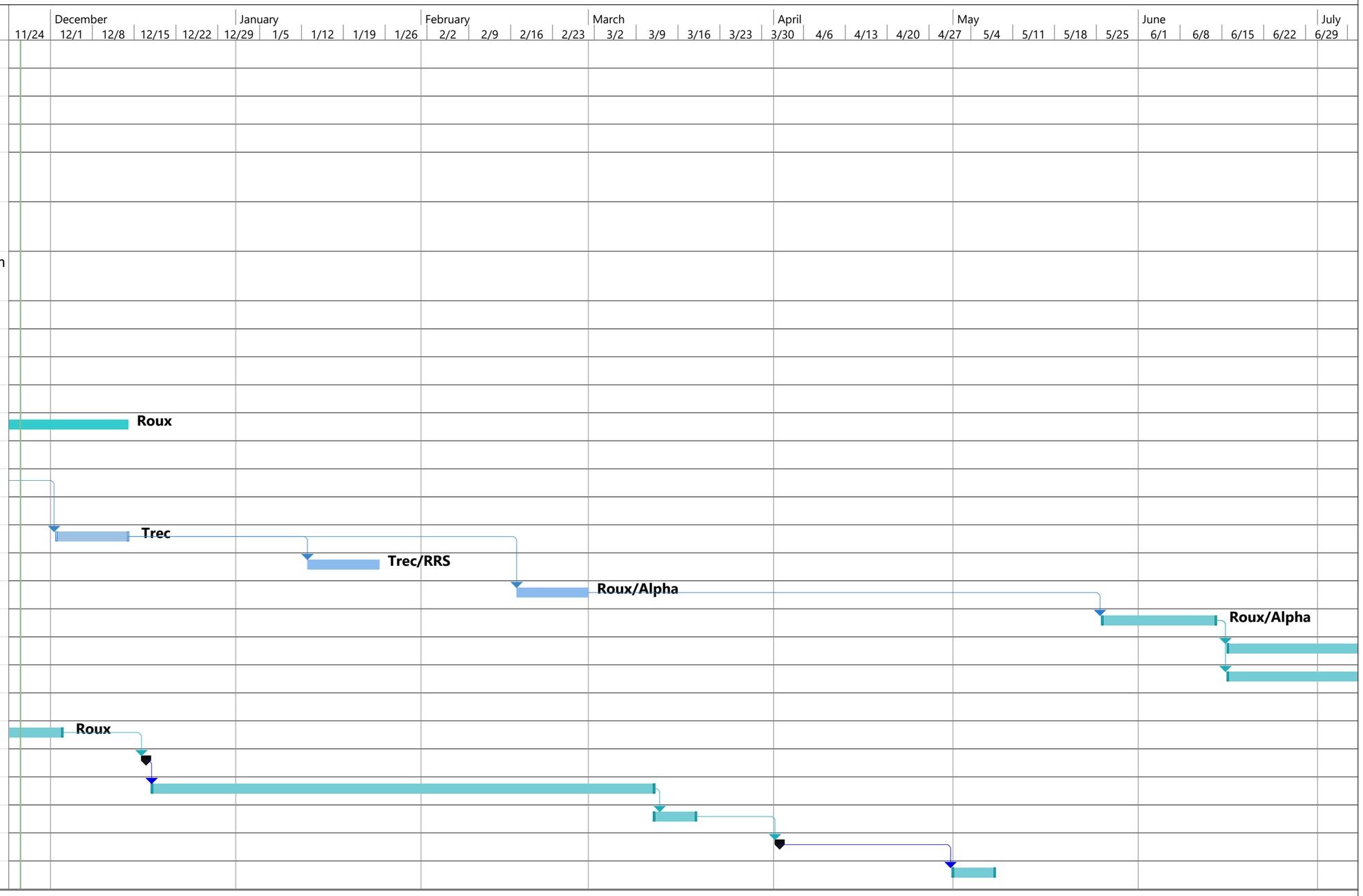
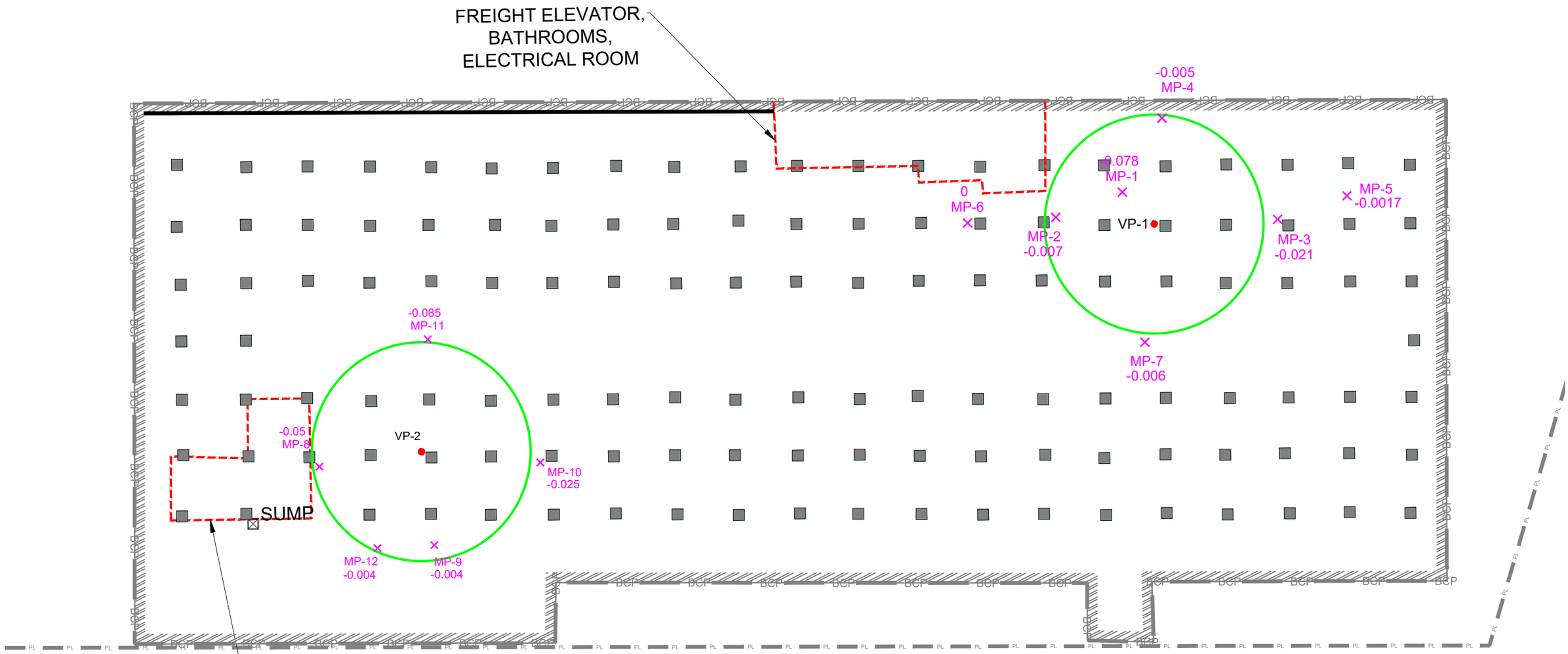
Figure 3
BCP Project Schedule

ID	Task Name
1	GPR Survey
2	Install/Remove Tracers
3	Tracer data collection + analytical review
4	Finalize/Execute Construction Contract
5	Collect/Analyze Soil Sample for Waste Characterization
6	Waste Profile Application & Contained-In Determination (if needed)
7	Install well cluster , temp well & bedrock injection points (full mast)
8	Dewatering Basement
9	Collect/Analyze GW samples (pre-remedial)
10	Decomm. MW-2
11	Injections - Overburden
12	Area A - PersulfOx Mixing/Exc/Bkfl
13	Install MW-1R, MW-2R, MW-3R, MW-7
14	Install bedrock injection points (short mast)
15	Collect/Analyze Overburden GW
16	Injections - Bedrock
17	Install Plume Stop Barrier
18	Collect/Analyze Bedrock GW
19	Collect/Analyse Full Round GW Samples
20	Prepare Site Management Plan
21	Prepare Final Engineering Report
22	
23	Revise and Submit ASD System Work Plan
24	NYSDEC/NYSDOH Approves Work Plan
25	Install ASD System
26	Post-Installation Communication Testing
27	Submit field testing results to DEC/DOH
28	Indoor air testing (once building enclosed)



Project: Harrison Place Remedia
Date: Tue 11/26/24

Task	Project Summary	Manual Task	Start-only	Deadline	
Split	Inactive Task	Duration-only	Finish-only	Progress	
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress	
Summary	Inactive Summary	Manual Summary	External Milestone		



LEGEND:

PL PL	PROPERTY BOUNDARY
BCP BCP	BCP SITE BOUNDARY
SUMP ⊠	BASEMENT SUMP
VP-2 ●	SUB-SLAB COMMUNICATION VACUUM POINT
MP-1 -0.078 ×	SUB-SLAB COMMUNICATION MONITORING POINT WITH MANOMETER READING TAKEN AT -4.4 FAN VACUUM
○	ESTIMATED RADIUS OF INFLUENCE (ROI) TO ACHIEVE A MINIMUM VACUUM OF -0.004 in. w.c.

N

30' 0 30'

Title:

SUB-SLAB COMMUNICATION TEST LOCATIONS

ASD WORK PLAN

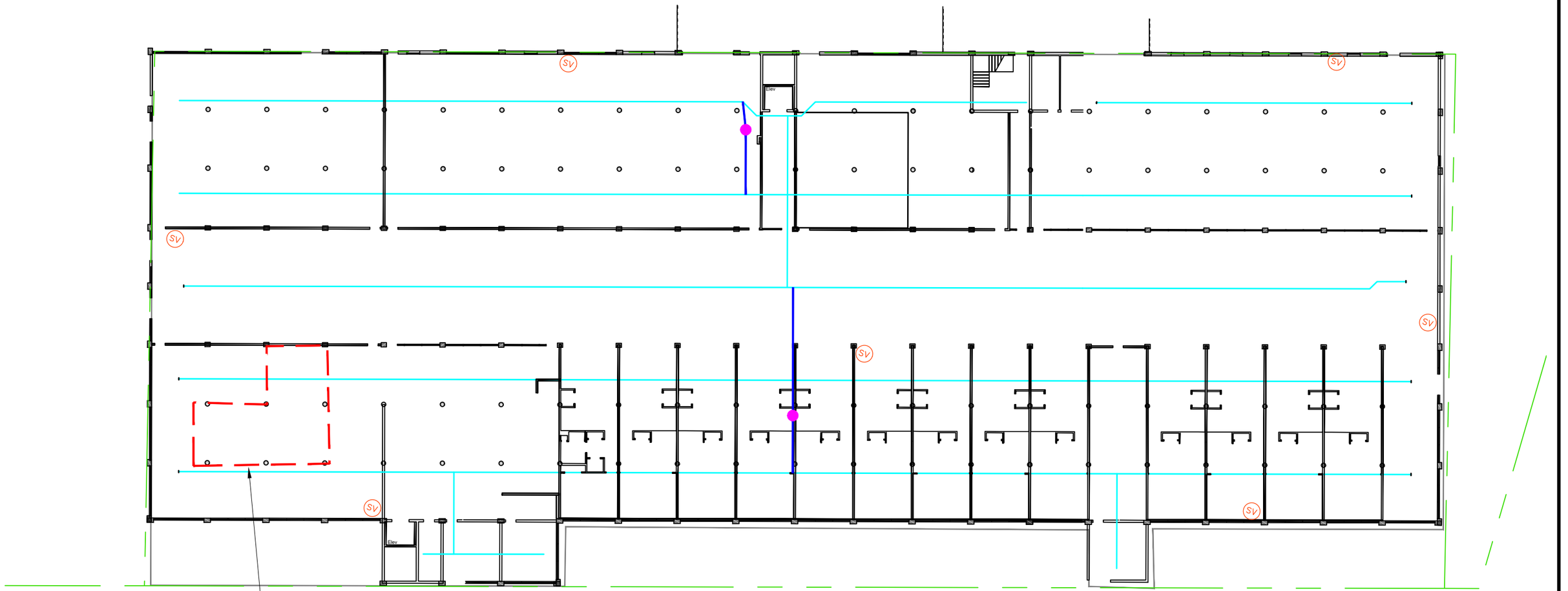
HARRISON PLACE SITE (BCP SITE NO. C9332177)
LOCKPORT, NEW YORK

Prepared for:
KEARNEY REALTY & DEVELOPMENT GROUP, INC.

ROUX

Compiled by:	Date: OCTOBER 2023	FIGURE
Prepared by: CMC	Scale: AS SHOWN	4
Project Mgr: LER	Project: 0684-022-001	
File: FIGURE 4; COMMUNICATION FIELD RESULTS REV.DWG		

F:\CAD\0-ROUX\KEARNEY\210 WALNUT ST\ASD WORK PLAN\FIGURE 4; COMMUNICATION FIELD RESULTS REV.DWG



LEGEND:

- PROPOSED ASD RISER PIPE LOCATION
- OVERHEAD CONNECTION PIPE RUNS TO ASD RISER
- ASD SUBSLAB TRENCHING & PIPE LOCATION
- SV PROPOSED PERMANENT SAMPLING PORT LOCATION

30' 0 30'

Title:

ASD SYSTEM LAYOUT

ASD WORK PLAN

HARRISON PLACE SITE
BCP SITE NO. C9332177
LOCKPORT, NEW YORK

Prepared for:
KEARNEY REALTY & DEVELOPMENT GROUP, INC.

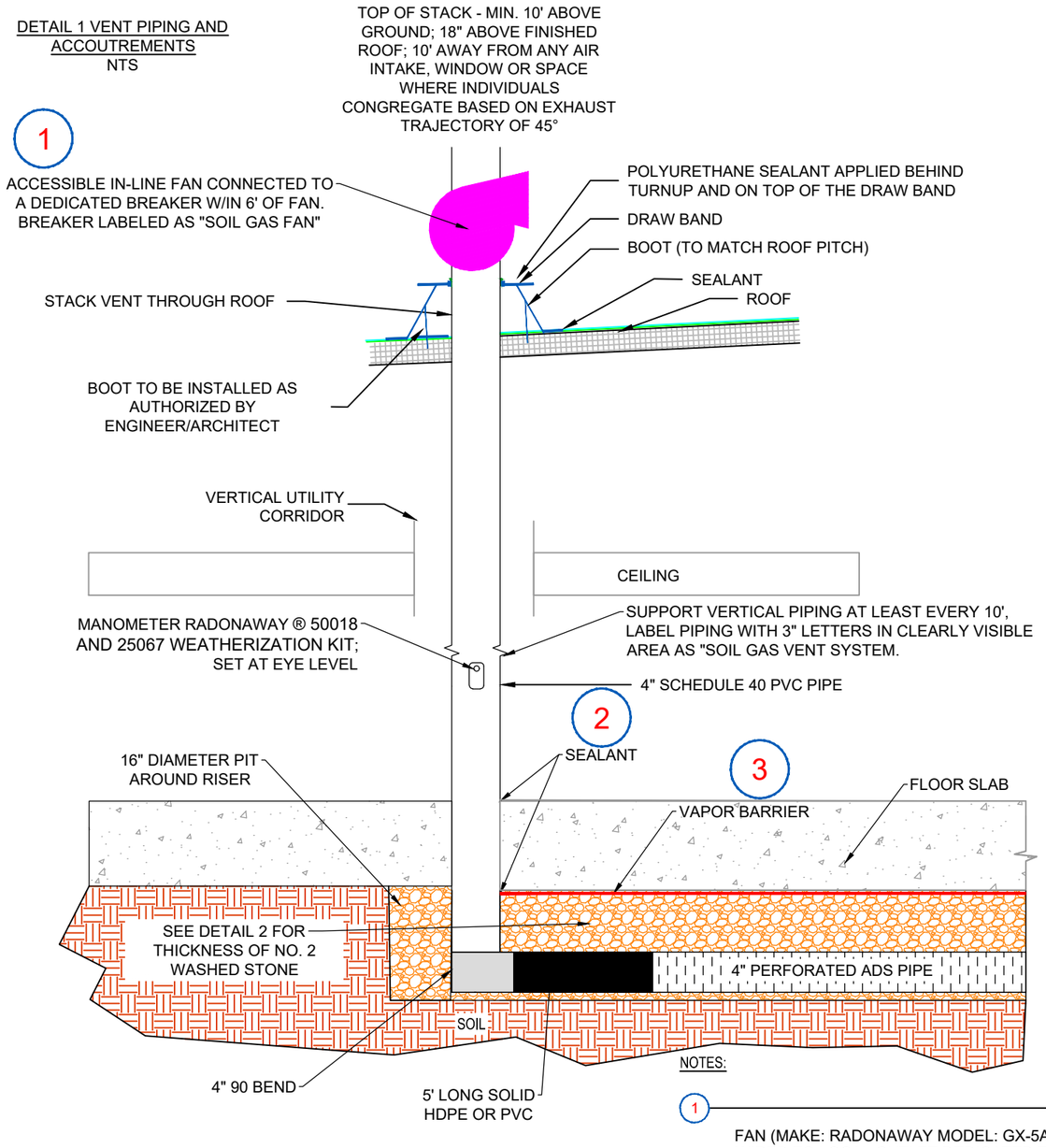
ROUX

Compiled by:	Date: AUGUST 2024	FIGURE
Prepared by: CMC	Scale: AS SHOWN	5
Project Mgr: LER	Project:	
File: FIGURE 5; ASD DESIGN LAYOUT REV.DWG		

F:\CAD\0-ROUX\KEARNEY\210 WALNUT ST\ASD WORK PLAN\FIGURE 5; ASD DESIGN LAYOUT REV.DWG

F:\CAD\0-ROUX\Kearney\210 Walnut St\ASD Work Plan\Figure 5; ASD Design Layout rev.dwg, 11/22/2024 3:04:32 PM, DWG To PDF.pc3

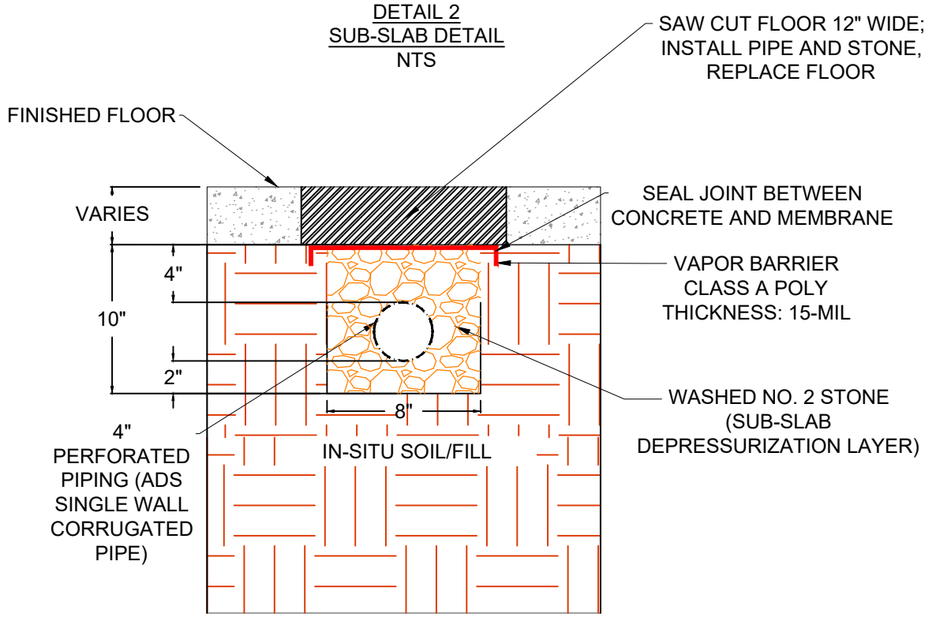
DETAIL 1 VENT PIPING AND ACCOUTREMENTS
NTS



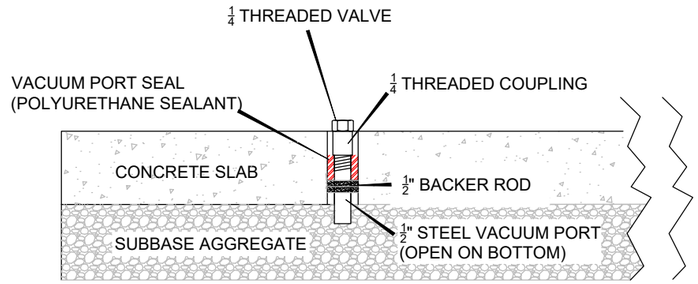
NOTES:

1. FAN (MAKE: RADONAWAY MODEL: GX-5A-4), WIRED TO LOCAL OUTLET DEDICATED TO THE FAN OPERATION AND LABELED AS SUCH.
2. POLYURETHANE SEALANT APPLIED IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS TO SEAL ALL GAPS. USE OF SILICONE SEALANTS IS PROHIBITED.
3. VAPOR BARRIER 15-MIL POLYOLEFIN SHEETING (PERMINATOR® OR SIMILAR).

DETAIL 2
SUB-SLAB DETAIL
NTS



DETAIL 3
PERMANENT VAPOR MONITORING PORT
NTS



Title:
PLANNED SUBSLAB PIPING EXISTING BUILDING-DETAILS
ASD WORK PLAN

HARRISON PLACE SITE (BCP SITE NO. C932177)
LOCKPORT, NEW YORK

Prepared for:
KEARNEY REALTY & DEVELOPMENT GROUP, INC.

ROUX

Compiled by: RFL	Date: AUGUST 2024	FIGURE
Prepared by: RFL/CMC	Scale: AS SHOWN	
Project Mgr: MAL	Project: 4353.0001B004	6
File: FIGURE 6; ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS.DWG		

F:\CAD\0-ROUX\KEARNEY\210 WALNUT ST\ASD WORK PLAN\FIGURE 6; ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS.DWG

APPENDICES

A. ASD System Product Information

B. Civil Construction Drawings

APPENDIX A

ASD System Product Information

RadonAway®

The world's leading radon fan manufacturer

GX5A Pro Series Fan Installation Instructions

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. RadonAway.com/vapor-intrusion

2. **NOTE:** Fan is suitable for use with solid state speed controls; however, use of speed controls is not generally recommended.

2. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

3. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

4. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   Do NOT attempt to open. Return unit to the factory. (See Warranty, p. 7, for details.)

5. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

6. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer. (See p. 7.)

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturers' guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) protected branch circuit.

Fan Installation & Operating Instructions
GX5A Pro Series Fan

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The GX5A Pro Series Radon Fan is intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of GX Pro Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The GX5A Pro Series Fan is factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The GX5A Pro Series Fan is designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F or more than 100 degrees F.

1.4 ACOUSTICS

The GX5A Pro Series Fan, when installed properly, operate with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

(To ensure quiet operation of inline and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan(s). The GX5A Pro Series Fan is not suitable for kitchen range hood remote ventilation applications.)

1.5 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes, thus blocking air flow to the GX5A Pro Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes, allowing for return to normal operation.

1.6 SLAB COVERAGE

The GX5A Pro Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the Radon Fan best suited for the sub-slab material can improve the slab coverage. The GX5A Fan is best suited for tighter soils where higher suction is needed. Consider using the RP260 where additional airflow is required, and the RP265 and RP380 for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GX5A Pro Series Fan MUST be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GX5A Pro Series Fan is NOT suitable for underground burial.

For GX5A Pro Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*		
	@25 CFM	@50 CFM	@100 CFM
4”	1/8”	1/4”	3/8”
3”	1/4”	3/8”	1 1/2”

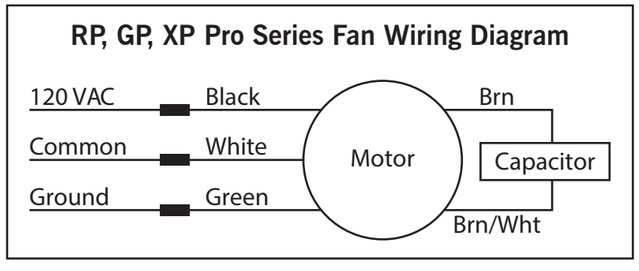
See p. 6 for detailed specifications.

1.8 SYSTEM MONITOR & LABEL

A System Monitor is required to notify the occupants of a fan system malfunction. The GX5A Fan requires a U-tube Manometer >5.5” max. (such as P/N 50036). You may choose to also use an audible alarm (P/N 28001-2, 28001-4, 28421 or 28535). A System Label (provided with Manometers P/N 50036 and 50017) with instructions for contacting the installing contractor for service and identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.9 ELECTRICAL WIRING

The GX5A Pro Series Fan operates on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

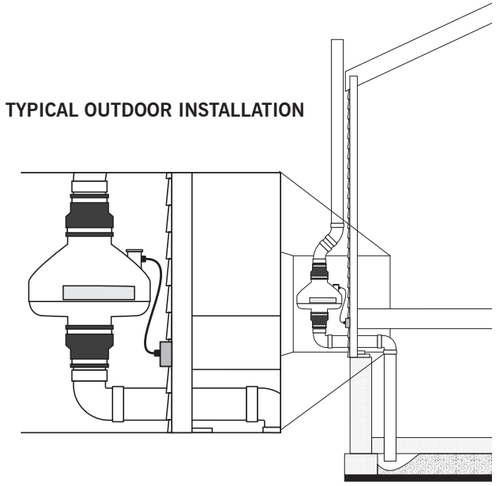


2.0 INSTALLATION

The GX5A Pro Seres Fan can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The GX5A Fan may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.

The ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

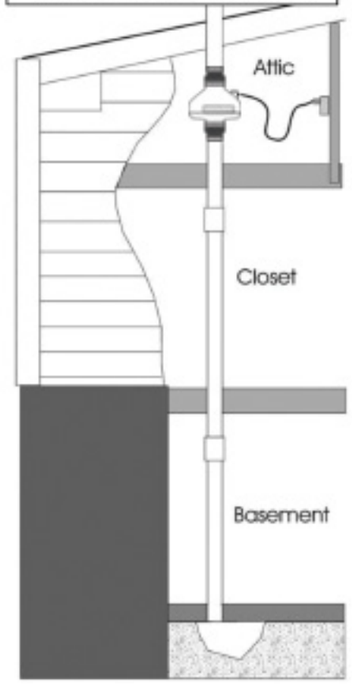
TYPICAL OUTDOOR INSTALLATION



2.1 MOUNTING

Mount the GX5A Pro Series Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

TYPICAL INDOOR INSTALLATION



2.2 MOUNTING BRACKET (optional)

The GX5A Pro Series Fan may be optionally secured with the RadonAway P/N 25007 mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.9). Note that the fan is not intended for connection to rigid metal conduit.

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

_____ **Verify** all connections are tight and **leak-free**.

_____ **Ensure** the GX5A Pro Series Fan and all ducting are **secure and vibration-free**.

_____ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.
(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

THE FOLLOWING CHARTS SHOW THE PERFORMANCE OF THE GX5A PRO SERIES FAN

GX5A PRO SERIES FAN Product Specifications

Typical CFM Vs. Static Pressure "WC						
Model	**0"**	**1.0"**	**2.0"**	**3.0"**	**4.0"**	**5.0"**
GX5A	174	150	121	**87**	**50**	**8**

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
GX5A	77-133 watts	5.00" WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet	L.2
GX5A	11.1"H x 11.9" Dia.	9 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2" WC pressure loss (see CFM Vs Static Pressure "WC Table).

GX5A Pro Series Fan Additional Specifications

Model	Recommended Duct	PVC Pipe Mounting	Thermal Cutout	Insulation Class
GX5A	3" or 4" Schedule 20/40 PVC	Mount on the duct pipe or with optional mounting bracket. For Ventilation: 4", 6" or 8" Rigid or Flexible Ducting.	150°C/302°F	Class F Insulation

Continuous Duty
3000 RPM
Thermally Protected
Residential and Commercial
Rated for Indoor or Outdoor Use

LISTED
Electric Fan

Intertek
77728

Conforms to
UL STD. 507
Certified to
CAN/CSA STD.
C22.2 No.113

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RadonAway® GX5A Pro Series Fan for shipping damage within 15 days of receipt. **Notify RadonAway of any damages immediately.** RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open the housing.** Return unit to factory. (See Warranty below).

Install the GX Pro Series Fan in accordance with all EPA, ANSI/AARST standard practices, and state and local building codes and regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

Warranty

RadonAway® warrants that the GX5A Pro Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner (the "Warranty Term").

RadonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway®.

The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

5-YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to 60 months (5 years) from date of purchase or 66 months from date of manufacture, whichever is sooner, provided that the fan is installed by a professional radon mitigation contractor. Proof of purchase and/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the Continental United States and Canada beyond the standard 12 months from the date of purchase or18 months from the date of manufacture, whichever is sooner.

RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE GX5A PRO SERIES FAN IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULARPURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including insurance, to and from factory.

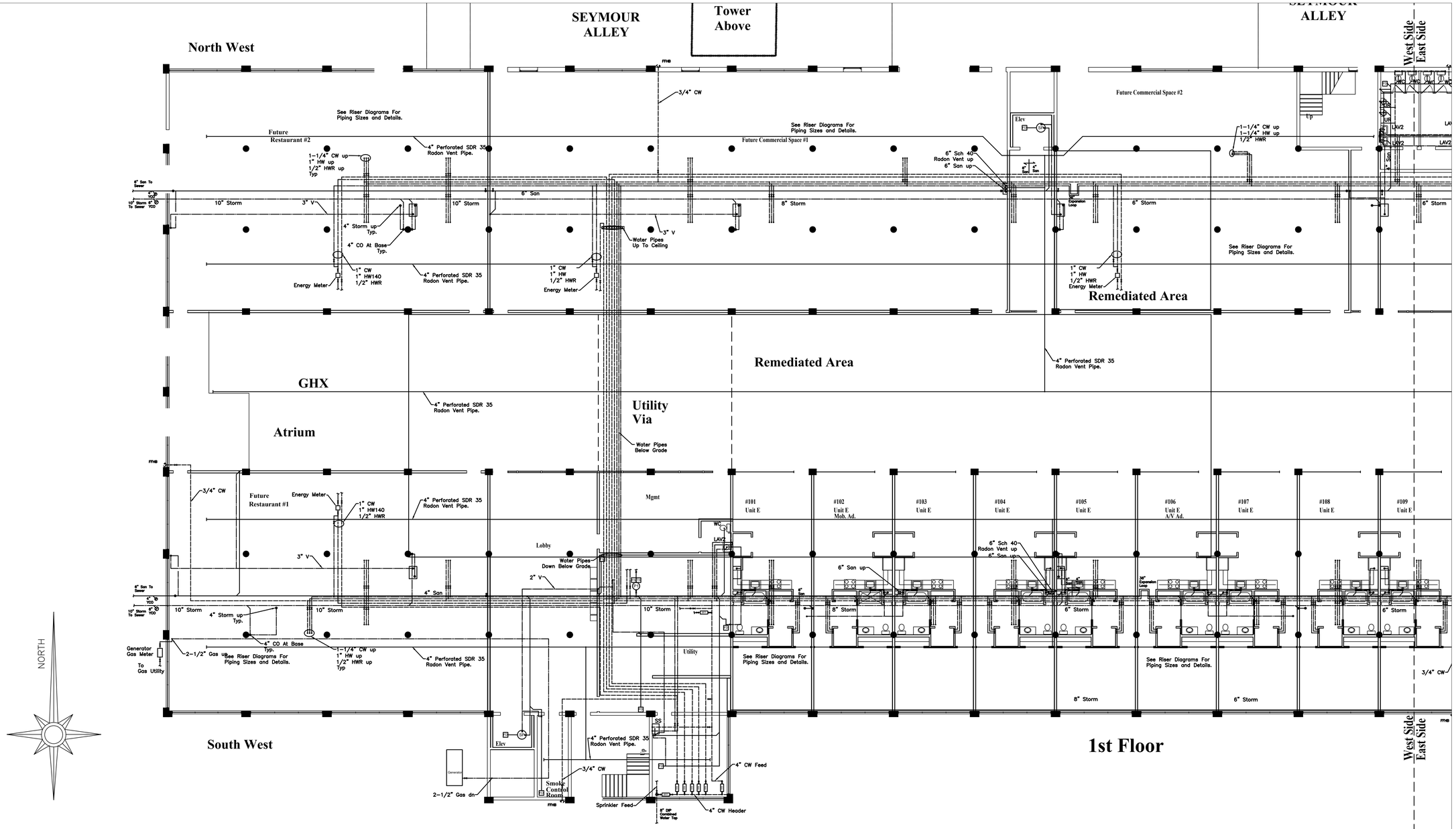
RadonAway®
3 Saber Way, Ward Hill, MA 01835 USA
TEL (978) 521-3703 FAX (978) 521-3964
Email to: Returns@RadonAway.com

Record the following information for your records:

Serial Number: Purchase Date:

APPENDIX B

Civil Construction Drawings



1 First Floor Plumbing Plan

P-1W Scale: 3/32"=1'-0"

Gilson Engineering And Associates
15 Shea Knolls Ct.
Campbell Hall, NY 10916

Phone 845-496-2642
Fax 845-496-2642
Email delta2@frontiernet.net

John D. Gilson, P.E.
License # NJ GE30589 NY 60816

STATE OF NEW YORK · JOHN D. GILSON · NO. 060815 · LICENSED PROFESSIONAL ENGINEER

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

° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

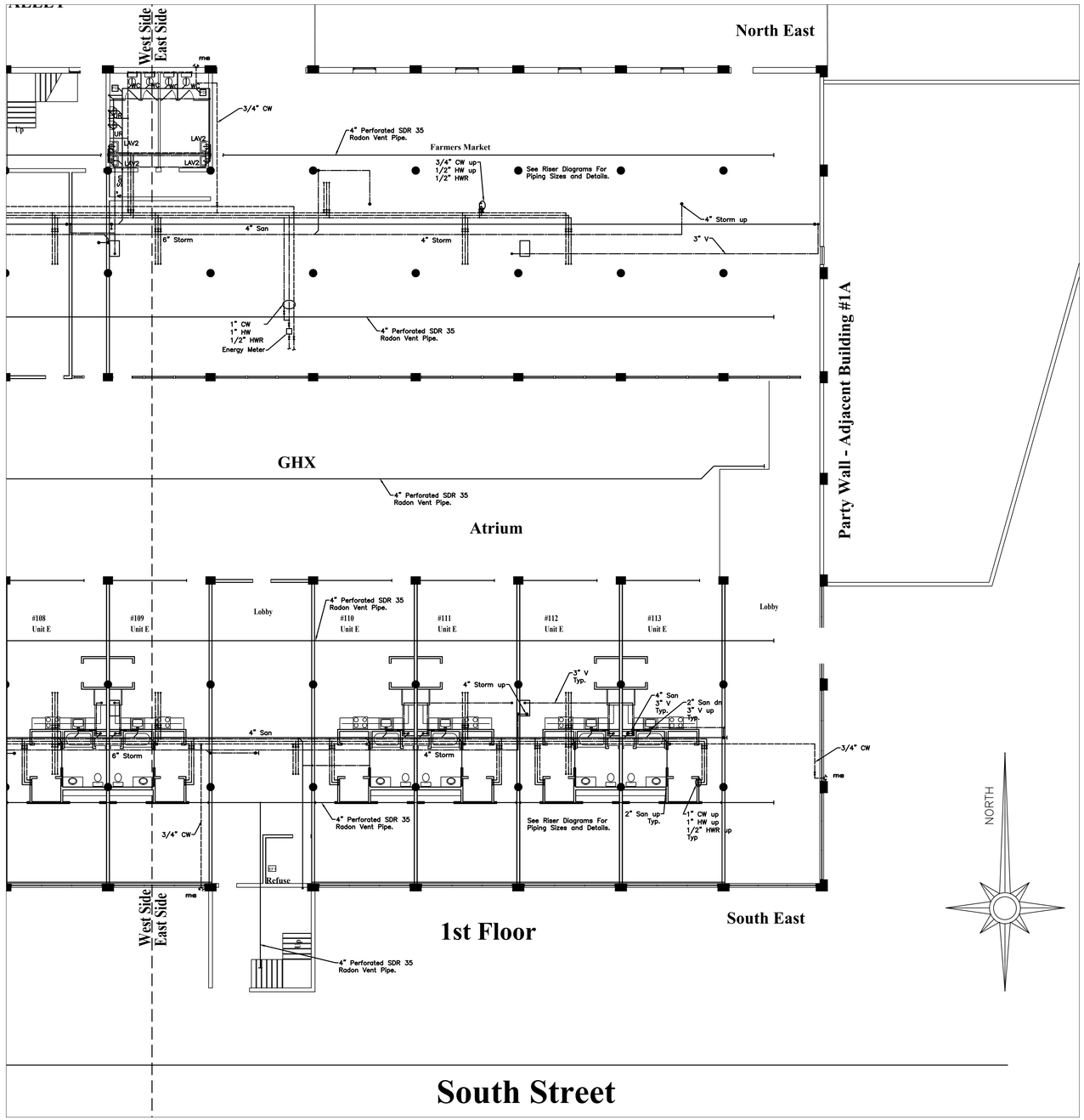
First Floor Plumbing West

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
P-1W



1 P-1E First Floor Plumbing Plan

Scale: 3/32"=1'-0"

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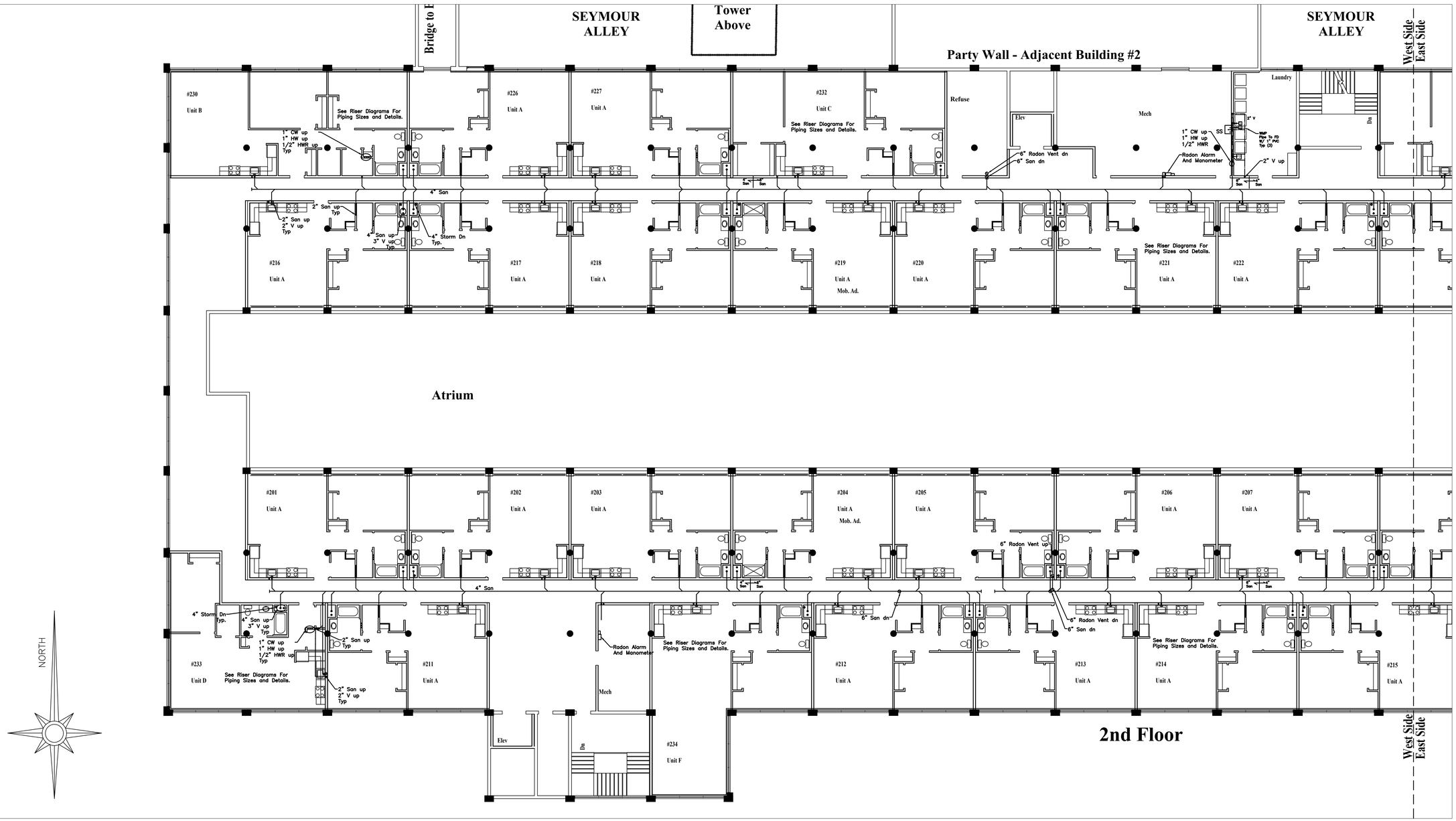

1 P-2W 2nd Floor Plumbing Plan

Scale: 3/32"=1'-0"

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Second Floor Plumbing West

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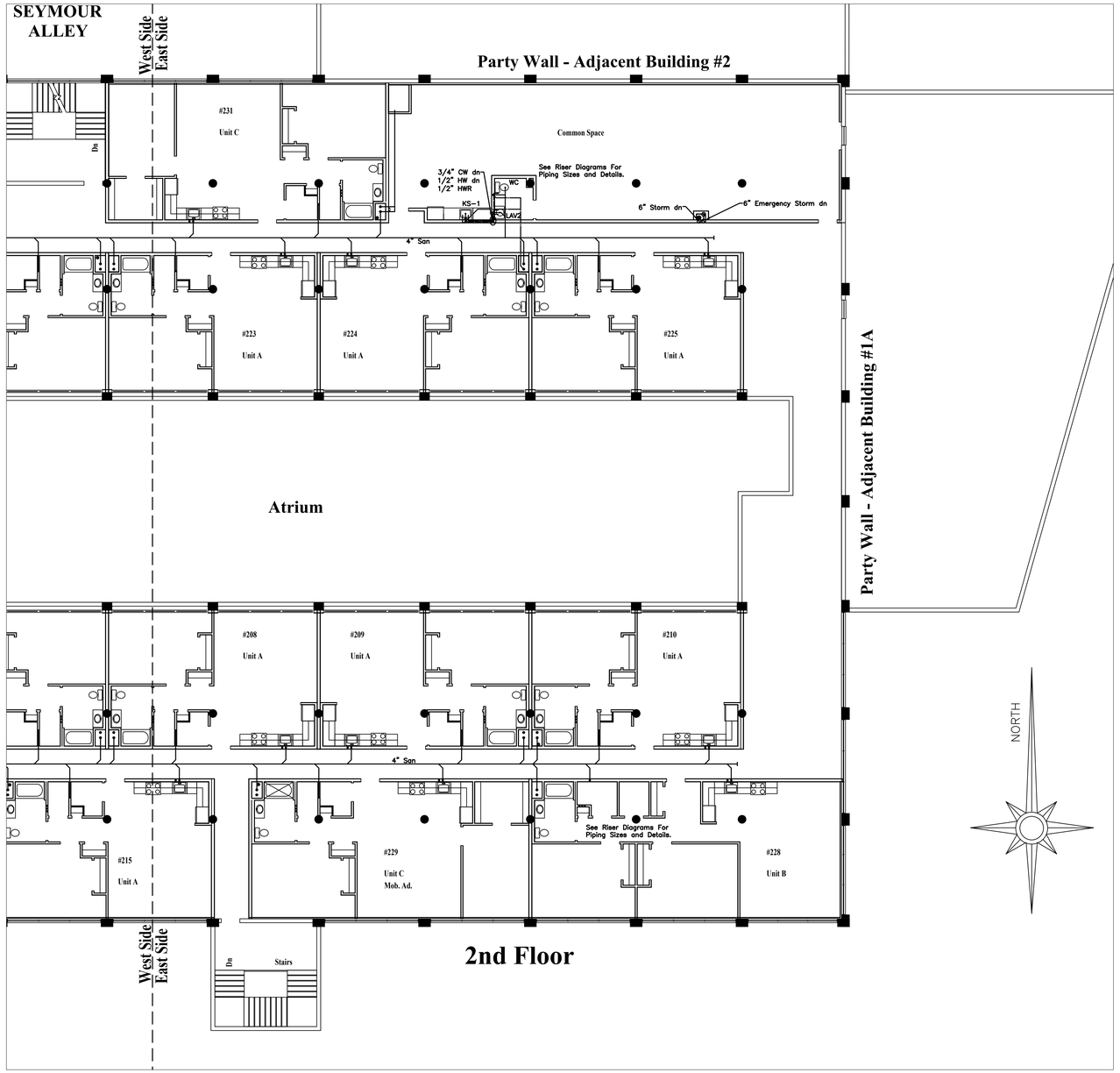
20-30

SHEET NUMBER
P-2W



2nd Floor

1 P-2E Second Floor Plumbing Plan

Scale: 3/32"=1'-0"

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SHEET NUMBER

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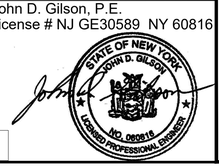

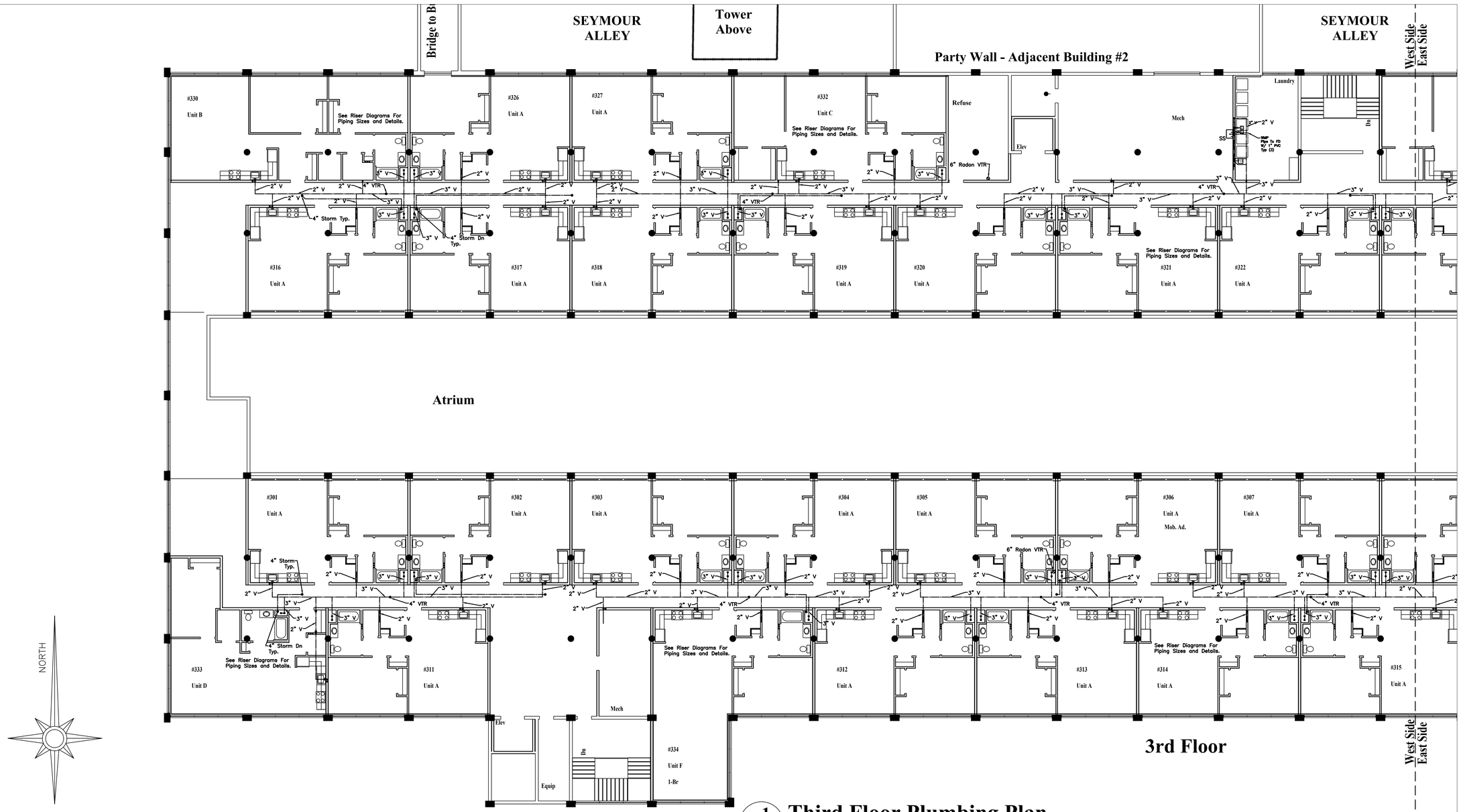

1 Third Floor Plumbing Plan

P-3W Scale: 3/32"=1'-0"

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Harrison Place Lofts

210 Walnut Street,
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Third Floor Plumbing West

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3/11/24

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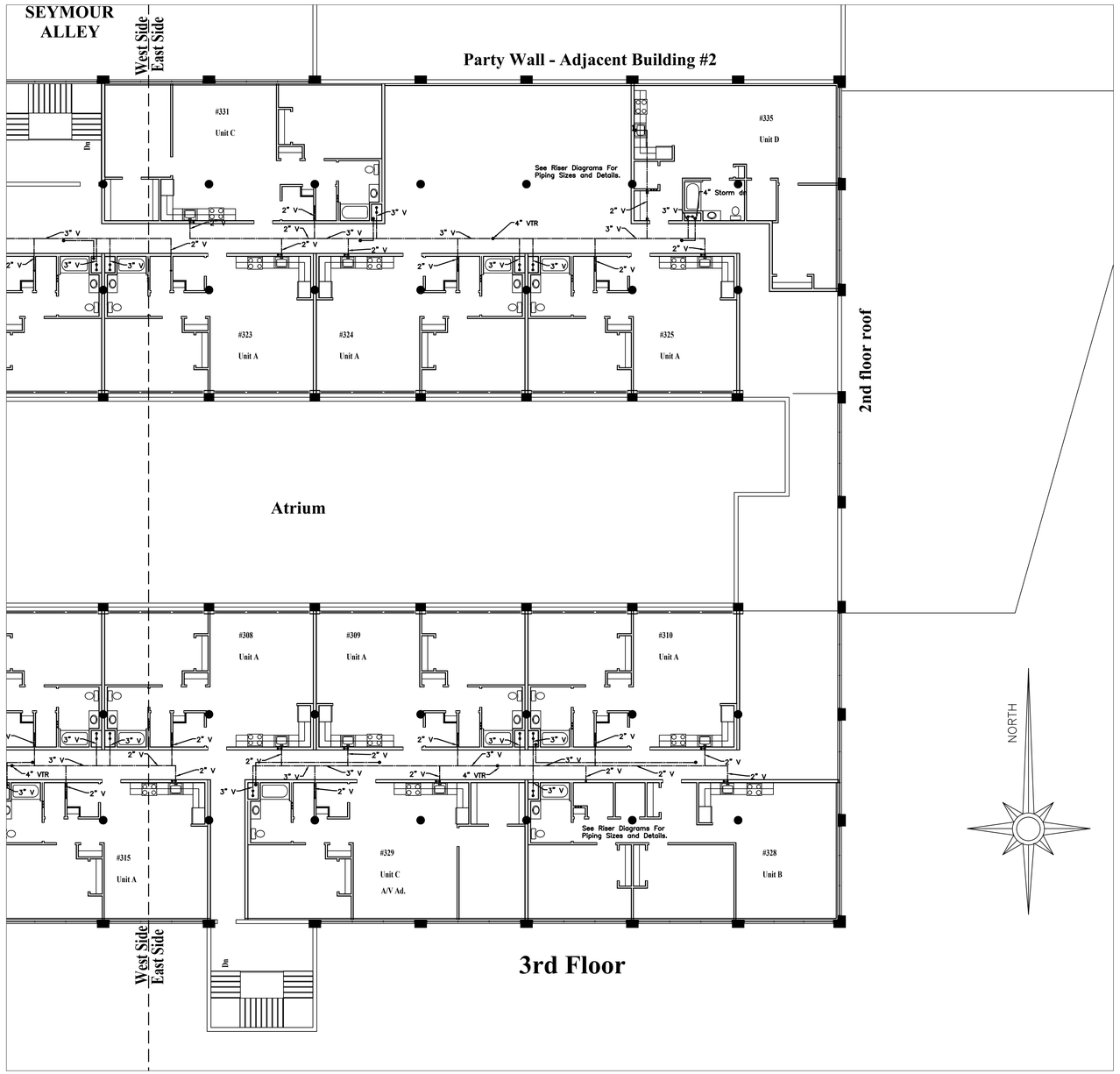

1 P-3E Third Floor Plumbing Plan

Scale: 3/32"=1'-0"

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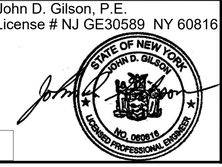

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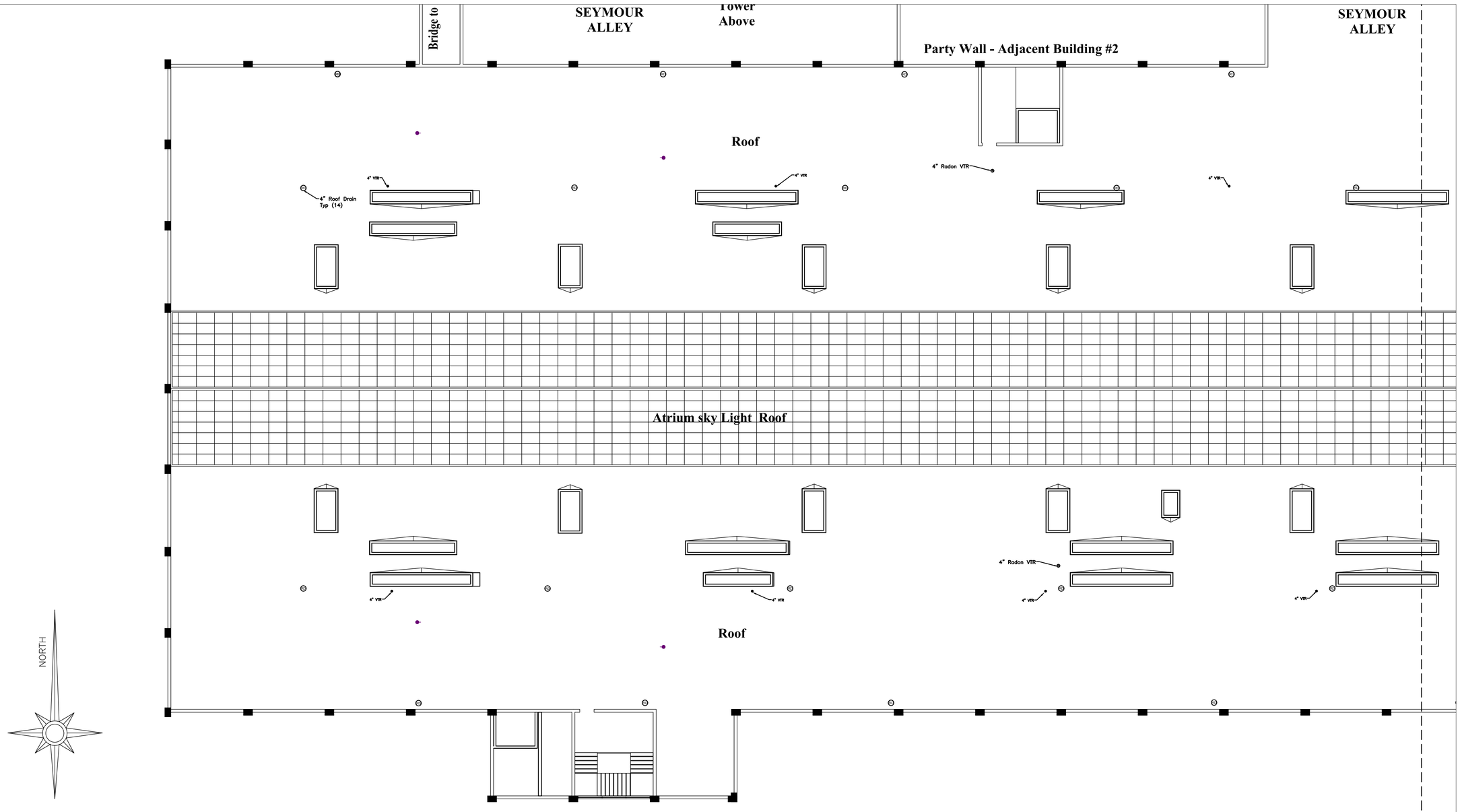

1 Roof Plumbing Plan

P-4W Scale: 3/32"=1'-0"

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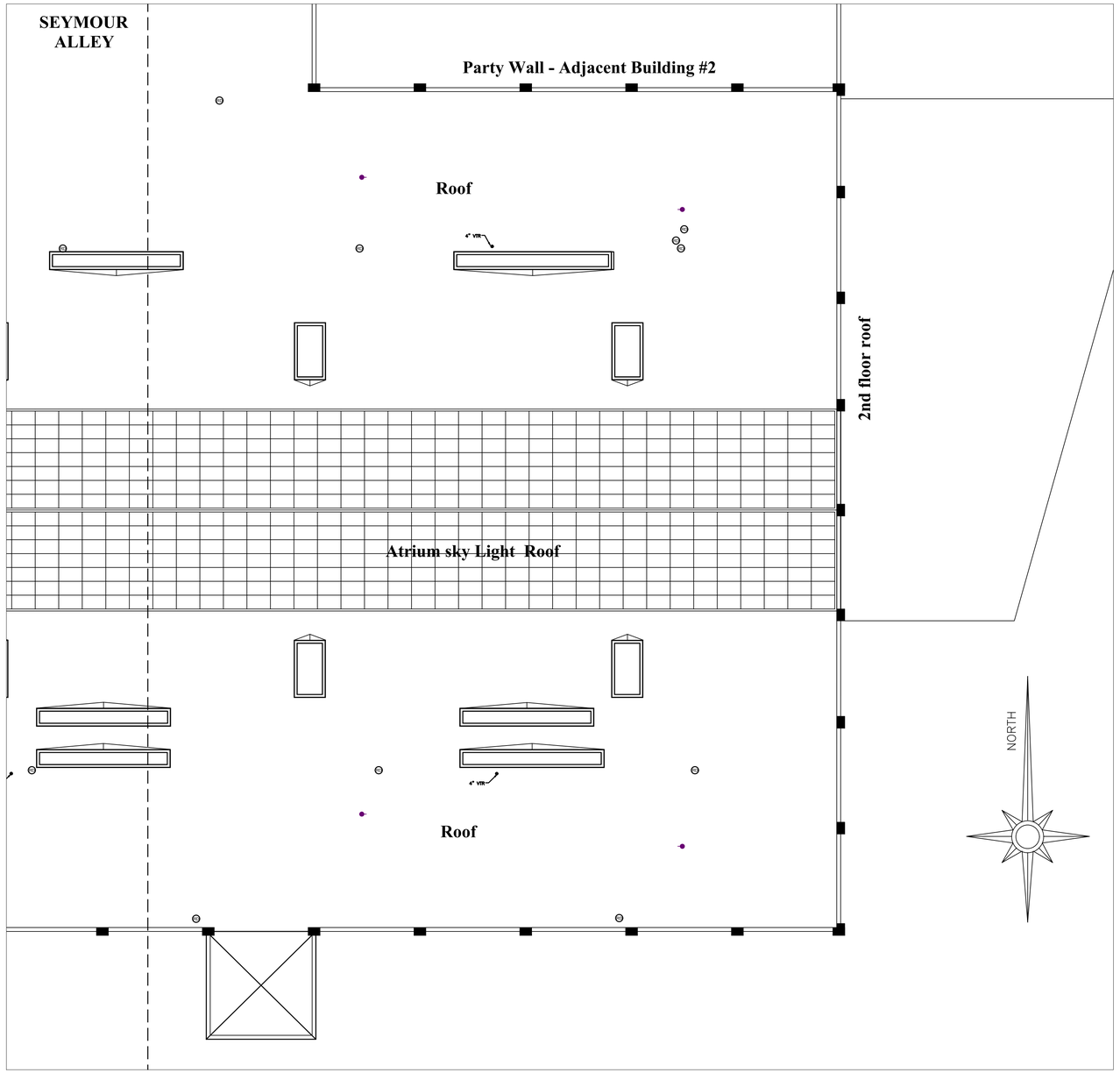
PROJECT NUMBER
19-13

SHEET NUMBER
P-4W



1 P-4E Roof Plumbing Plan

Scale: 3/32"=1'-0"

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ajcoppola@coppola-associates.com

° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

Roof Plumbing East

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
P-4E

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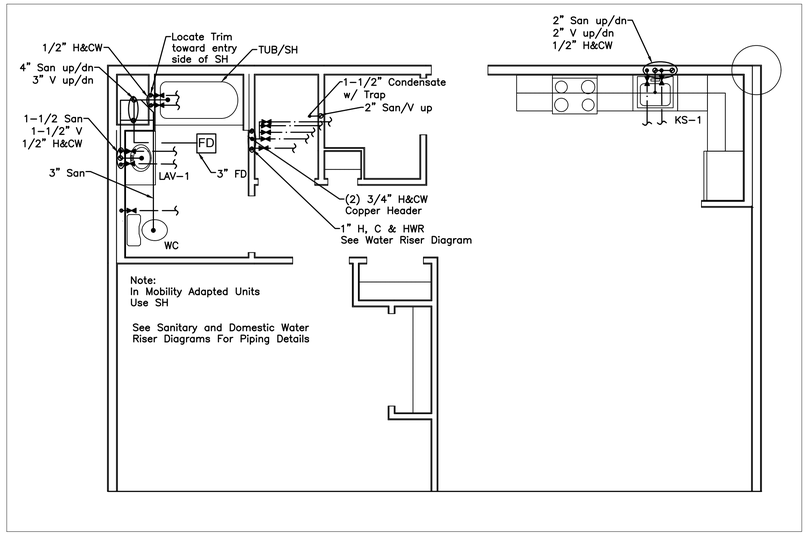
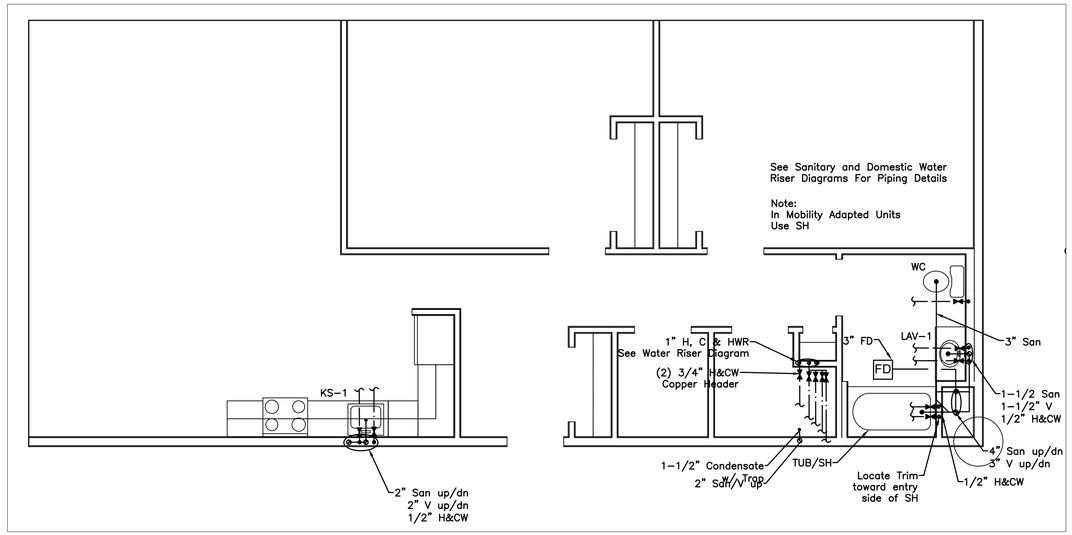
STATE OF NEW YORK JOHN D. GILSON NO. 060816 LICENSED PROFESSIONAL ENGINEER



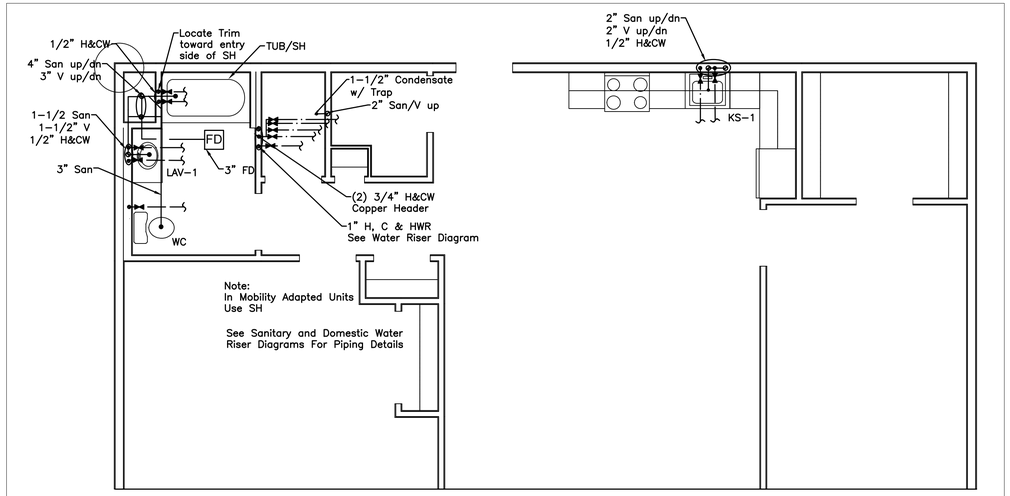
1 P-5 Unit A Plumbing Plan

Scale: 1/4"=1'-0"



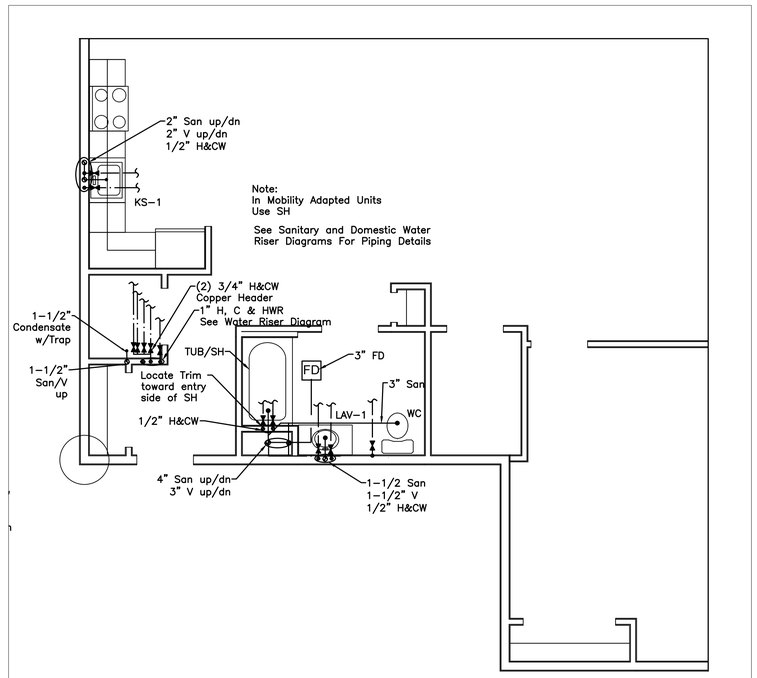
2 P-5 Unit B Plumbing Plan

Scale: 1/4"=1'-0"



3 P-5 Unit C Plumbing Plan

Scale: 1/4"=1'-0"



1 P-5 Unit D Plumbing Plan

Scale: 1/4"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

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210 Walnut Street,
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Typical Unit Plumbing Plans

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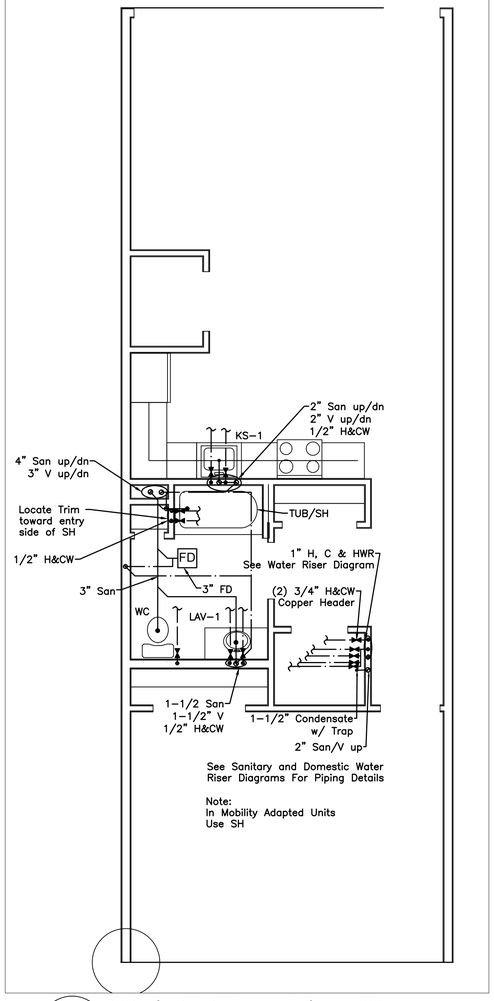
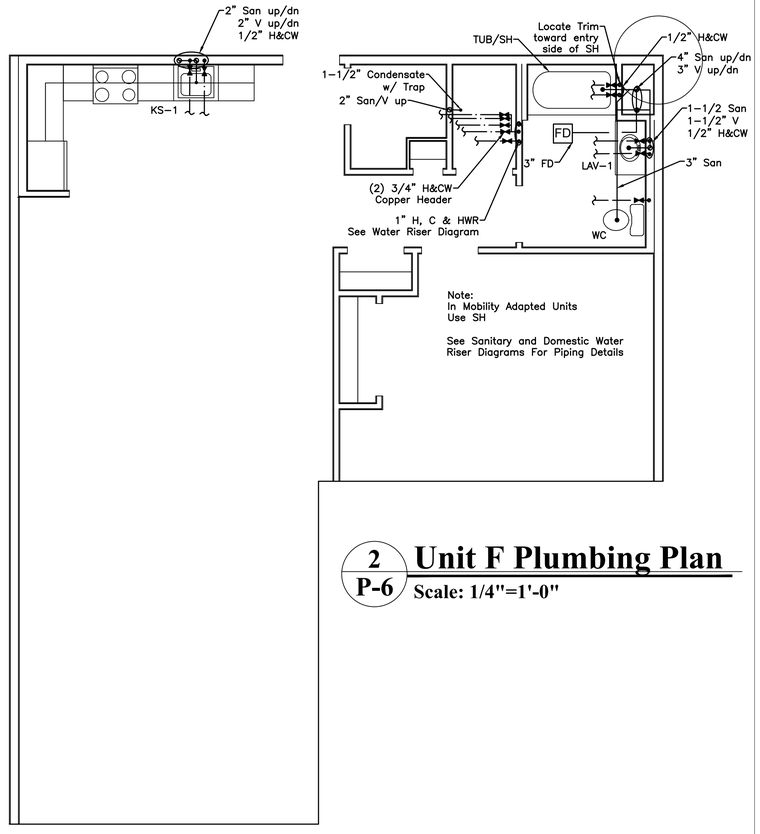


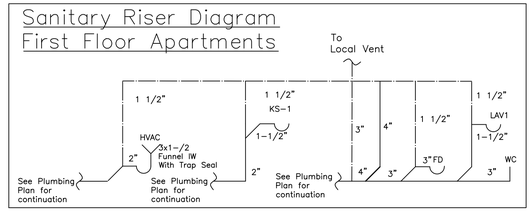
1 P-6 Unit E Plumbing Plan

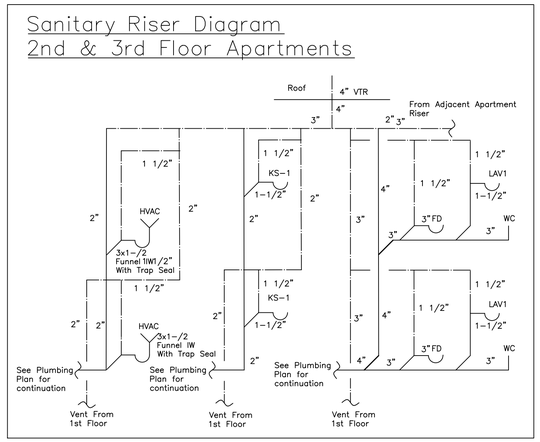
Scale: 1/4"=1'-0"

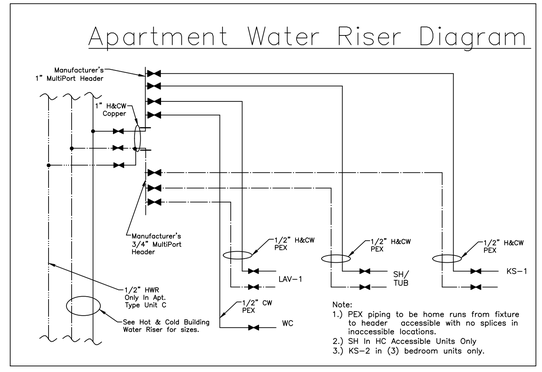


2 P-6 Unit F Plumbing Plan

Scale: 1/4"=1'-0"







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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
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Typical Unit Plumbing Plans And Apartment Riser Diagrams

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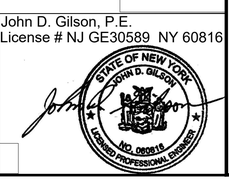
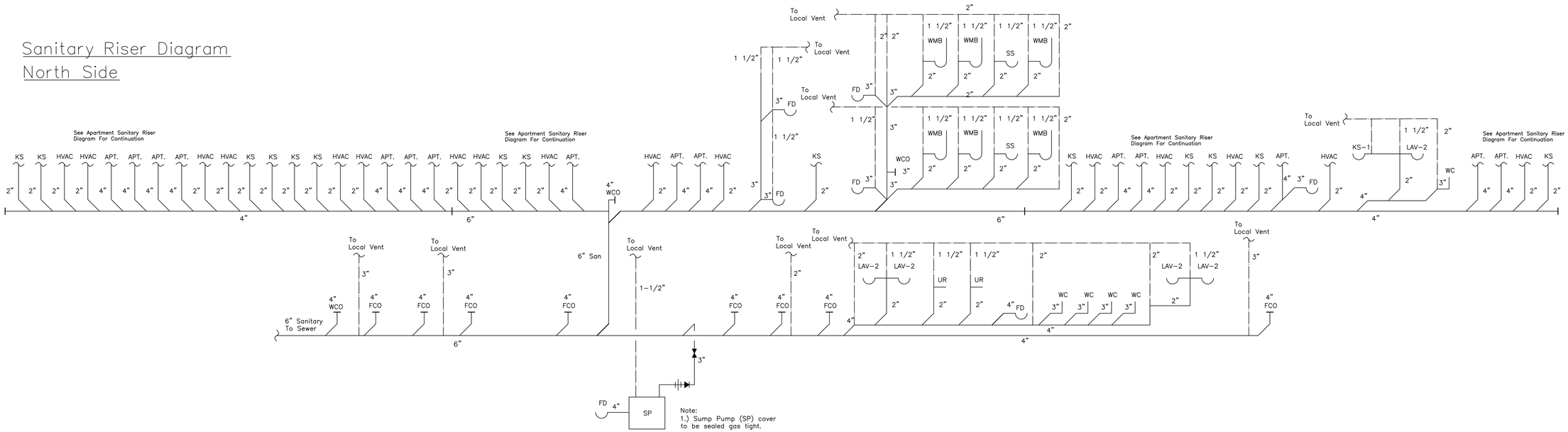
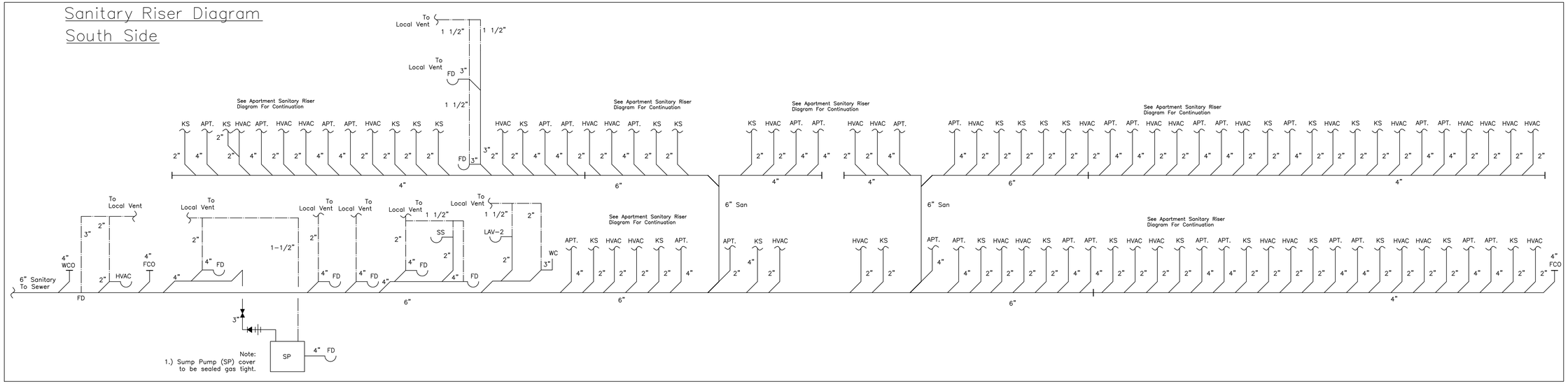


Sanitary Riser Diagram
North Side



Sanitary Riser Diagram
South Side



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Plumbing Sanitary Riser Diagrams

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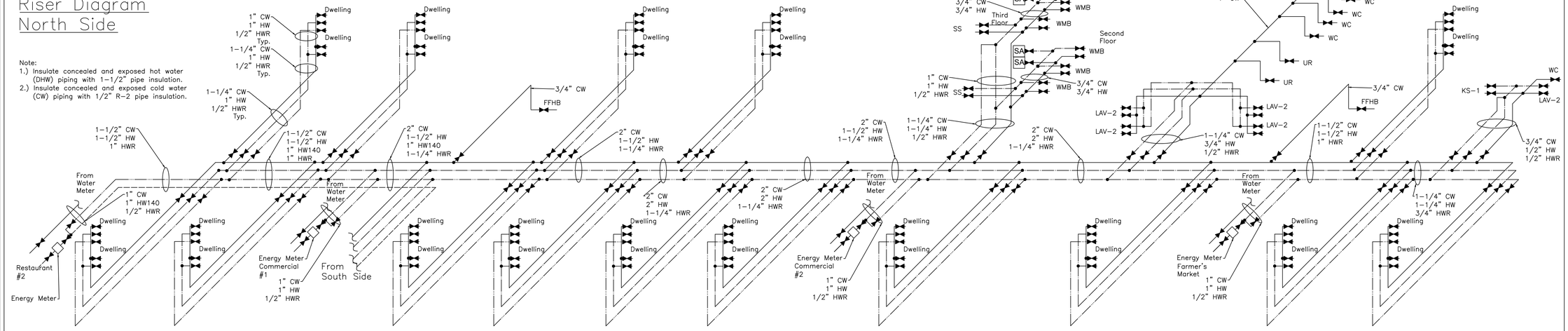
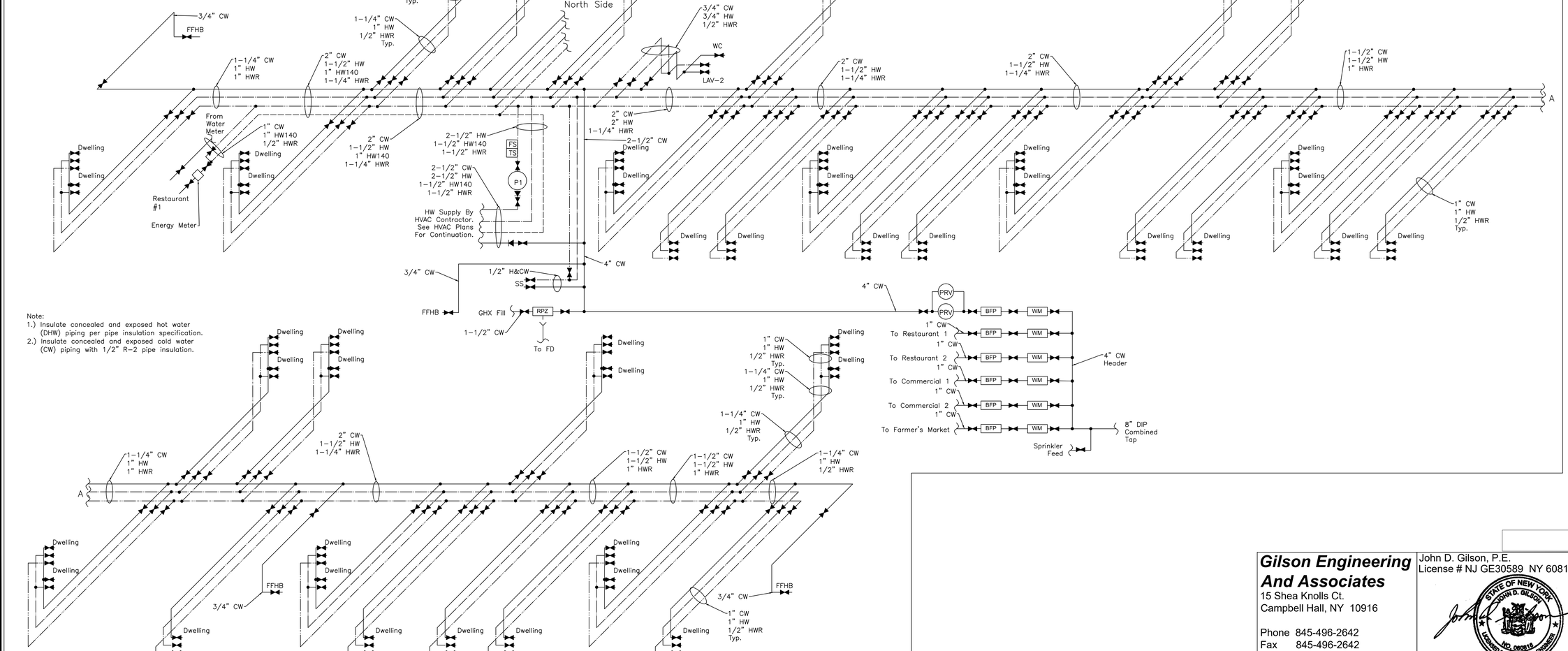
Building Water Riser Diagram North Side

Note:
1.) Insulate concealed and exposed hot water (DHW) piping with 1-1/2" pipe insulation.
2.) Insulate concealed and exposed cold water (CW) piping with 1/2" R-2 pipe insulation.



Building Water Riser Diagram South Side



Note:
1.) Insulate concealed and exposed hot water (DHW) piping per pipe insulation specification.
2.) Insulate concealed and exposed cold water (CW) piping with 1/2" R-2 pipe insulation.

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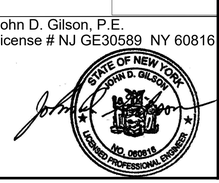

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° PROPOSED MULTIFAMILY DWELLING FOR °

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Plumbing Water Riser Diagrams

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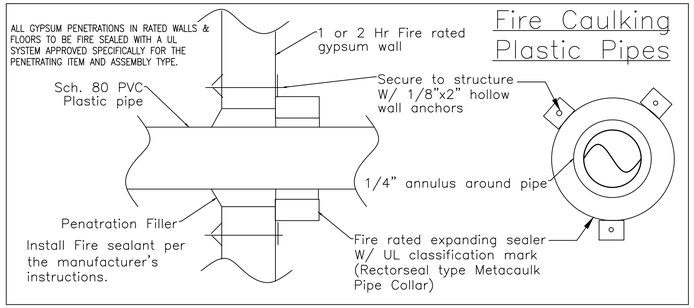
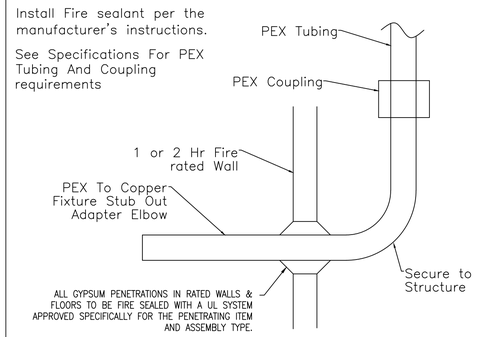
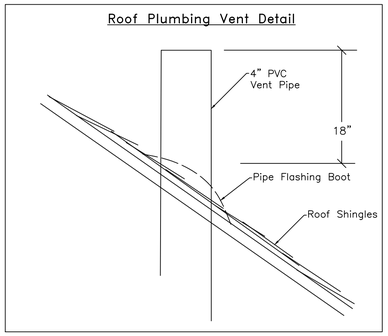
Fire Caulking Plastic Pipes



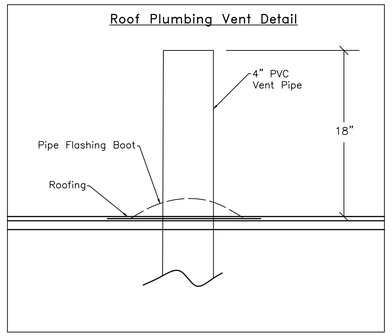
PEX FIXTURE STUB OUTS



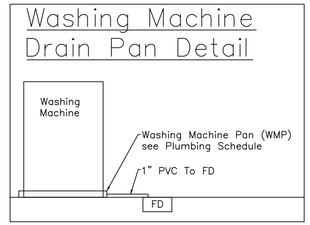
Roof Plumbing Vent Detail



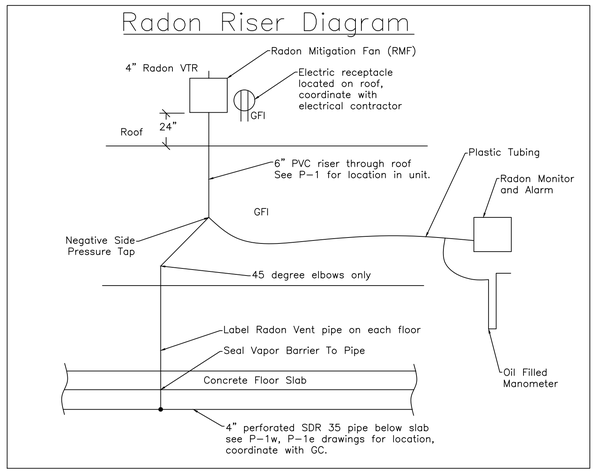
Roof Plumbing Vent Detail



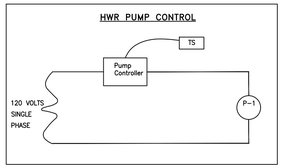
Washing Machine Drain Pan Detail



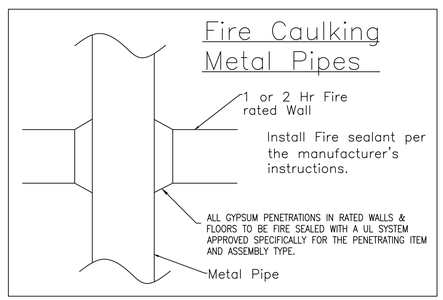
Radon Riser Diagram



HWR PUMP CONTROL



Fire Caulking Metal Pipes



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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

Plumbing Details

REVISIONS
1/26/24
3/11/24

DATE
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P-9

Plumbing Legend

	Valve, ball
	Valve, check
	Valve, balancing
	Union
SAN	Sanitary piping
V	Vent piping
STM	Storm piping
CW	Cold water
HW	Hot water
HWR	Hot water return
HW140	Hot water 140 degrees F.
RPZ	Reduced pressure back flow preventer
PRV	Pressure reducing valve, set at 18 psi
BFP	Back flow preventer
WM	Water meter
S	Strainer, water
GS	Ground Source fluid
IW	Indirectr Waste with funnel
FD	Floor drain, with trap primer connection
RD	Roof drain
SA	Shock absorber
CO	Clean out
FCO	Floor clean out
WCO	Wall clean out
FFHB	Frost free sill cock
UTR	Up Through Roof
VTR	Vent through roof
MV	Mixing valve
PR	Pressure Relief

Plumbing Notes:

1.) a. Supply and install all required rough and finish hardware including fixture shut off valves, tail pieces, traps, drain baskets, wax seals, escutcheons, etc. as required for a complete installation. Make adjustments to any controls, devices and appurtenances for proper operation of equipment and fixtures.

2.) a. Install all equipment per the manufacturer's installation instructions.
All installation and service to be by manufacturer trained personel.
Water closets to have flush handles on open side of fixture.

3.) a. Provide shower, tub and accessories as shown on equipment schedule, no substitutions allowed. Manufacturer's accessories are pre-installed.

4.) a. hot water provided by HVAC contractor.

5.) a. Sanitary and vent piping ran in slab to be a minimum size of 2".

6.) a. Hot, cold and hot water return piping ran above ceiling.

7.) a. See typical unit plan for apartment piping layout and details.

8.) a. See sanitary riser diagram for sanitary and vent pipe sizes and details.

9.) a. See domestic water riser diagram for pipe sizes and details.

10.) a. See fixture schedule for fixture water, drain and vent sizes.

11.) a. Install bellows type pipe expansion devices every 50 feet of straight length of hot water and hot water return piping.

12.) a. Provide access panels for all concealed valves, maintain all required fire ratings.

13.) a. Install sanitary piping with the following slopes:
1-1/4" to 2-1/2" 1/4"/Ft
3" to 6" 1/8"/Ft

14.) a. Install horizontal pipe sway bacing upstream of 90 deg. horizontal elbows

15.) a. Install heat traps in hot water heater hot and cold piping.

16.) a. Install a new water feed, water meter with remote sense readout and back flow preventer per the requirements of the local department of health and water authority.

17.) a. Install a new sanitary sewer per the requirements of the local authority.

18.) a. Label Radon mitigation vent stack on each floor through building.
Seal radon mitigation vent stack to slab vapor barrier and foam insulation.
Install Radon mitigation fan (RMF), coordinate with electrician for power feed.
Install Radon pressure manometer.
Install Radon pressure monitor and alarm.

19.) a. Install Rectorseal model 8276X downspout at emergency drain telltales, size per plan.

20.) a. All plumbing pipe in the mechanical room is to be below the ceiling.

21.) a. All plastic pipe penetrations through sheetrock are to be fire stopped using expanding foam pipe collars attached to the wall.

22.) a. All Gypsum board penatrations in rated walls & floors to be fire sealed with UL system approved specifically for the penatrating item and assembly type.

23.) a. Coordinate fixture installation with architectural bathroom details.

24.) a. Before any excavation, obtain a utility mark out, call 811.

Plumbing Equipment Schedules

Fixtures:

Mark	Description	Manufacturer	Fixture Model	Trim Model	CW Supply Size	HW supply Size	Drain Size	Vent Size	Provide:
LAV-1	Lavatory, counter	Moulded LAV and counter		Delta 520-GPM-DST	1/2	1/2	1-1/2	1-1/2	White, water sense (1.0 gpm)
LAV-2	Lavatory, wall hung	American Standard	0355.027	Delta 520-GPM-DST	1/2	1/2	1-1/2	1-1/2	White, ADA pipe covering, water sense (1.0 gpm)
									Watts WCA-411 floor mounted concealed arm carrier
WC	Water Closet, tank	Penguin	524	-	1/2	-	3	1-1/2	White seat, open for public toilets, water sense (1.28 gpf), non-overflow
									flush handles mounted on open side of fixture
UR	Urinal	American Standard	6590.505		3/4	-	2	1-1/2	(1.0 gpf)
KS-1	Kitchen Sink, single	Elkay, Dayton	DG12522-2	LK1501CR	1/2	1/2	1-1/2	1-1/2	Drain basket, (1.5 gpm), ADA pipe cover as required
TUB	Tub/Shower	Clarion	MP7911(X)X	Delta R10000 UNWS	1/2	1/2	2	1-1/2	Drain, Delta 54471-WH15-BG hand shower, water sense 1.5 GPM
				Delta T13H233					Delta U495S-69-PK hose, U5002-PK swivel mount
									5024 Grab Bar, 5018 Grab bar, 660 soap dish, CR-55 curtain rod
SH	Shower (Mobility Adapted)	Clarion	MP6333(X)BF34	Delta R10000 UNWS	1/2	1/2	2	1-1/2	Brass Drain, Delta 54471-WH15-BG hand shower, water sense 1.5 GPM
				Delta T13H333-25					Delta U495S-69-PK hose, U5002-PK swivel mount
									55030 bar, U4980-PK, 504426TS grab bar, 5018 grab bar, 660 soap dish
									400-26.5"-SDL folding seat, CR-59 1/4 curtain rod, Collapsible treshold kit 2.5A
LS	Laundry Sink	Fiat	Laundry Sink	Chicago #835	1/2	1/2	1-1/2	1-1/2	Vacum breaker
WMB	Washing Machine Box	Oatey	38474	-	1/2	1/2	2	1-1/2	Fire Rated, single lever, stainless steel lint screen
									braided stainless steel hoses
WMP	Washing Machine Pan	Camco	20787	-					With drain fitting, pipe to FD
FD	Floor Drain	J R Smith	2110	-	1/2	-	per plan	2	Strainer, Rectorseal SureSeal floor drain trap seal
HVAC	Condensate Drain	-	-	-	-	-	1-1/2	1-1/2	12" AFF, trap, 1-1/2x3 funnel, Rectorseal SureSeal floor drain trap seal
RD	Roof Drain	JR Smith	1010	-	-	-	per plan	-	strainer
RD	Roof Drain (emergency)	JR Smith	1080	-	-	-	per plan	-	strainer, 2" water dam
WCO	Wall Clean out	-	-	-	-	-	per plan	-	Polished Chrome cover
YCO	Yard Clean out	Zurn	Z1449	-	-	-	per plan	-	Nickel Bronze
FFHB	Frost Free Hose Bib	Woodford	65	-	3/4	-	-	-	Integral vacuum breaker

BFP=Back Flow Preventer
IW= Indirect Waste connection to sanitary

Hot Water Heater:
Hot water feed by HVAC contractor

Pumps:

Mark	Manufacturer	Model	GPM	Head Ft.	HP	Voltage	Provide	Notes
P-1	Enovative	2C99-11	12	16	1/6	120-1 Phz.	1, 2, 3	HWR pump
SP-1	Liberty	283-HV	50	14	1/2	120-1 Phz	5	Sump

Provide:
1.) Enovative AutoHot how weater return controller (HWRC)
2.) Enovative Flow Sensor (FS)
3.) Temperature sensor (TS)
5.) 18"x22" basin with sealed cover, 3" valve & check valve.

Pressure Reducing Valve:

Mark	Manufacturer	Model	Size	Application
PRV	Watts	LF25AUB-Z3	per plan	Main, 75 PSI set point
PRV	Taco	329-T3	1/2	Hydronic

Provide
1.)

Back Flow Preventers:

Mark	Manufacturer	Model	Size	Application	Provide
BFP	Watts	LF709OSY	per plan	Water Main	1, 2
BFP	Watts	LF009M2QT	per plan	Ground Source Feed	3

Provide:
1.) Strainer
2.) OSY valves
3.) Ball valves

Radon Mitigation Fan:

Mark	Manufacturer	Model	CFM	Static	Voltage	Provide
RMF	RadonAway	GX-5A-4	123	2.0	120	1, 2, 3, 4

Provide:
1.) 6x4 rubber inlet coupling.
2.) 4" Weather cap #76002
3.) Manometer RadonAway 50018 and 25067 weatherization kits.
4.) RadonAway fan monitor and alarm Check Point IIA #28001-2

Energy Meter:
HBX Controls model SensorLinx BTU-0130- 1", thermistor, 24 volts, provide transformer.
Provide thermolinx application software.
Provide configuration set up and programming.

Controls:
SA Shock Absorber: Watts model 15-3/4

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19-13

SHEET NUMBER
P-10

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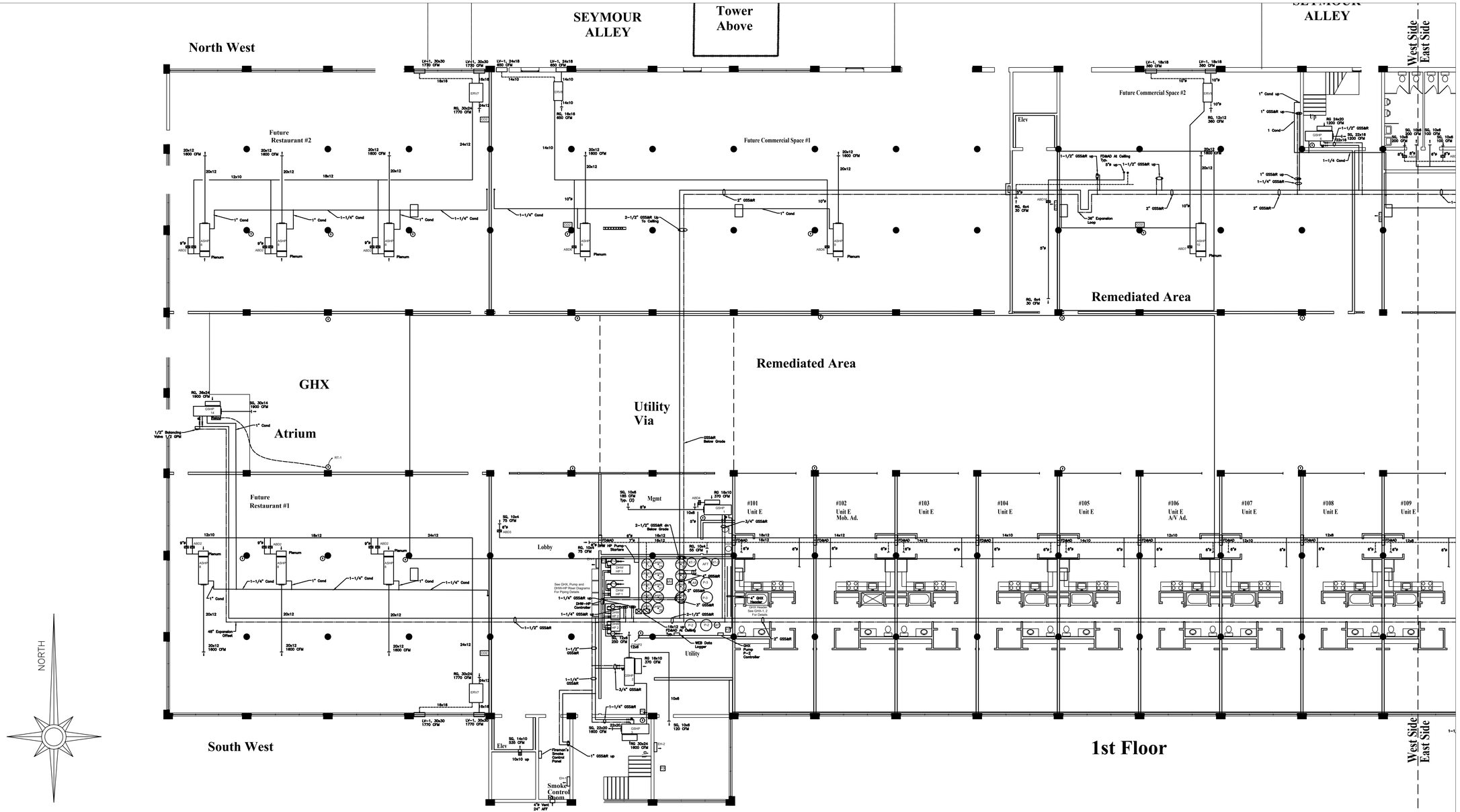
STATE OF NEW YORK JOHN D. GILSON NO. 060816 LICENSED PROFESSIONAL ENGINEER



1 First Floor HVAC Plan

H-1W Scale: 3/32"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

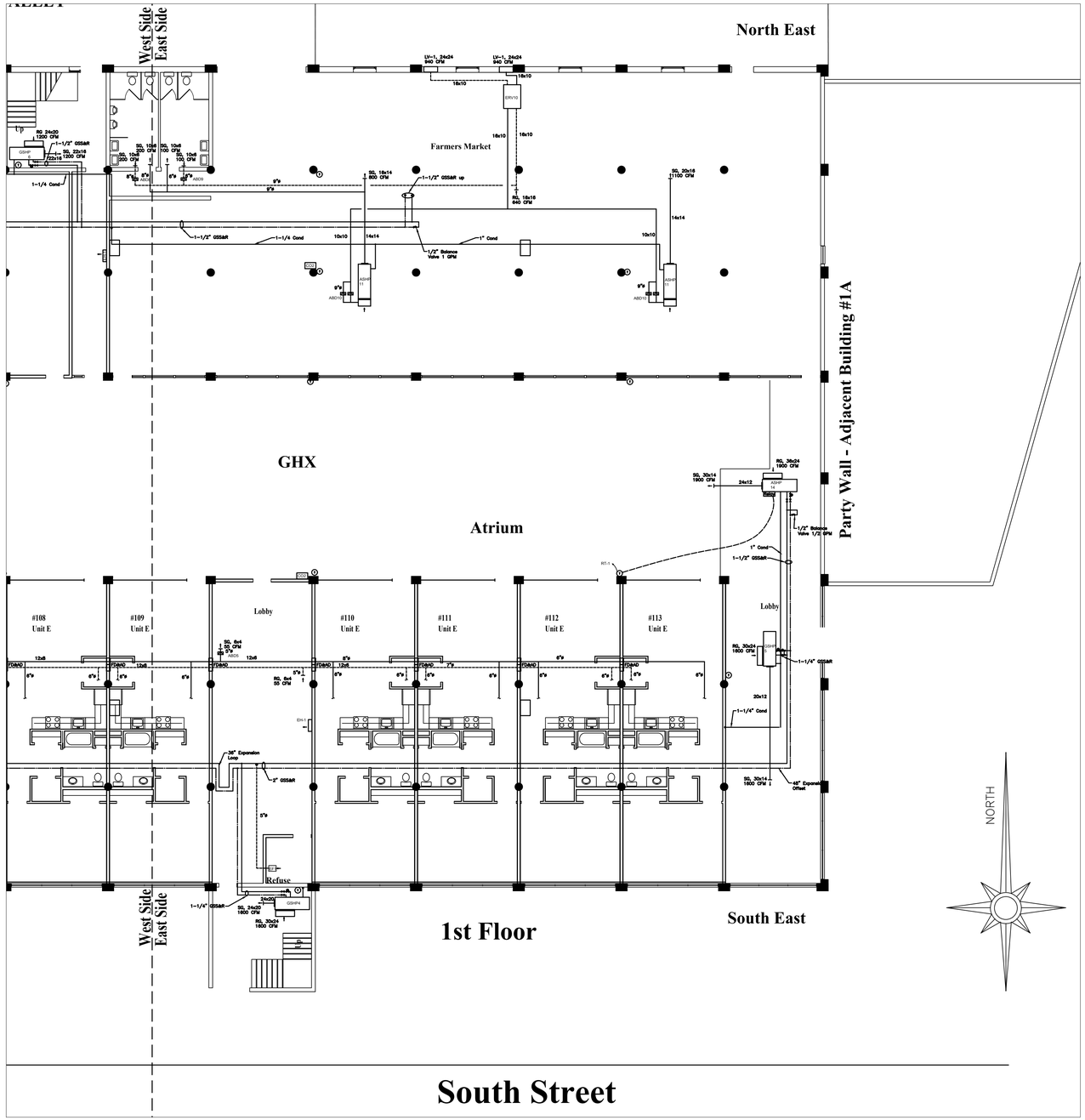
First Floor HVAC West

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
H-1W



1 First Floor HVAC Plan
H-1E Scale: 3/32"=1'-0"

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First Floor HVAC East

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3/11/24

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PROJECT NUMBER
19-13

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H-1E

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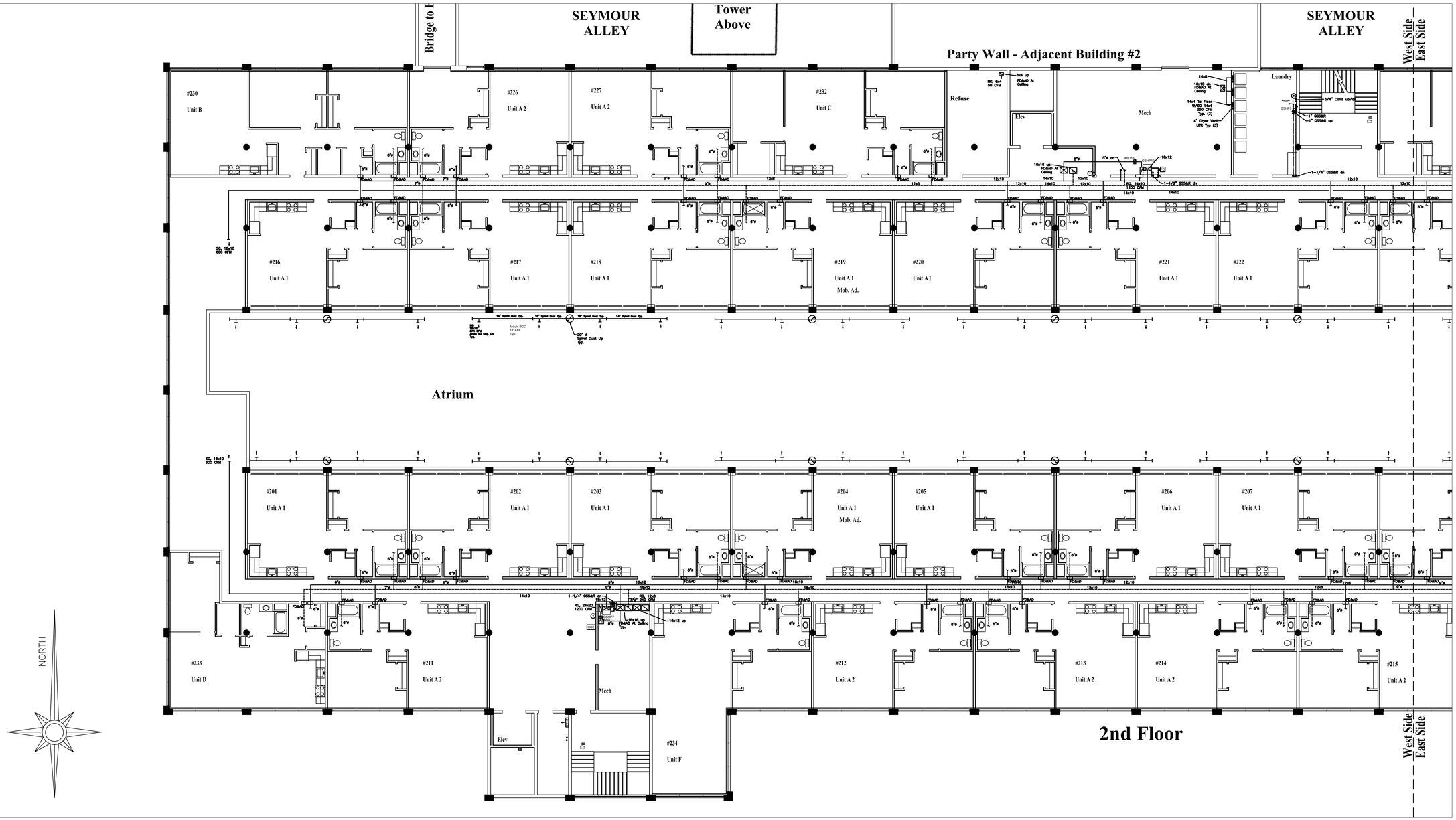

1 2nd Floor HVAC Plan
H-2W Scale: 3/32"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

Second Floor HVAC West

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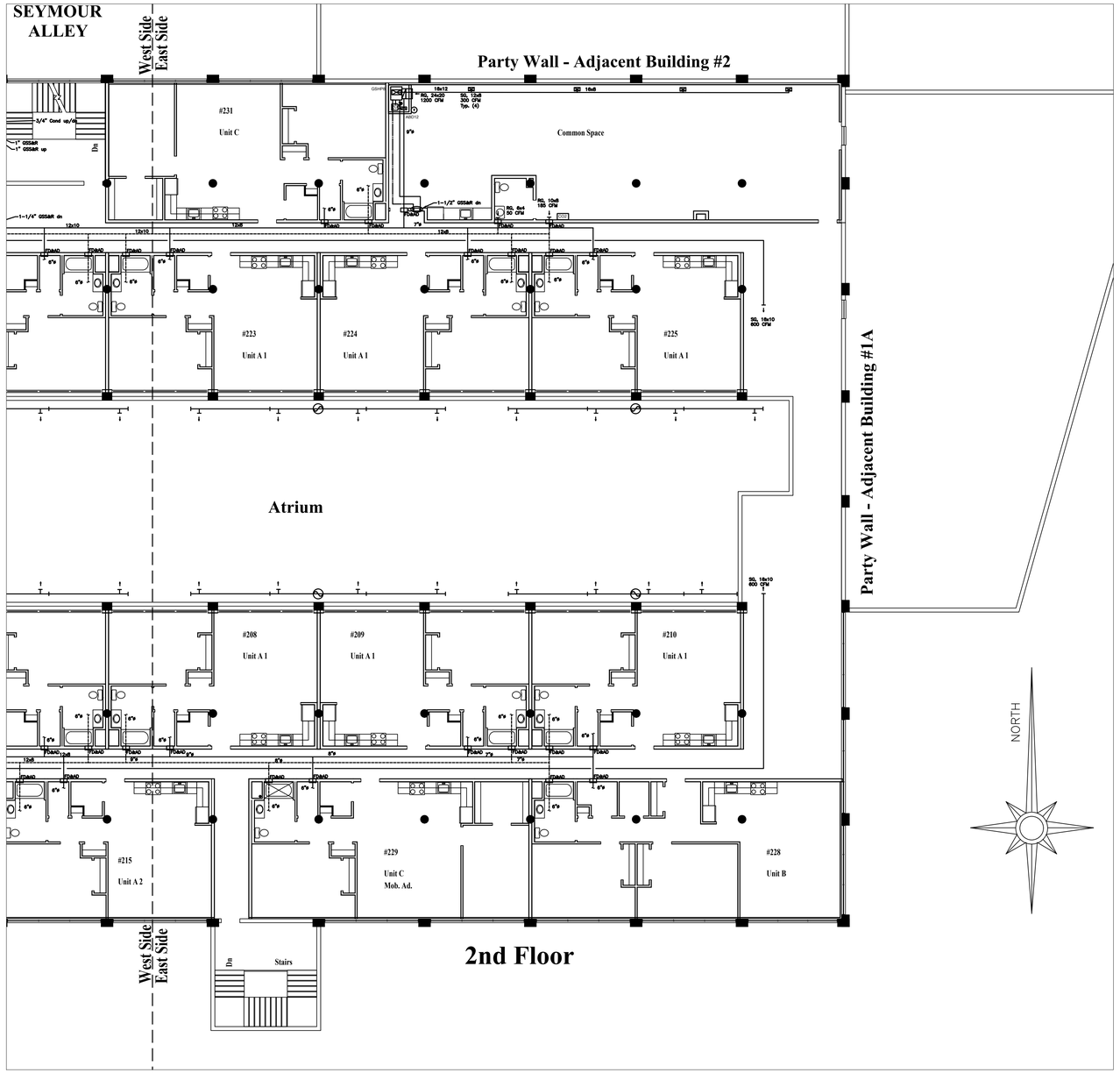
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
20-30

SHEET NUMBER
H-2W



2nd Floor

1 H-2E Second Floor HVAC Plan

Scale: 3/32"=1'-0"

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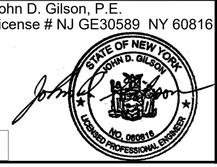

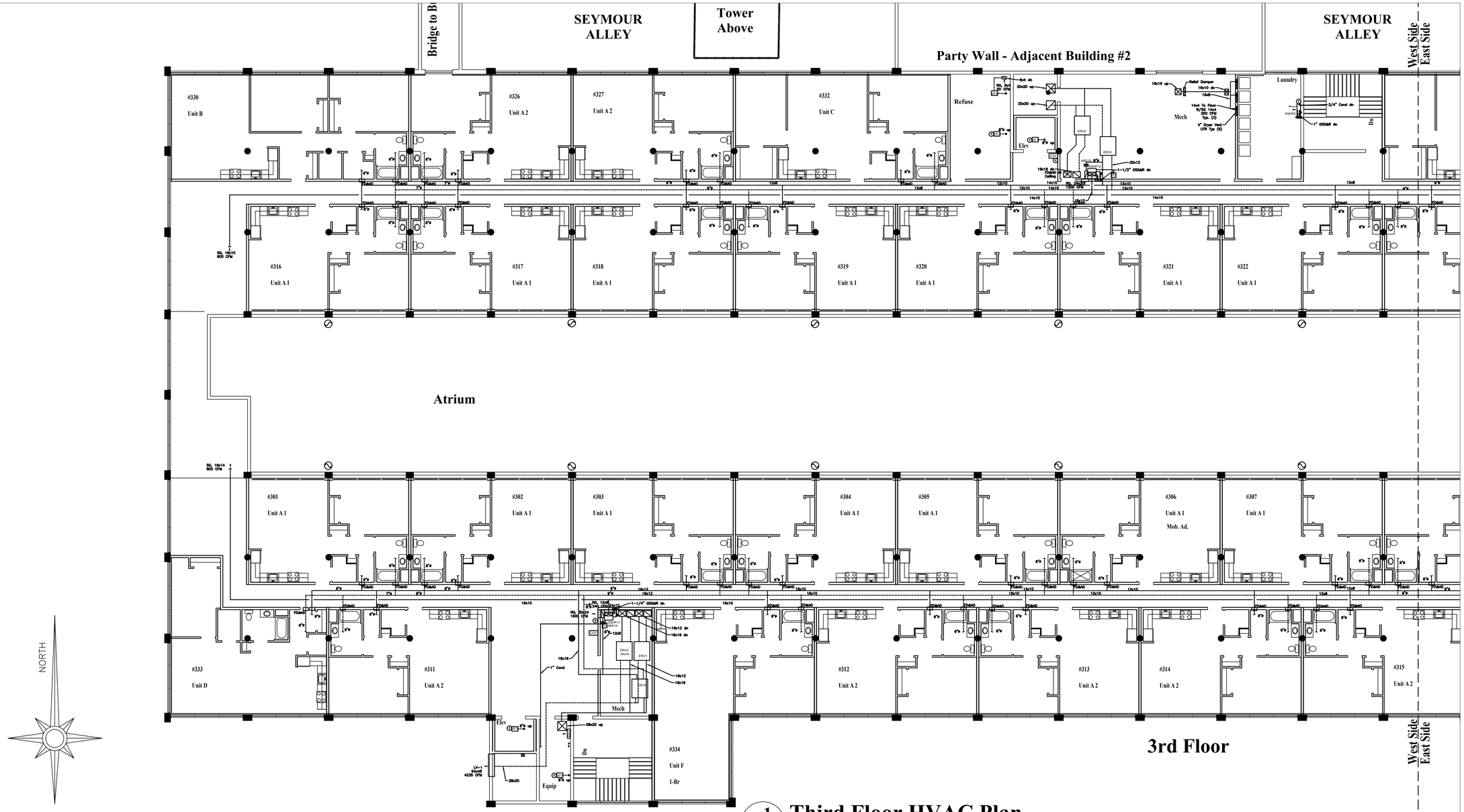

1 Third Floor HVAC Plan

H-3W Scale: 3/32"=1'-0"

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Harrison Place Lofts

210 Walnut Street, Lockport, NY

Third Floor HVAC West

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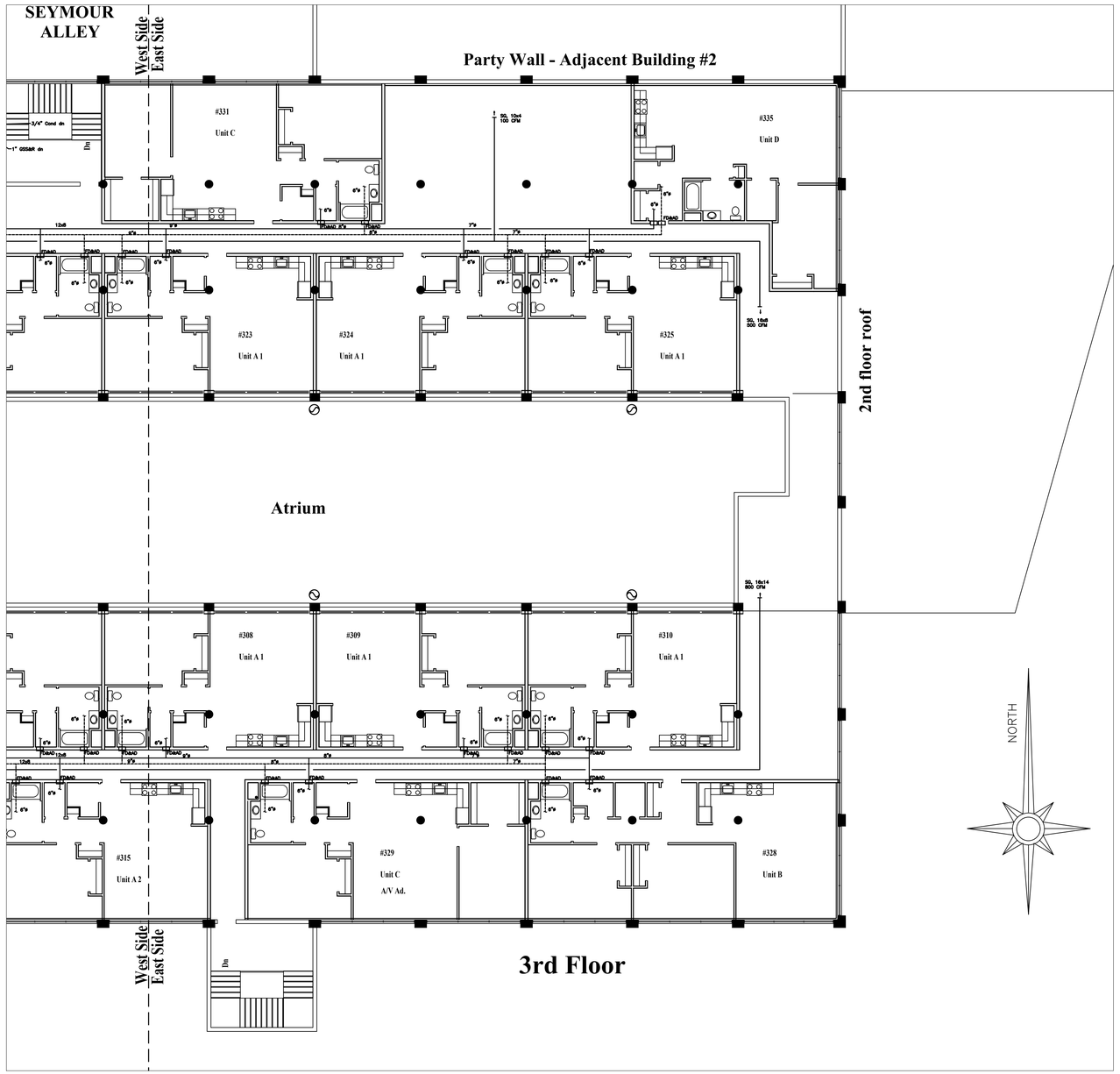

1 H-3E Third Floor HVAC Plan

Scale: 3/32"=1'-0"

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Third Floor HVAC East

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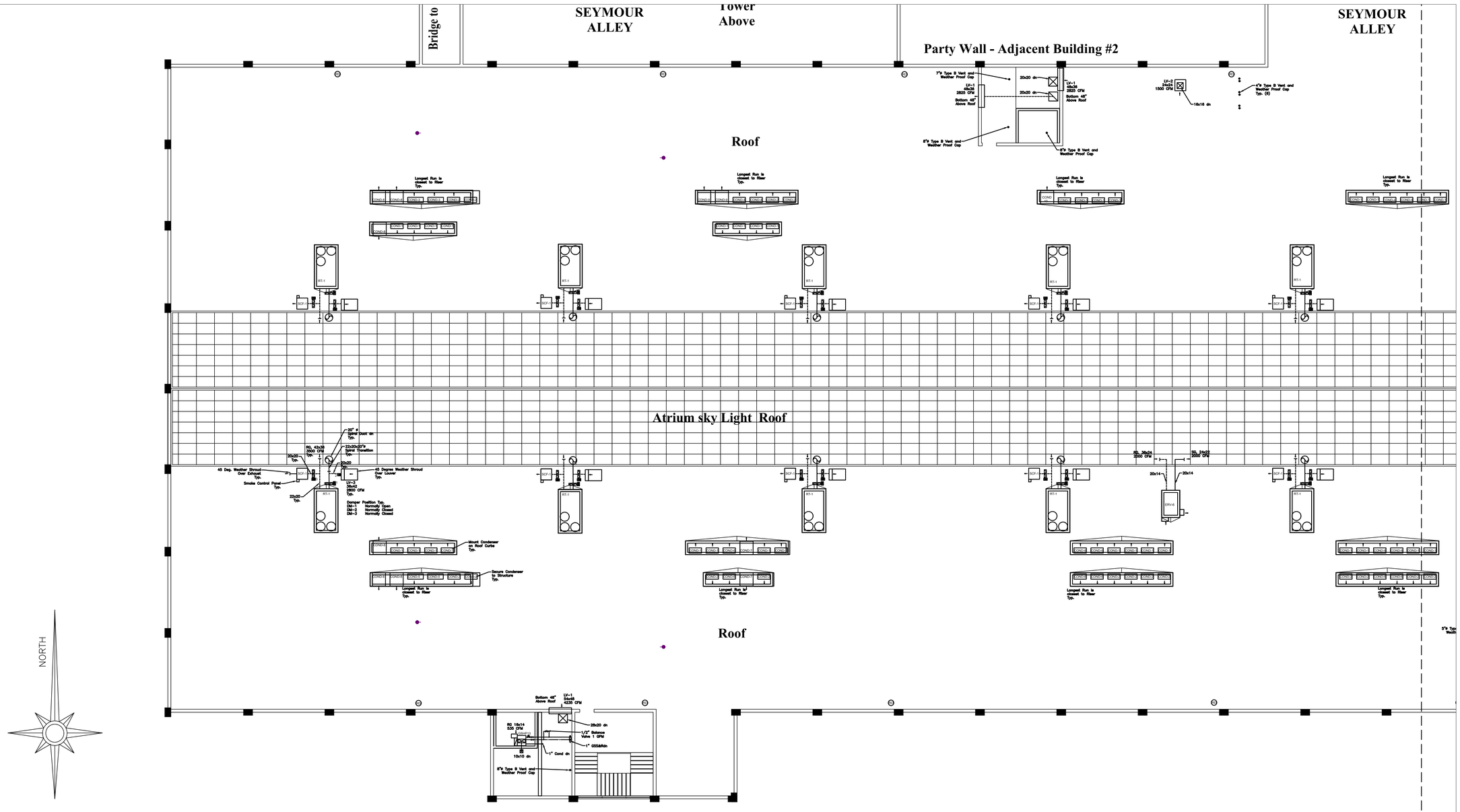

1 Roof HVAC Plan

H-4W Scale: 3/32"=1'-0"

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Roof HVAC West

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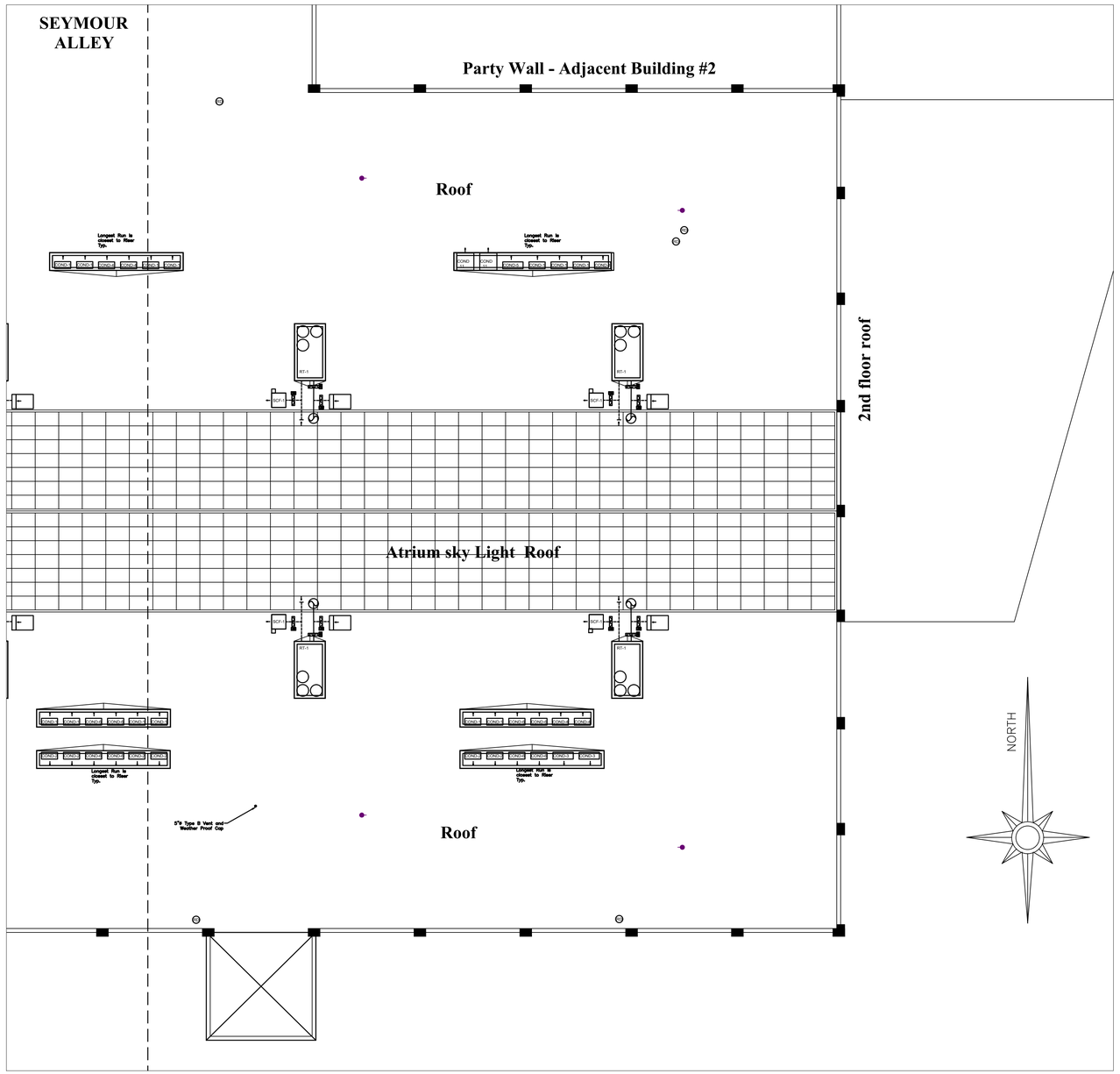

1 **Roof HVAC Plan**
H-4E Scale: 3/32"=1'-0"

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Roof HVAC East

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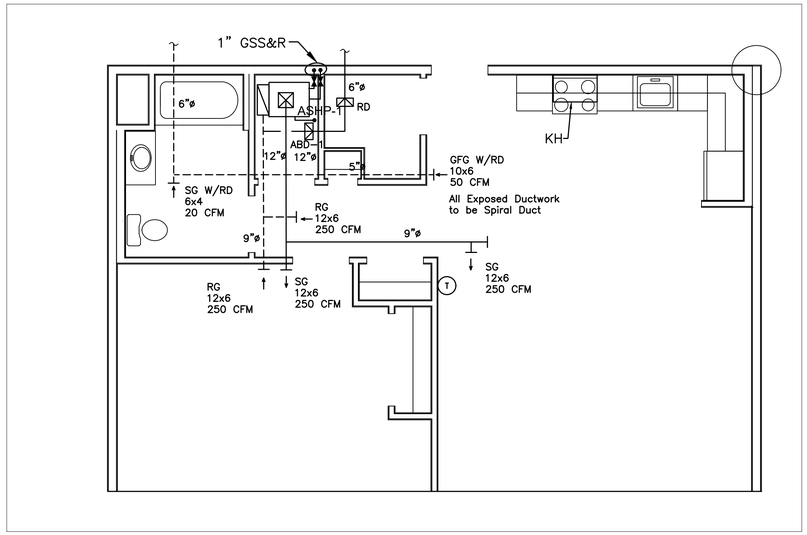
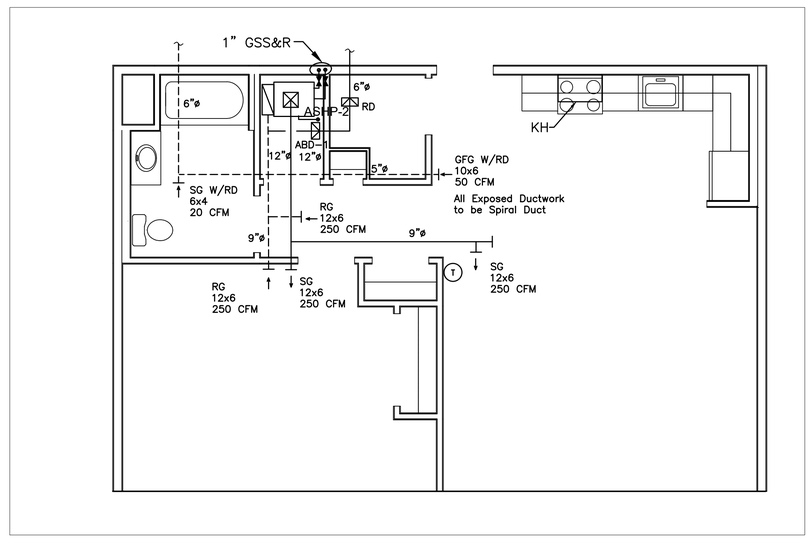


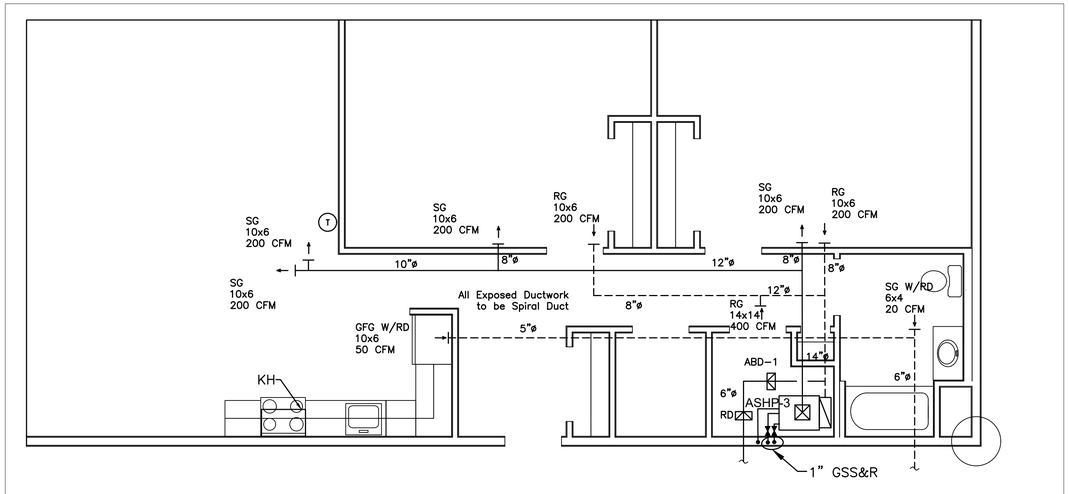
1 H-5 Unit A1 HVAC Plan

Scale: 1/4"=1'-0"



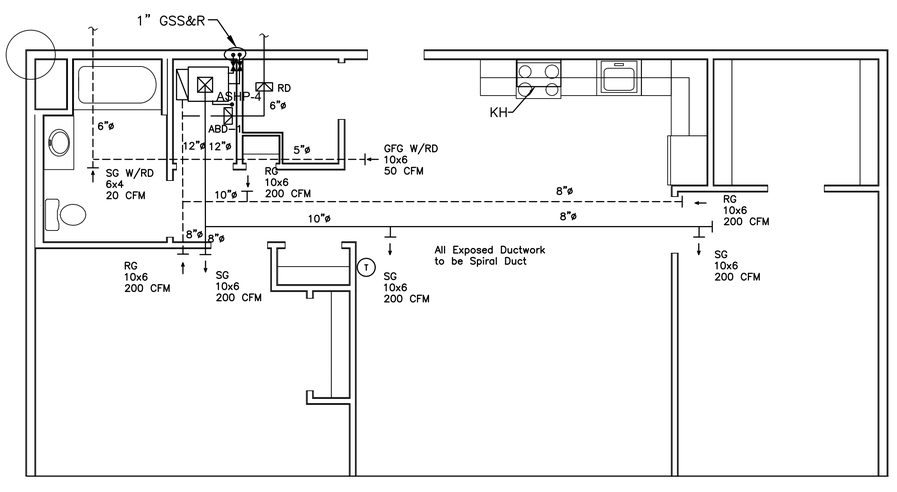
2 H-5 Unit A2 HVAC Plan

Scale: 1/4"=1'-0"



3 H-5 Unit B HVAC Plan

Scale: 1/4"=1'-0"



4 H-5 Unit C HVAC Plan

Scale: 1/4"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
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Typical Unit HVAC Plans

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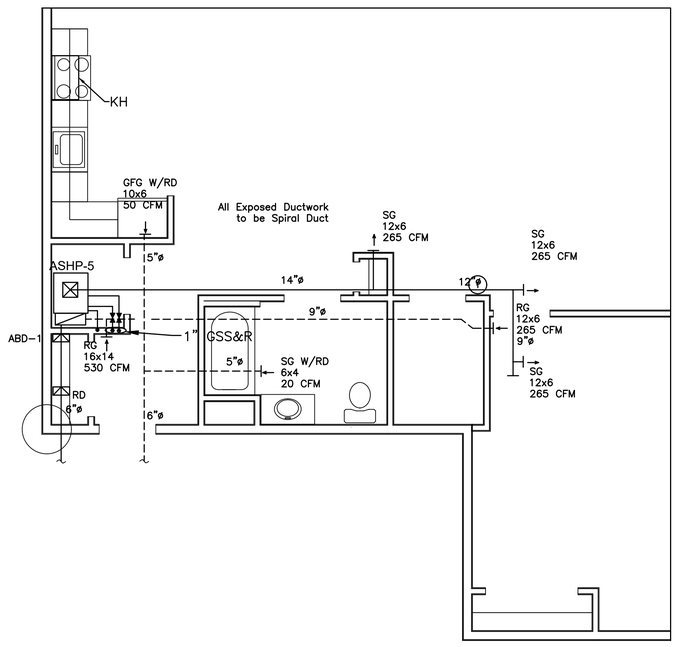
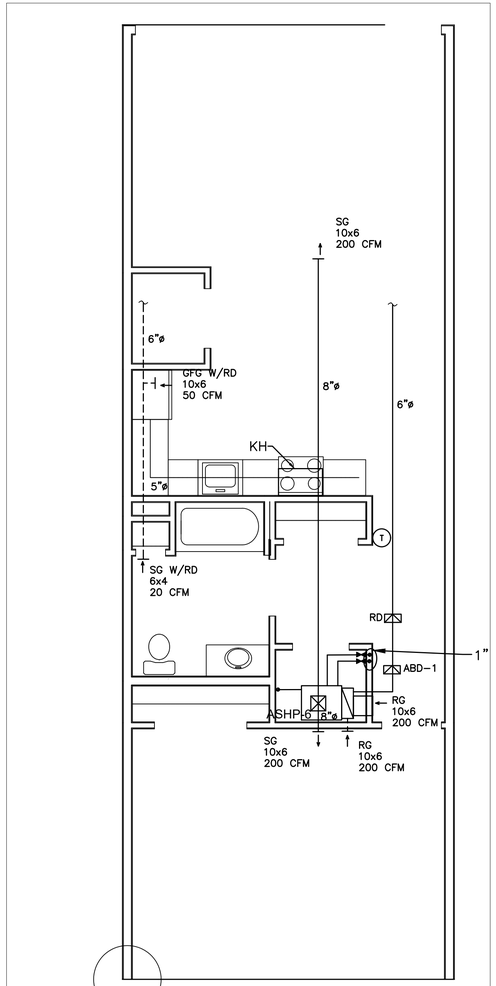


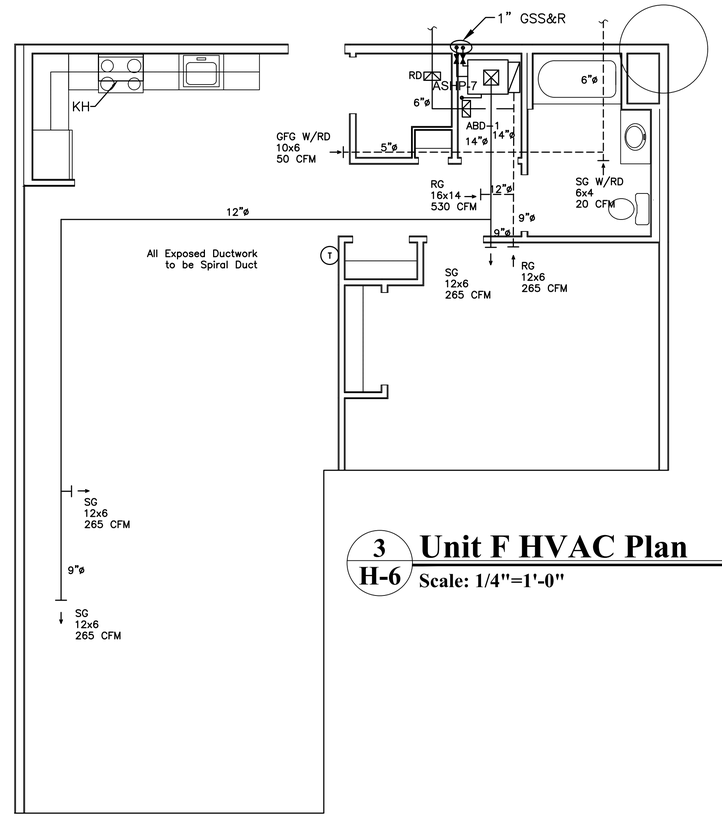
1 H-6 Unit D HVAC Plan

Scale: 1/4"=1'-0"



2 H-6 Unit E HVAC Plan

Scale: 1/4"=1'-0"



3 H-6 Unit F HVAC Plan

Scale: 1/4"=1'-0"

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Harrison Place Lofts

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Typical Unit HVAC Plans

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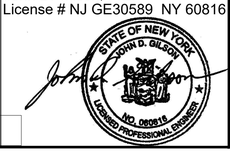
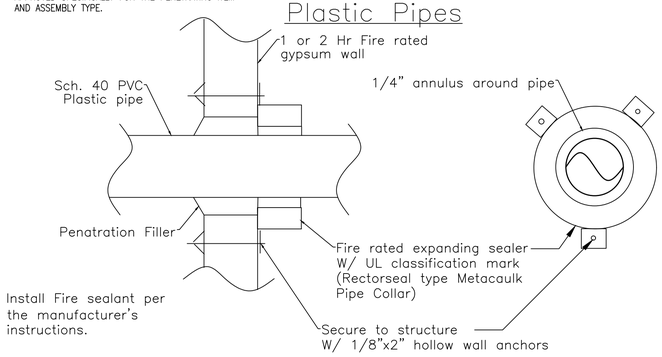
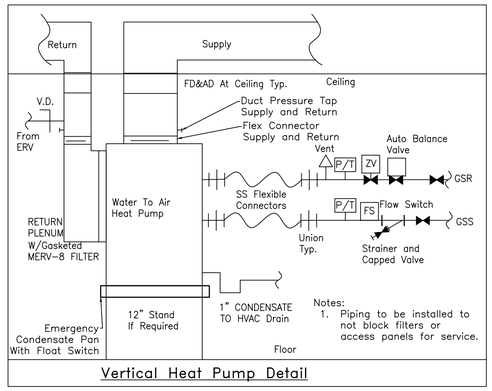


Fire Caulking Plastic Pipes

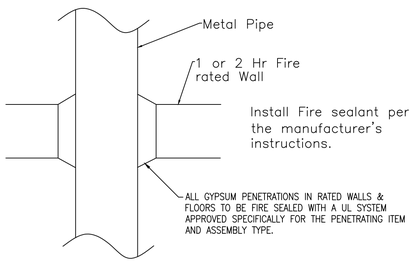
ALL GYPSUM PENETRATIONS IN RATED WALLS & FLOORS TO BE FIRE SEALED WITH A UL SYSTEM APPROVED SPECIFICALLY FOR THE PENETRATING ITEM AND ASSEMBLY TYPE.



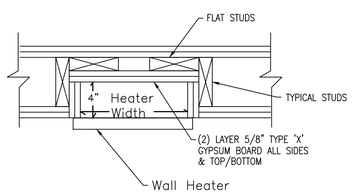


Vertical Heat Pump Detail

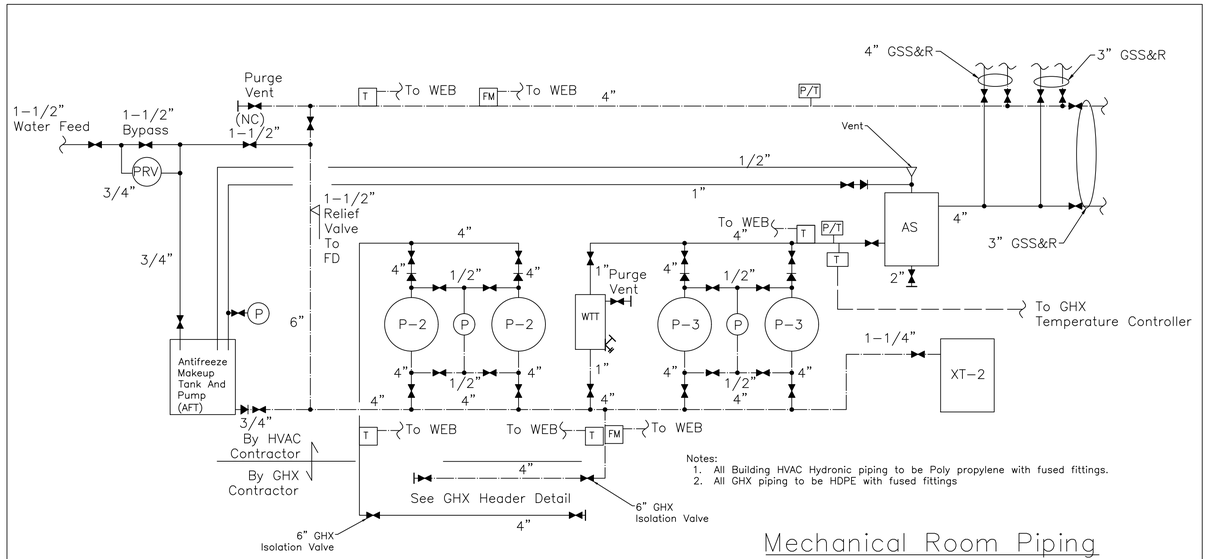
Fire Caulking Metal Pipes And Ducts



Recessed Wall Heater Installation at Rated Wall

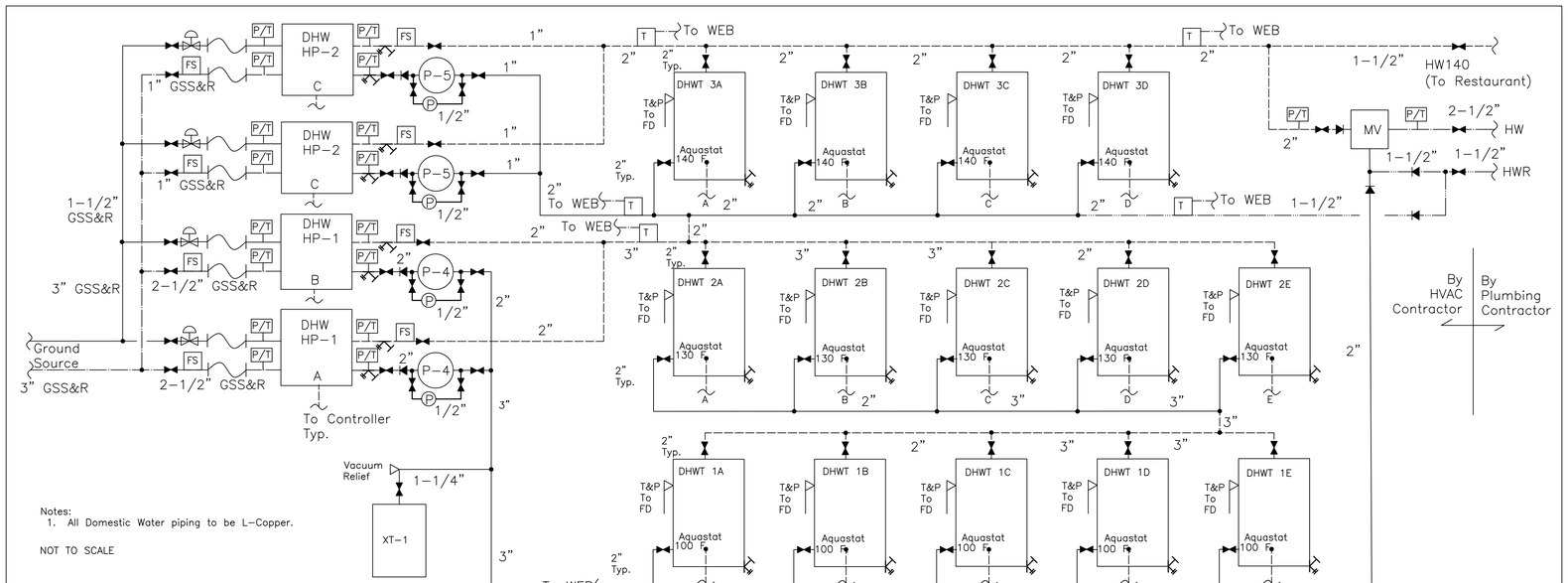


Mechanical Room Piping Schematic



NOT TO SCALE

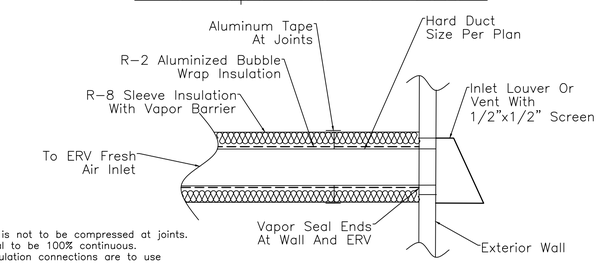
DHW Heat Pump Piping Detail



Notes:
1. All Domestic Water piping to be L-Copper.

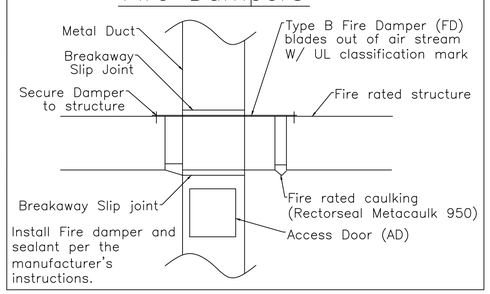
NOT TO SCALE

ERV Inlet Duct Insulation And Vapor Barrier Detail



Notes:
1. Insulation is not to be compressed at joints.
2. Vapor Seal to be 100% continuous.
3. Taped insulation connections are to use aluminum duct tape and are not to be compressed.

Fire Dampers



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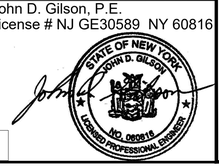

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HVAC Piping Diagrams

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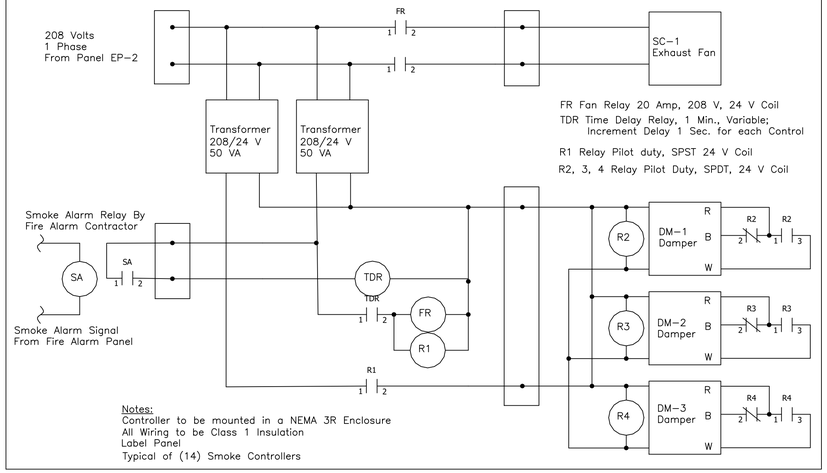
Smoke Control Diagram



Sequence of Operation:

1.) a. Geo-source heat pumps (GSHP-x) operate with associated local thermostat.
b. Heat pump control valve opens with a call for heating or cooling.

2.) a. Air-source heat pumps (ASHP-x) operate with associated thermostat.

3.) a. Rooftop units operate with associated thermostat.
b. Rooftop unit associated with GSHP-14:
GSHP-14 is stage 1 cooling only, thermostat set 1 degree below nominal Atrium temperature.
RT-1 is stage 2 cooling and stage 3 cooling after 15 minute delay.

4.) a. Apartment ERV operates continuously at set point ventilation rate.
b. Bathroom timer switch forces ERV into full flow mode.
c. Common area ERVs operate with wall or duct mounted CO2 sensor at set point ventilation rate.

5.) a. All air circulating equipment shuts down upon a fire alarm signal, provide relays as required.

6.) a. One Building loop circulator pump P-3 operates at a time.
b. Building loop circulator pump P-3 operates on preprogrammed pump quadratic system curve.
c. Set control in quadratic curve mode and minimum set point to 20 Hz.

7.) a. One GHX circulator pump P-2 operates at a time:
b. GHX circulator pump P-2 operates on building loop fluid temperature (T deg. F.) as follows:
1.) T<35: Full specified flow.
2.) T>35, T<45: Linear ramp from full specified flow to 20 Hz.
3.) T>45, T<75: Pump off.
4.) T>75, T<85: Linear ramp from 20 Hz to full specified flow.
5.) T>85: Full specified flow.
See GHX pump controller detail.

8.) a. Domestic hot water heat pump DHW-HP-1 operates with Tank #1 and #2 aquastat, set point 100 and 130 deg. F respectively.
b. Domestic hot water pump P-4 operates with DHW-HP-1.
c. Systems alternatre upon a call for heat.
d. Both systems operate upon a call for heat from both tanks simultaneously.

9.) a. Domestic hot water heat pump DHW-HP-2 operates with Tank #3 aquastat, set point 140 deg. F.
b. Domestic hot water pump P-5 operates with DHW-HP-2.

10.) a. Domestic hot water mixing valve MV controls the mixed water temperature, set point 110 deg. F.

11.) a. Smoke Control: Upon the beam smoke detector (BSD) sensing smoke in the Atrium, time delay relays start each SC-1 sequentially with a 1 second delay between each exaust fan.
b. All RT-1 units stop.
c. Damper DM-1 closes and damper DM-2, DM-3 open.
d. Upon the smoke alarm being cleared, the sequence is reversed for all units simultaneously.

NYS Clean Heat Commissioning Procedure

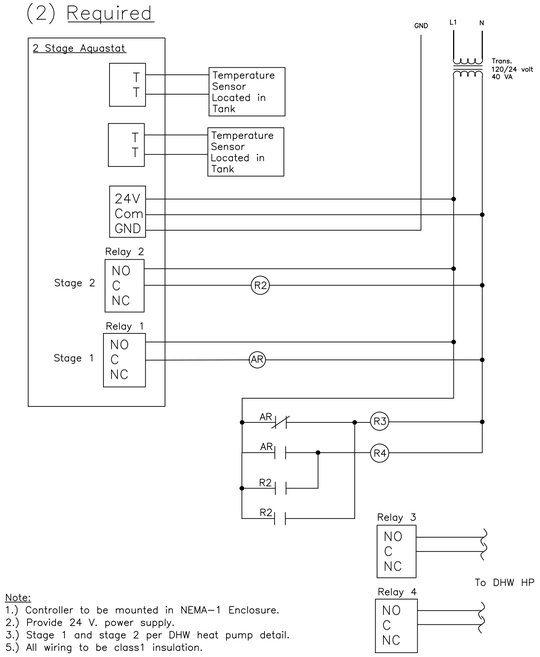
GHX

1. GHX Leak Test, see 15710 Ground Heat Exchanger specification.
2. Water quality sample and test, see 15550 Water Quality specification.
3. Flushing and Purging, see 15710- Ground Heat Exchanger specification.
4. Antifreeze type and concentration, see GS-2 drawing for antifreeze specification.
5. GHX Flow & Pressure Test, see 15710 Ground Heat Exchanger specification.
   a. Measure pressures at P&T ports for each loop at GHX header, compare measurements to the requirements on GS-2.

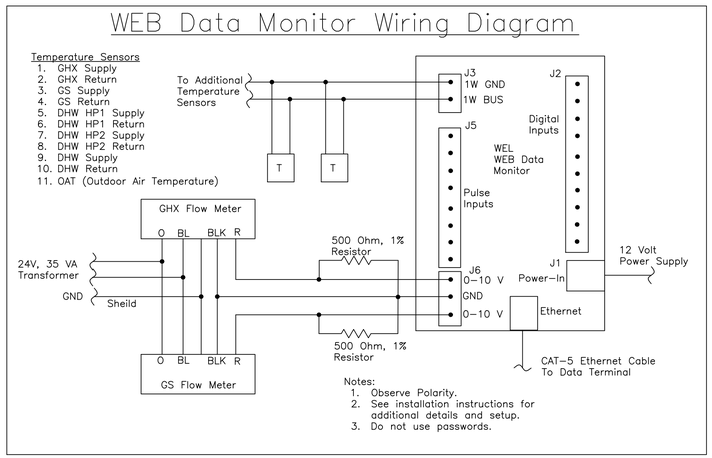
GS HPs

6. Air balance all ERV's per HVAC plans and equipment schedule
7. Air balance all water to air heat pumps per HVAC plans and equipment schedule.
8. Operate GHX pump (P-2) at design flow and confirm design pressure differential.
9. Operate GS building loop pump (P-3) at design flow and confirm design pressure differential.
10. Water dT, Flow and Pressure measurements:
    a. Measure fluid side pressure and temperatures at the P&T test ports.
    b. Confirm differential pressures match equipment requirements.
11. Condensate drain function test:
    a. Confirm piping and fittings are connected and free of leaks.
    b. Pour 1 gallon of water in condensate pan or condensate plug tap.
12. Equipment function test (heating and cooling mode):
    a. Operate thermostat in both heating and cooling modes for 5 minutes each.
    b. Measure and confirm temperature change at diffuser cooling 60 degrees F. maximum, heating 90 degrees F minimum.
    c. Notify engineer of deviations.
13. Air filter verification:
    a. Confirm specified filter type and installation with air seals around filter.

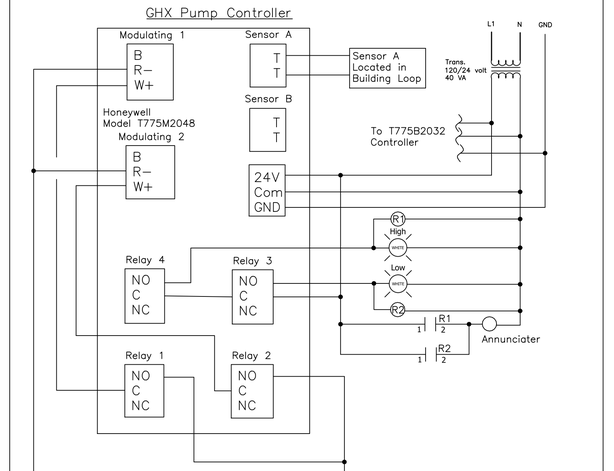
DHW HP Alternating Relay and Sequencer (2) Required



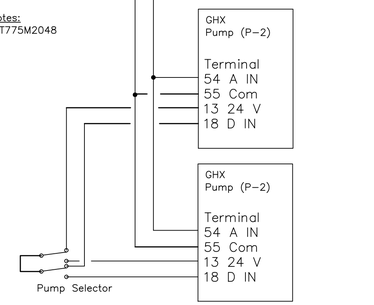
WEB Data Monitor Wiring Diagram



GHX Pump Controller Wiring Diagram



GHX Pump (P-2) Controller Notes:
1.) Controller Honeywell Model T775M2048 Programing:
2.) Modulating Output 1:
a. Heat Mode
b. Set point=50 F
c. Throttle Range=10 F
d. Integral=0
3.) Relay 1:
a. Heat mode
b. Set Point=56 F
c. Differential=10
4.) Modulating Output 2:
a. Cool mode
b. Set point=80 F
c. Throttle Range=10 F
d. Integral=0
5.) Relay 2:
a. Cool mode
b. Set Point=76 F
c. Differential=10
6.) Relay 3:
a. Heat mode
b. Set Point=25 F
c. Differential=1
7.) Relay 4:
a. Cool mode
b. Set Point=90 F
c. Differential=1



GHX P-2 Programing:
Analog Signal 0-10 Volts
1.) 0 V = Pump off
2.) 2 V = Pump 20 Hz.
3.) 10 V = Pump 56 Hz. full Flow

Note:
1.) Controller to be mounted in NEMA-1 Enclosure.
2.) Provide 24 V. power supply.
3.) Alarm lights to be mounted on panel cover.
4.) Label Panel and Lights.
5.) All wiring to be class1 insulation.

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

HVAC Schematics And Sequence of Operation

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
H-8

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Equipment Schedules

Exhaust Fan:

Mark	Manufacturer	Model	CFM	Ext. Static in. H2O	Watts/HP	RPM	Voltage	Provide	Application
EF-1	Broan	AE50110DC	50	0.25	23	900	120-1 Phz	1, 2, 5	Refuse
EF-2	Greenheck	CSP-A125	124	0.25	55	1100	120-1 Phz	4, 5	Refuse
EF-3	Greenheck	SP-A200	196	0.25	135	1350	120-1 Phz	4, 5	Elevator, Controller
SC-1	Greenheck	CUBE-180	2800	0.55	3/4	950	208-1 Phz	7, 8	Smoke Control

Provide:

1.) Energy Star labeled
2.) Operates with occupancy sensor
3.) Operates continuously
4.) Operates with line voltage thermostat
5.) Provide ceiling radiation damper (RD) at face.
6.) Speed Control
7.) Smoke Control UL 705 supplement SD
8.) Transformer 208/24 volts, 75 VA; (3) 24 V, SPST relays and time delay relay 1 min, variable.

Kitchen Exhaust:

Mark	Manufacturer	Model	CFM	Ext. Static in. H2O	Watts / HP	Voltage	Provide
KH	Broan	BCSEK130SS	150/150	0.15	70	120	1

Provide:

1.) Light and fan wall mounted switches in mobility adapted units.

Registers and Grills:

Mark	Manufacturer	Model	Provide	Size	Notes
RG	Tuttle & Bailey	T-70-D		per plan	
GFG	LifeBreath	10-002		per plan	Grease Filter
SG	Tuttle & Bailey	A-64	1, 2	per plan	
LV-1	Greenheck	ESK-402	2, 3	per plan	
LV-2	Greenheck	WIH Penthouse	2, 3	per plan	
LV-2	Greenheck	EAC-401	2, 3	per plan	Louver/Damper

Sizes as shown on plan, color by architect

Provide:

1.) Damper
2.) Aluminum
3.) Bird Screen

Geo-Source Heat Pumps:

Mark	Manufacturer	Model	Supply CFM	Fresh Air CFM	Ext. Static in. H2O	Flow Rate GPM	Cooling Sensible MBTU/Hr.	Cooling Latent MBTU/Hr.	Cooling Pressre Diff. Ft H2O	Heat MBTU/Hr.	Heating Pressre Diff. Ft H2O	EER	COP	Voltage	Hose Kit Size (in.)	Provide	Application
GSHP-1	Water Furnace	NBH009ER006DBNAD2B30SSJ	370	55	0.4	2.0	6.5	2.33	8.9	7.03	10.5	17.1	3.6	208-1 phz	3/4	1, 2, 3, 4, 5, 6, 7, 8	Management
GSHP-2	Water Furnace	NBV012TR006DBNAN2B30SSJ	370	0	0.4	2.5	7.57	4.91	2.8	8.45	3.0	17.1	3.6	208-1 phz	1	1, 2, 3, 4, 5, 6, 7, 8	Utility
GSHP-3	Water Furnace	NBH049ER004DBNAD2B30SSJ	1603	0	0.5	9.0	31.48	14.94	5.6	34.73	7.1	19.3	4.0	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Stairs SW
GSHP-4	Water Furnace	NBH049ER004DBNAD2B30SSJ	1603	0	0.5	9.0	31.48	14.94	5.6	34.73	7.1	19.3	4.0	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Stairs SE
GSHP-5	Water Furnace	NBH049ER004DBNAD2B30SSJ	1603	0	0.5	9.0	31.48	14.94	5.6	34.73	7.1	19.3	4.0	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Lobby E
GSHP-6	Water Furnace	NBV038TR004DBNAD2B30SSJ	1212	0	0.5	7.0	26.47	9.09	5.2	25.85	6.6	19.7	4.2	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Stairs N
GSHP-7	Water Furnace	NBV038TR004CANAN0A30SSJ	1212	240	0.5	7.0	26.47	9.09	5.2	25.85	6.6	19.7	4.2	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Corridor 2nd S
GSHP-8	Water Furnace	NBV038TR004CANAN0A30SSJ	1212	240	0.5	7.0	26.47	9.09	5.2	25.85	6.6	19.7	4.2	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Community Rm
GSHP-9	Water Furnace	NCW12L011CNNB7SSH	400	0	0.5	2.3	7.7	2.11	3.6	9.53	5.0	14.2	3.5	208-1 phz	3/4	1, 2, 3, 4, 5, 6, 7, 8	Laundry
GSHP-10	Water Furnace	NBV038TR004CANAN0A30SSJ	1212	240	0.5	7.0	26.47	9.09	5.2	25.85	6.6	19.7	4.2	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Corridor 2nd N
GSHP-11	Water Furnace	NBH049ER004DBNAD2B30SSJ	1603	100	0.5	9.0	31.48	14.94	5.6	34.73	7.1	19.3	4.0	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Corridor 3rd S
GSHP-12	Water Furnace	NBV038TR004CANAN0A30SSJ	1212	240	0.5	7.0	26.47	9.09	5.2	25.85	6.6	19.7	4.2	208-1 phz	1-1/4	1, 2, 3, 4, 5, 6, 7, 8	Corridor 3rd N
GSHP-13	Water Furnace	NBV018TR004DBNAD2B30SSJ	536	0	0.5	4.0	9.86	5.4	7.7	13.42	9.0	18.3	3.8	208-1 phz	1	1, 2, 3, 4, 5, 6, 7, 8	Elevator S
GSHP-14	Water Furnace	NBV060TR004DBNAD2B30SSJ	1900	0	0.5	12.0	47	17.5	7.6	83.0	9	17.4	3.7	208-1 phz	1-1/2	1, 2, 3, 4, 5, 6, 7, 8	Atrium End

GS temperatures: Heating 35 F., Cooling 85 F.

Provide:

1.) Energy Star Labeled
2.) 7 day electronic programmable thermostat
3.) Emergency condensate pan and overflow switch
4.) MERV 8 filter (<300 ft/min vel.)
5.) Arora aid and diagnostics tool.
6.) Hose Connector kits with Strainer, flow control valve, automatic balance valve, P/T ports and air vent.
7.) Insulated water coil, compressor sound package, 4-sided filter rack
8.) Flow switch

DHW Heat Pumps:

Mark	Manufacturer	Model	GS Flow Rate GPM	GS Pressre Diff. Ft H2O	DHW Flow Rate GPM	DHW Pressre Diff. Ft H2O	Capacity MBTU/Hr.	Voltage	Hose Kit Size (in.)	Provide
DHW-HP-1	Water Furnace	NXW180D	45.0	1.2	34.0	1.4	171.7	208-3 phz	2-1/2	1, 2
DHW-HP-2	Water Furnace	NSW025H00ACSSG	4.0	3.7	4.0	2.8	21.7	208-1 phz	1	1, 2

GS temperatures: Heating 35 F., Cooling 85 F.

Provide:

1.) Alternator and Sequencer Control relays
2.) (2) Flow Switches
3.) Hose Connector kits with Strainer, flow control valve, automatic balance valve, P/T ports and air vent.

Air-Source Heat Pumps Air Handlers:

Mark	Manufacturer	Model	Supply CFM	Fresh Air CFM	Ext. Static in. H2O	Cooling Sensible MBTU/Hr.	Cooling Latent MBTU/Hr.	Heat MBTU/Hr.	Voltage	Provide	Application
ASHP-1	Mitsubishi	SVZ-KP12NA	448	70	0.5	11.0	1.0	15	208-1 phz	1, 2, 3, 4	Apt A1
ASHP-2	Mitsubishi	SVZ-KP12NA	448	70	0.5	11.0	1.0	15	208-1 phz	1, 2, 3, 4	Apt A2
ASHP-3	Mitsubishi	SVZ-KP30NA	875	70	0.5	22.4	4.6	32	208-1 phz	1, 2, 3, 4	Apt B
ASHP-4	Mitsubishi	SVZ-KP12NA	448	70	0.5	11.0	1.0	15	208-1 phz	1, 2, 3, 4	Apt C
ASHP-5	Mitsubishi	SVZ-KP30NA	875	70	0.5	22.4	4.6	32	208-1 phz	1, 2, 3, 4	Apt D
ASHP-6	Mitsubishi	SVZ-KP12NA	448	70	0.5	11.0	1.0	15	208-1 phz	1, 2, 3, 4	Apt E
ASHP-7	Carrier	FE4ANF002L	650	70	0.5	13.2	1.0	13.7	208-1 phz	1, 2, 3, 4	Apt F
ASHP-8	Carrier	FE4ANF006L	1,600	590	0.5	31.6	13.4	28.5	208-1 phz	1, 2, 3, 5, 6, 7	Restaurants
ASHP-9	Carrier	FE4ANF006L	1,600	325	0.5	31.6	13.4	28.5	208-1 phz	1, 2, 3, 5, 6, 7	Commercial 1
ASHP-10	Carrier	FE4ANF006L	1,600	360	0.5	31.6	13.4	28.5	208-1 phz	1, 2, 3, 5, 6, 7	Commercial 2
ASHP-11	Carrier	FE4ANF005L	1,100	470	0.5	22	10.5	24	208-1 phz	1, 2, 3, 5, 6, 7	Farmer's Market

Provide:

1.) Energy Star Labeled
2.) Emergency condensate pan and overflow switch
3.) MERV 8 filter (<300 ft/min vel.)
4.) Mitsubishi Wired Controller
5.) Carrier User Interface
6.) TXV kit
7.) 7 day programable thermostat

Air-Source Heat PumpsConders:

Mark	Manufacturer	Model	Tons Nominal	Voltage	Refrigerant Pipe	SEER	COP	Provide	AHRI #	Application
Cond-1	Mitsubishi	SUZ-KA12NAHZ	1.0	208 V-1 Phz	1/2" S, 1/4" L	19	3.8	1	211289250	Apt A1
Cond-2	Mitsubishi	SUZ-KA12NAHZ	1.0	208 V-1 Phz	1/2" S, 1/4" L	19	3.8	1	211289250	Apt A2
Cond-3	Mitsubishi	SUZ-KA30NAHZ	2.5	208 V-1 Phz	5/8" S, 3/8" L	15	3.9	1	213617714	Apt B
Cond-4	Mitsubishi	SUZ-KA12NAHZ	1.0	208 V-1 Phz	1/2" S, 1/4" L	19	3.8	1	211289250	Apt C
Cond-5	Mitsubishi	SUZ-KA30NAHZ	2.5	208 V-1 Phz	5/8" S, 3/8" L	15	3.9	1	213617714	Apt D
Cond-6	Mitsubishi	SUZ-KA12NAHZ	1.0	208 V-1 Phz	1/2" S, 1/4" L	19	3.8	1	211289250	Apt E
Cond-7	Carrier	25VN424A	2.0	208 V-1 Phz	5/8" S, 3/8" L	22	3.78	1, 2	206788329	Apt F
Cond-8	Carrier	25VN448A	4.0	208 V-1 Phz	7/8" S, 3/8" L	22	3.9	1, 2	205272761	Restaurants
Cond-9	Carrier	25VN448A	4.0	208 V-1 Phz	7/8" S, 3/8" L	22	3.9	1, 2	205272761	Commercial 1
Cond-10	Carrier	25VN448A	4.0	208 V-1 Phz	7/8" S, 3/8" L	22	3.9	1, 2	205272761	Commercial 2
Cond-11	Carrier	25VN436A	3.0	208 V-1 Phz	5/8" S, 3/8" L	22.5	3.8	1, 2	205272505	Farmer's Market

Note: Condenser is matched to air handlers for performance specification.

Refrigerant pipe is type ACR copper tubing, insulate with 1" Armaflex foam rubber insulation.

Provide:

1.) Energy Star Labeled
2.) Low ambient kit

Roof Tops:

Mark	Manufacturer	Model	Supply CFM	Outdoor CFM	Ext. Static in. H2O	Cooling Sensible MBTU/Hr.	Cooling Latent MBTU/Hr.	Heating Capacity MBTU/Hr.	Efficiency EER	Efficiency COP	Voltage	Provide	Provide	Application
RT-1	Carrier	50HCQD12J2A36W3K	3500	0	1.0	88.0	27.0	52.0	12.30	3.50	208 V, 3 Phz	1, 2, 3, 4, 5, 6, 7, 8, 9		Atrium

Note: Equipment design based on summer: 95 db/72 wb outdoor conditions, 75 db/63 wb indoor conditions,
and winter: 0 db outdoor conditions, 70 db indoor conditions.

Provide:

1.) Roof curb
2.) Digital 7 day programmable thermostat
3.) Economizer with enthalpy control
4.) Low ambient kit
5.) MERV 8 filter (<300 ft/min vel.)
6.) Premium efficiency motor
7.) Condensate overflow switch
8.) 2 speed indoor blower VFD
9.) Low leak enthalpy controlled fault detecting economizer

Equipment Schedules Continued On H-10

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

HVAC Equipment Schedules

REVISIONS

1/26/24
3/11/24

DATE: 10/20/23

PROJECT NUMBER: 19-13

SHEET NUMBER: H-9

HVAC Legend

COND	Condensate piping
DHWS	Domestic Hot Water supply
DHWR	Domstic Hot Water return
GSS	Ground Source supply
GSR	Ground Source return
PRV	Pressure reducing valve, set at 30 psi
BFP	Back flow preventer, Watts 9D
RPZ	Reduced pressure backflow preventer
WM	Water Meter
PR	Pressure Relief
S	Strainer
GS	Ground Source fluid
GHX	Ground Heat Exchanger
DHW	Domestic Hot Water
	Valve, 1/2"-2" ball, 2 1/2" up rising stem gate
	Valve, check
	Valve, balancing
CV	Valve, control, as designated
	Union
	Air supply
	Air Return
	Transition
	Volume damper
DM	Damper motor
	Air damper
FD	Fire damper
RD	Radiation Damper
AD	Access door
UTR	Up Through Roof
PT	Pressure and temperature tap
T	Thermometer and well
Ⓣ	Thermostat, mount 48" AFF
Ⓟ	Pressure Gauge with snubber and shut off cock

Energy Recovery Ventilator (HRV / ERV):

Mark	Manufacturer	Model	CFM	External Static "H2O	Efficiency At 32F, (%)	HP	Voltage	Provide	Application
ERV-1	RenewAire	HE-2XINH	1095	0.60	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	1st Floor South
ERV-2	RenewAire	HE-2XINH	1570	0.60	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	2nd Floor South
ERV-3	RenewAire	HE-2XINH	1570	0.60	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	3rd Floor Sounth
ERV-4	RenewAire	HE-2XINH	1450	0.60	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	2nd Floor North
ERV-5	RenewAire	HE-2XINH	1375	0.60	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	3rd Floor North
ERV-6	RenewAire	HE-3XRT	2000	0.60	70	(2) 2 HP	208 V,3Ph	1, 2, 3, 4, 5, 6	Atrium
ERV-7	RenewAire	HE-2XINH ECM	1770	0.40	70	(2) 1-1/2 HP	208 V,3Ph	1, 2, 3, 5, 6	Restaurants
ERV-8	RenewAire	HE-1XINH ECM	650	0.40	70	(2) 1/2 HP	208 V,1Ph	1, 2, 3, 5	Commercial 1
ERV-9	RenewAire	EV-450IN ECM	360	0.40	70	(2) 1/2 HP	208 V,1Ph	1, 2, 3, 5	Commercial 2
ERV-10	RenewAire	HE1.5XINH ECM	940	0.40	70	(2) 1 HP	208 V,1Ph	1, 2, 3, 5, 6	Farmer's Market

Provide:
1.) Operates with CO2 Controller
2.) ECM Motor
3.) Enhanced controls
4.) VFD Drive
5.) CO2 Controller
6.) Premium Efficiency Motor

Auto Balance Dampers:

Mark	Manufacturer	Model	CFM	Application
ABD1	Greenheck	ABD-5	70	Apartments
ABD2	Greenheck	ABD-8	295	Restaurants
ABD3	Greenheck	ABD-6	75	Lobby West
ABD4	Greenheck	ABD-5	55	Management
ABD5	Greenheck	ABD-5	55	Lobby middle
ABD6	Greenheck	ABD-6	325	Commercial 1
ABD7	Greenheck	ABD-8	360	Commercial 2
ABD8	Greenheck	ABD-6	200	1st Floor Men Bathroom
ABD9	Greenheck	ABD-6	100	1st Floor Woemen Bathroom
ABD10	Greenheck	ABD-6	235	Farmer's Market
ABD11	Greenheck	ABD-6	240	Corridor 2nd S
ABD12	Greenheck	ABD-6	235	Community Rm
ABD13	Greenheck	ABD-6	200	Corridor 2nd N
ABD14	Greenheck	ABD-6	240	Corridor 3rd S
ABD15	Greenheck	ABD-8	255	Corridor 3rd N
ABD16	Greenheck	ABD-5	30	Elev. Lobby North

Electric Heater:

Mark	Manufacturer	Model	BTU/Hr	KW	Voltage	Provide	Application
EH-1	Dimplex	T23WH1011CW	3,412	1.00	120 V- 1 phz	1	
EH-2	Dimplex	T23WH1511CW	5,118	1.50	120 V- 1 phz	1	

Provide:
1.) Fire rate around heater

Pumps:

Mark	Manufacturer	Model	GPM	Head Ft.	Fluid BHP	Motor HP	Voltage	Provide	Application
P-2	Taco	SKV3006D-1760-2	140	30	1.29	2.0	208- 3 Phz	1, 2, 4, 7, 10	GHX
P-3	Taco	SKV3009D-1760-5, eO	210	50	3.45	5.0	208- 3 Phz	1, 2, 4, 8, 9, 10	Building
P-4	Taco	1615-1750-.75 (NSF-61)	35	30	0.50	0.75	208- 1 Phz	3, 5	DHW HP 1
P-5	Taco	009-SF5	4	22	1/8	1/8	120- 1 Phz	3, 6	DHW HP 2

Provide:
1.) Variable speed controller
2.) Suction and discharge flex connectors
3.) Starter
4.) Verticle support stand
5.) NSF-61 construction for potable water
6.) Stainless steel construction for potable water
7.) Pump operates with fluid temperature, see sequence of operation.
8.) Pump operates with system flow/pressure curve, see sequence of operation.
9.) Provide Taco eO, ECM motors.
10.) Pump Motor to be labeled "Premium Efficiency".

DHW Storage Tanks:

Mark	Manufacturer	Model	Gapacity Gals.	Provide
DHWT	AOS	TJV-120M	119	1, 2, 3

Provide:
1.) Insulated Tank
2.) T&P Valve
3.) DHWT Set Points:, #1=100, #2=130,#3=140.

Antifreeze Makeup Tank And Pump Package:

Mark	Manufacturer	Model	Gapacity Gals.	Flow GPM	Head Ft.	HP	Voltage	Provide
AFT	Wessels	GMP-13050	3	1	35	1/3	120	1, 2, 3, 4

Provide:
1.) T&P Valve
2.) Vent
3.) Low solution alarm
4.) Set pressure to 35 psi.

Water Treatment Tank:

Mark	Manufacturer	Model	Provide
WTT	General Filtration	PF5XHP	

Air Separator:

Mark	Manufacturer	Model	Provide
AS	Taco	AC6F	1, 2

Provide:
1.) Vent
2.) Strainer

Mixing Valve:

Mark	Manufacturer	Model	Size (in)	Flow (GPM)	DP (PSI)	Provide
MV	Powers	LFIS200VL	2	80	5	1

Provide:
1.) Set point is 110 degrees F.

Expansion Tanks:

Mark	Manufacturer	Model	Acceptance	Provide	Application
XT-1	Amtrol	ST-452C	137	1	DHW
XT-2	Taco	CAX130-125	19	1	GS Fluid

Provide:
1.) ASME construction, replacable bladder

Controls:

Balance Valves	Taco Accu-Flow, size per plan
CP	Condensate pump, Liberty model LCU-20S, 5 GPM, 15' H2O, 120 V.
DHW	Honeywell model T775B2032/U, 2 stage, 2 sensor input, electronic thermostat, provide 24 volt transfrmer.
Aquastat	Provide additional sensor model 50021579-001.
CO2	Duct mounted CO2 sensor ventilation controller, Honeywell model C7232B1006/U. Wall mounted CO2 sensor ventilation controller, Honeywell model C7232A1016/U. Provide transformers as required.
DM	Dampers, class 1 motorized low leakage dampers, 4.0 cfm/sqft @ 1.0 "H2O. Voltage to mach application, provide transformers as required. Actuator Honeywell model M6184A1015, 150 in. lbs, 24 volts.
Relief-Damper	Greenheck Model HPR-1, standard, class 1 low leak horizontal damper, set to open at 0.1" H2O.
Hose Kit	Hose Connector kits to include strainer, automatic balance valve, inlet and outlet P/T ports, flow control valve. Flow control valve to be Belimo motorized 24 volt operated valve with 75 psi close off capability.
P/T	Peet's Plug, temperature and pressure tap with sealed cap.
PRV	Pressure reducing valve Taco model 329-3/4".
Smoke-Damper	Nailer Model 1290-FS-8", class 1 at 250 deg. F, 2000 fpm. Actuator: Honeywell model MS4104F1210, 30 in#, end switches, 120 volt, provide 24 volt relay and transformer. Provide 205649 mounting bracket and labeled damper position indicator LED light (24 volts), mounted on wall.
T1	Wall mounted 7 day electronic programmable commercial thermostat, Honeywell model TB722U1012, 2H/2C stages, with multi speed fan and occupied/unoccupied contacts. Provide opaque metal cover.
T2	Wall mounted 5-2 day electronic programmable residential thermostat, Honeywell model TH6220D1002, 2H/2C stages, Provide opaque metal cover.
WEB	WEL model WEB Data Monitor, (10) SS sensors, power supply. Provide CAT-5 ethernet cable to internet terminal. Connect sensors (T), (FM) as shown in DHW and Mechanical room riser diagrams. Provide all setup of data monitor.
Flow Meter	(FM) Micronics model U1000MKII-FM, 4-20ma output, provide 24V transformer and setup.

HVAC Notes:

1.) a. Install all equipment per the manufacturer's installation instructions.
b. All installation and service to be by manufacturer trained personel.
c. Provide ARHI Certificates with refrigerant bearing equipment submittals.
d. All electric equipment to be listed by an approved testing laboratory; UL, ETL or Equal.

2.) a. See typical unit for apartment HVAC ductwork layout and details.
b. All sheet metal elbows and tees are to have turning vanes.
c. Ductwork to be sealed at all transverse joints, longitudinal seams and wall penatrations with approved mastic backed aluminum tape.
d. Ductwork to be inspeced by HERS rater before being covered by walls.
e. Leak test office and common area ductwork, leakage rate shall be less than 6% of equipment air flow at .1"H2O duct test pressure.
f. Leak test dwelling unit ductwork, leakage rate shall be less than 6cfm/100 sqft total, of dwelling net area at .1"H2O duct test pressure.
g. Leak test dwelling unit ductwork, leakage rate shall be less than 4cfm/100 sqft to outdoor spaces, of dwelling net area at .1"H2O duct test pressure.
h. Insulate all ductwork per the specification.
i. Provide fire dampers and access doors at all duct penatrations in ceiling/floor and fire walls.
j. Provide ceiling radiation dampers at all grill penatrations in ceilings.
k. The HVAC design for all buildings incorporates metal ducted supplies, returns and vents. No building interstitial framed cavties are to be used for air flow or venting
l. All supply, return, bathroom and kitchen exhaust ductwork to be temporarily sealed after installation.
m. Provide air pressure and temperature test holes and plugs in equipment supply and return plenumn. Contractor to obtain air pressure and temperature instrument for testing and set up.
n. Roof curbs to be 24" high, secure to roof structure and equipment.
o. Air handler air filters and access plate to be sealed with gasket.
p. Provide smoke dampers where designated, coordinate with fire alarm contractor.

3.) a. All Gypsum board penatrations in rated walls & floors to be fire sealed with UL system approved specifically for the penatrating item and assembly type.
b. All roof penatrations and flashings are to be performed by the roofing contractor.

4.) a. Building ground source (GS) hydronic piping to be SDR-11, polypropylene with fiberglass reinforcement fibers.
b. See Ground Source piping detail for hydronic pipe sizes and details.
c. See Ground Source DHW piping detail for plumbing pipe sizes and details.
d. Hydronic pipe temperature and temperature testing taps to be provided using Peet's Plugs with sealed caps. Contractor to obtain Peet's Plug pressure and temperature testing instrument for set up and testing.
e. Provide expansion offsets and loops as required by manufacturer.
f. All mechanical piping in the mechanical room is to be below the ceiling.

5.) a. Do not open the GHX isolation valves until the Building GS loop has been filled with antifreeze.
b. Antifreeze to be the same as placed in the GHX system.
c. Provide a 23% by volume propylene glycol antifreeze solution, (specific gravity SG=1.020 @ 60 deg.F.) after all flushing and purging of building GS loops and cleaning of strainers.
d. Total volume of building GS loop system is 765 gallons.

6.) a. Mount all control sensors as required by the control manufacturers.
b. Control substitution must meet the minimum requirements of the specified controller.
c. See GHX pump control detail and sequence of operation for control details.
d. All air moving equipment shuts down upon a fire alarm signal provide relays as required.

7.) a. Provide data monitor, flow meter wiring and setup of devices.
Well model Web Data Monitor, (10) SS sensors, power supply.
Provide CAT-5 ethernet cable to internet terminal.
Connect sensors to pipe as shown in DHW and Mechanical room riser diagrams.
Provide all setup of data monitor.
b. Flow meter: Micronics model U1000MKII-FM, provide 24V transformer and setup.

8.) a. Refrigerant piping must be protected during construction to prevent debris contamination by either capping or covering the ends of piping during installation.
b. Nitrogen pressure testing and system vacuum evacuation per manufacturer's testing procedures must be included and must be completed prior to system charging.
c. Refrigerant pipe insulation must be installed per 2020 NYS ECCC requirements and any insulation exposed to the exterior must be provided with PVC or aluminum jacketing to protect pipe insulation.
e. System refrigerant charging must be performed per manufacturers' requirements and be calculated based on as-built refrigerant pipe lengths. Final charge weight should be documented in start-up documentation, O&M manuals, and/or on the equipment itself.
f. Provide set up and programming of controls and thermostats as required by manufacturer qualified technicians.
g. Purge debris from hydronic pump screens after 1 hour of system operation.

9.) a. HVAC contractor to employ a credentialled 3rd party contractor credentialled by an agency listed in the link below
https://www.energystar.gov/partner_resources/residential_new/working/other_participants#ftas
b. Test and document each HVAC system and record data in the latest version of the Energy Star Commissioning Check List.
c. Air and water flow balancing adjustments to specifications are to be performed.
d. Air and water flow and pressures across equipment are to be adjusted per equipment schedules and reported to the engineer for approval.
e. Energy code HVAC certification process to be provided by an approved independent certification contractor and final report to be approved by the engineer and building official.

10.) a. Provide all equipment specifications and O&M manuals to owner in electronic format.
b. Instruct owner's representative on thermostat and all equipment operation and maintenance.
c. Instruct owner's representative on the operation of the GHX system.

11.) a. Before any excavation, obtain a utility markout, digsafelynewyork.com or call 811.

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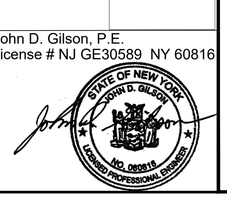

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

HVAC Equipment Schedules, Notes and Legend

REVISIONS

1/26/24
3/11/24

DATE
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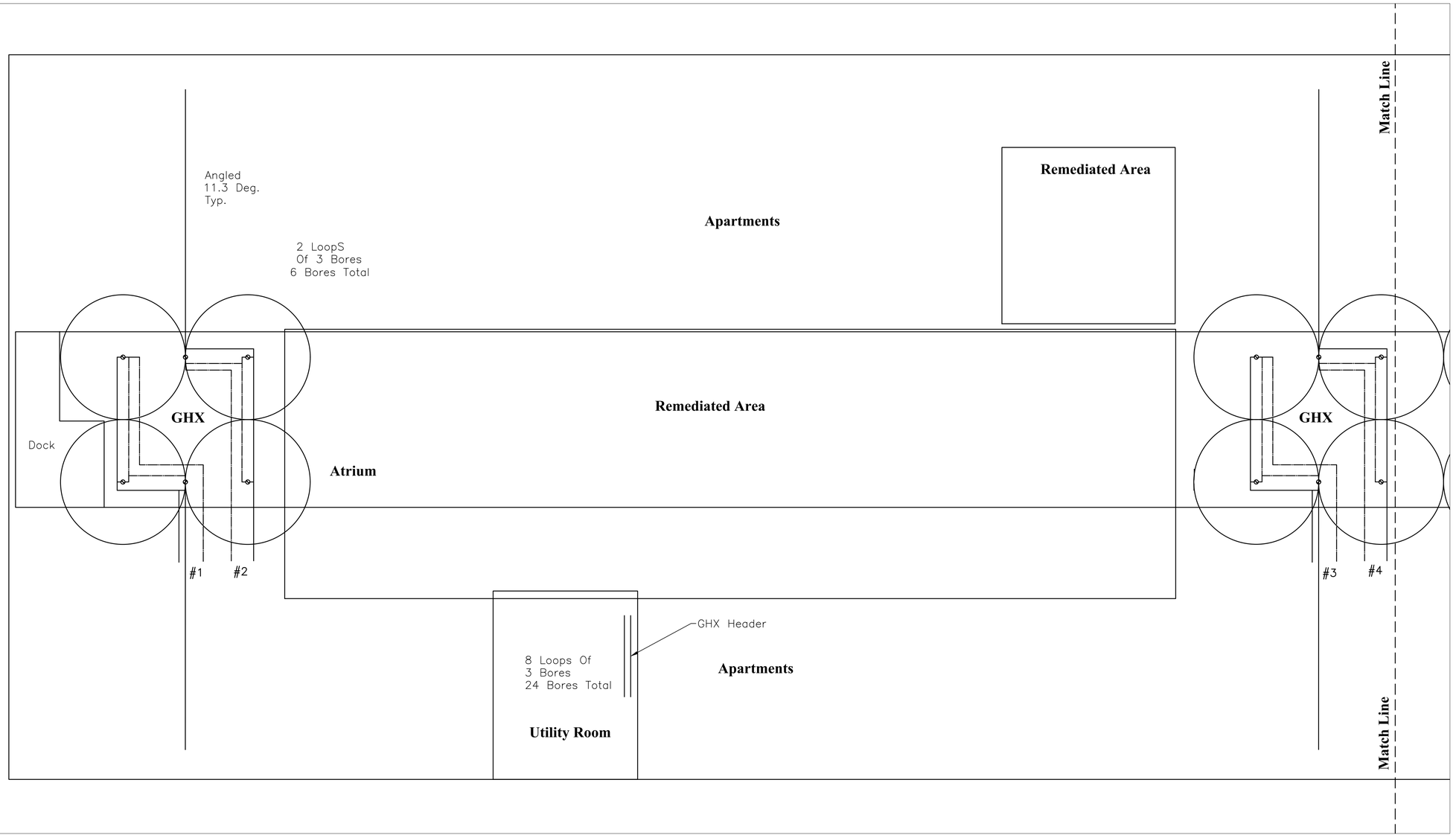
19-13

SHEET NUMBER
H-10



1 GHX Layout

GHX1 Scale: 3/32"=1'

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GHX Layout

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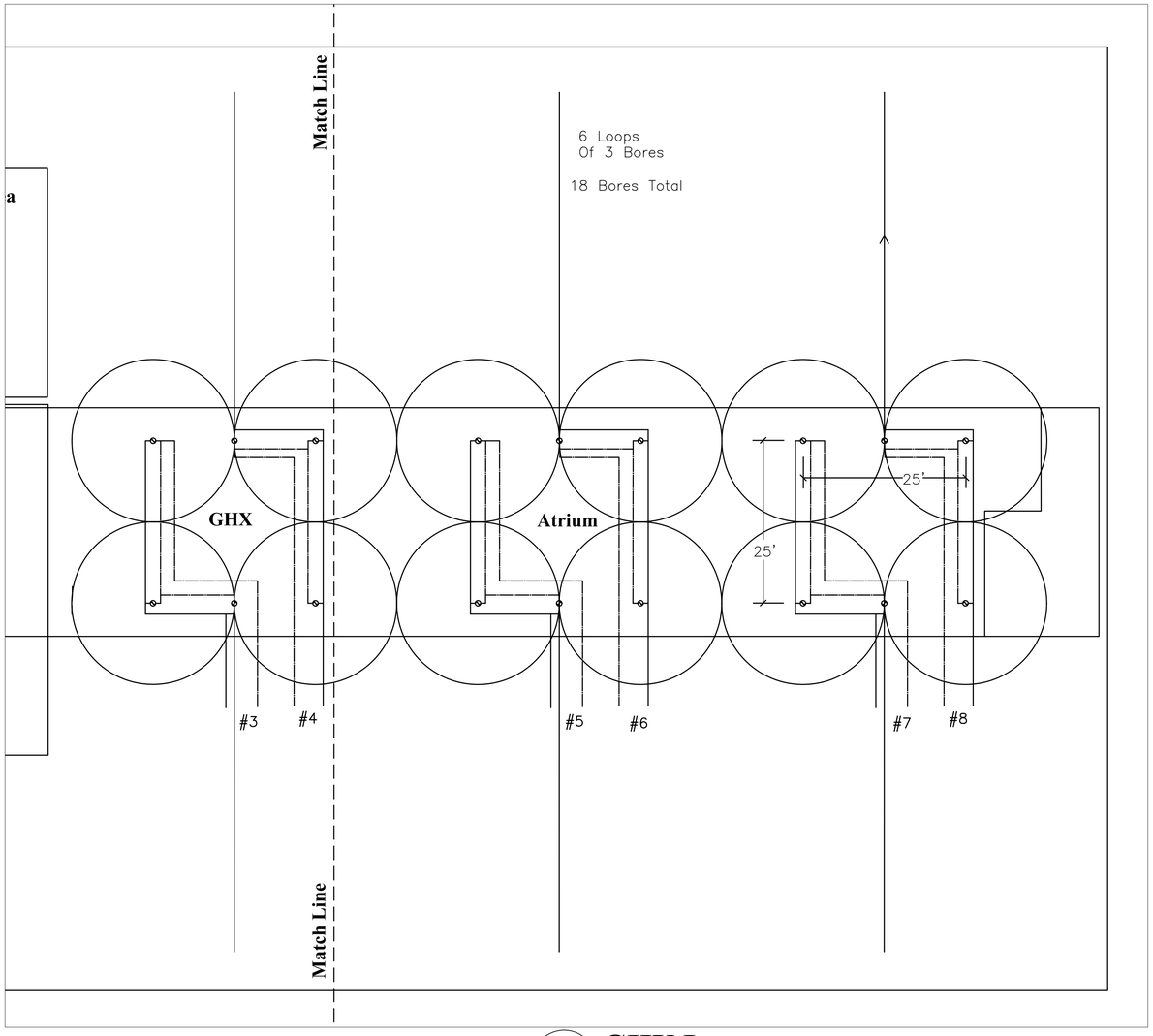
GHX1



1 GHX Layout
GHX2 Scale: 3/32"=1'

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GHX Layout

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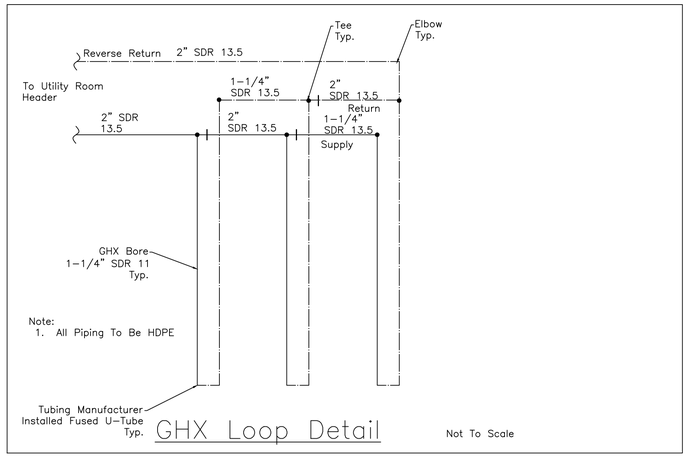
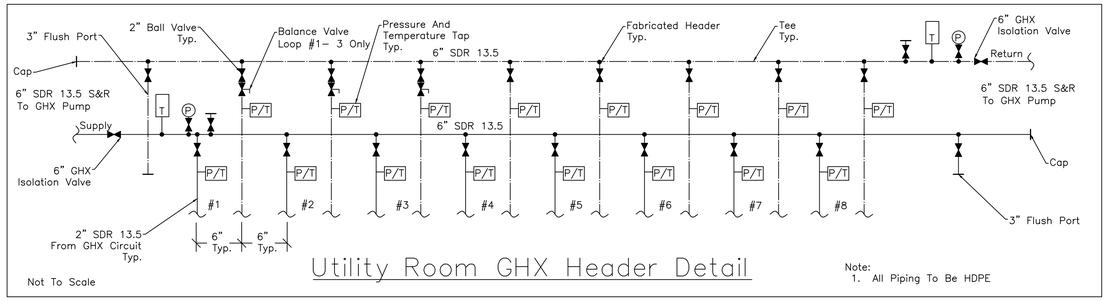


GHX Loop Detail

Not To Scale



Utility Room GHX Header Detail

Not To Scale

Note:
1. All Piping To Be HDPE

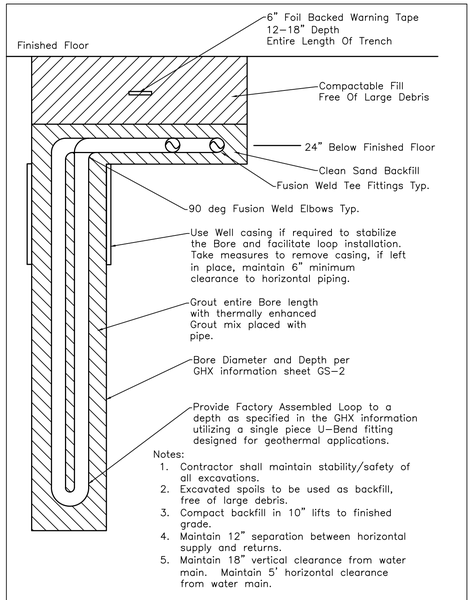
GHX Specifications

Bore Depth	270'
Bore Diameter	5" min.
Bore Spacing	25' Nominal
	10' Minimum to property line
	3' Minimum to Foundation
Number Of Loops	8
Grout Conductivity	1.6 BTU/Hr Foot Deg F

23% Propylene Glycol Solution By Volume (SG=1.020 @ 60deg.F.)

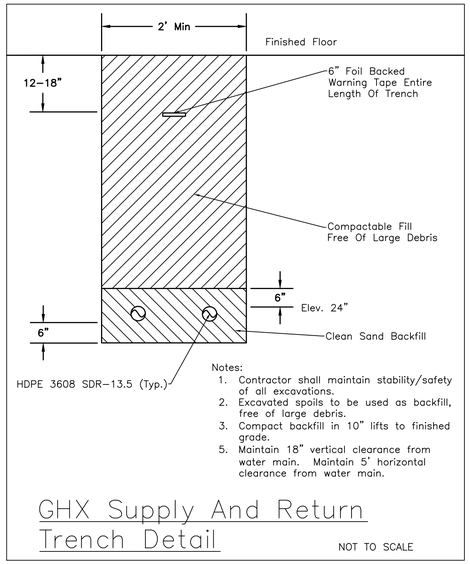
GHX volume	1,670 Gallons
Propylene Glycol	385 Gallons
Nominal Flow/Loop	17.5 GPM
Total GHX Flow	140.0 GPM
Nominal Pressure	12.9 Ft H20
Purge Flow/Loop	30.2 GPM
Purge Pressure drop	29.3 Ft H20, plus connection hose pressure

See Specification Section 15710 For Further Requirements



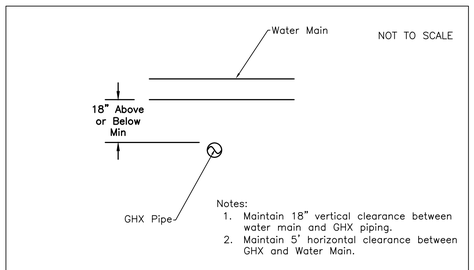
GHX Bore And Piping Detail

NOT TO SCALE



GHX Supply And Return Trench Detail

NOT TO SCALE



GHX Water Main Crossing

Ground Heat Exchanger (GHX)

Notes:

1. GHX Design may be revised due to the geological thermal testing result.
2. All connections between piping in ground loop GHX shall be using heat fusing in accordance with IGSHPA.
3. Contractor shall pressure test GHX piping, completed joints and assemblies with air in accordance with IGSHPA protocols, by an IGSHPA- certified contractor prior to backfilling of trenches.
4. Contractor shall assign numbers to all circuits comprising the GHX and label the manifolds with those circuit numbers and supply and return for each.
5. Prior to commissioning GSHP system, contractor shall:
   a. Flush the GHX of contaminants, dirt and other debris with potable water.
   b. Purge the GHX of air by flushing the ground loop at pump rates shown on bore circuit piping detail on sheet GHX-3.
5. Verify GHX performance (pressure/flow). IF design verification does not reasonably agree with theoretical values, check for possible blockage or restriction.
6. Flush debris, contaminants, dirt etc. from inside piping, pumping, and GSHP units and clean filters
7. Purge air from inside piping, pumping and GSHP units.
8. Position or open valves to combine the GHX and inside piping, and GSHP units into one continuous flushing operation.
9. Charge the system with 23% by volume Propylene Glycol anti-freeze solution.
10. Pressurize the water side (if a pressurized flow center is used).
11. Contractor shall to employ a 3rd party NYS Clean Heat contractor to commission system and complete a commissioning checklist that satisfies National Grid clean heat program requirements.
12. Before any excavation, obtain a utility mark-out, digsafelynyeyork.com or call 811.
13. See Specification Section 15710 For Further Requirements.

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GHX Details

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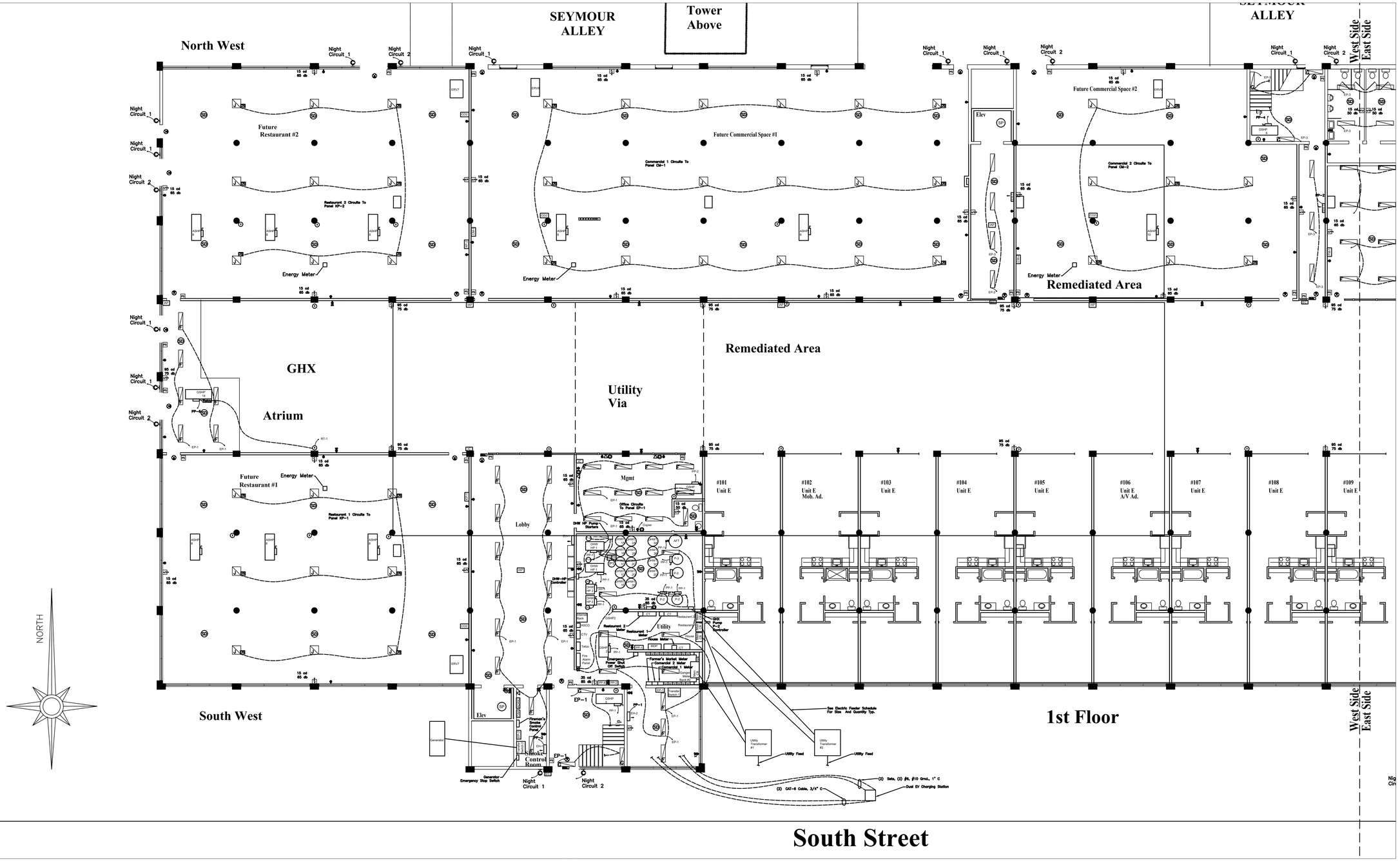
GHX3



1 First Floor Electric Plan

E-1W Scale: 3/32"=1'-0"

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First Floor Electric West

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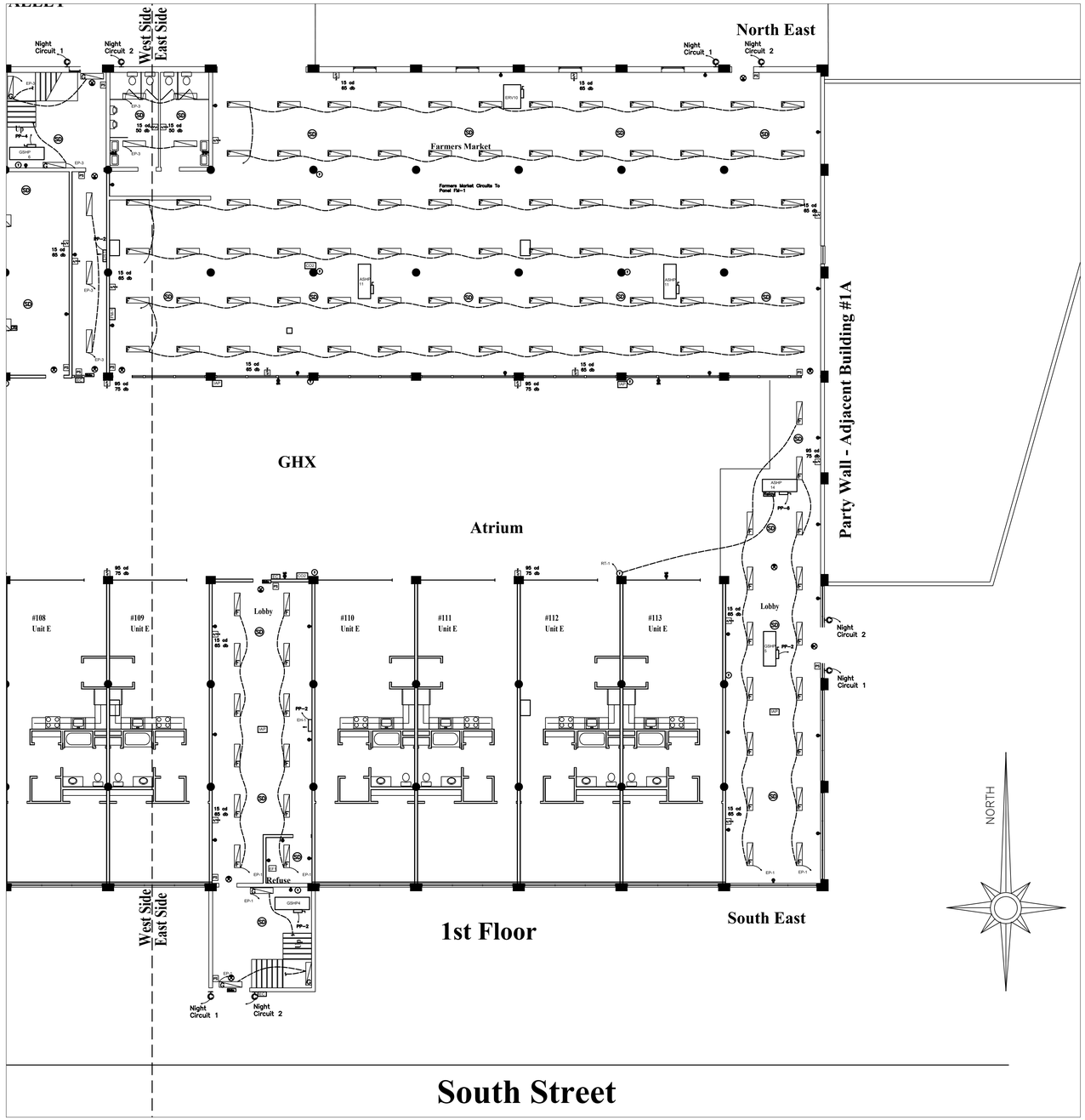

1 First Floor Electric Plan
E-1E

Scale: 3/32"=1'-0"

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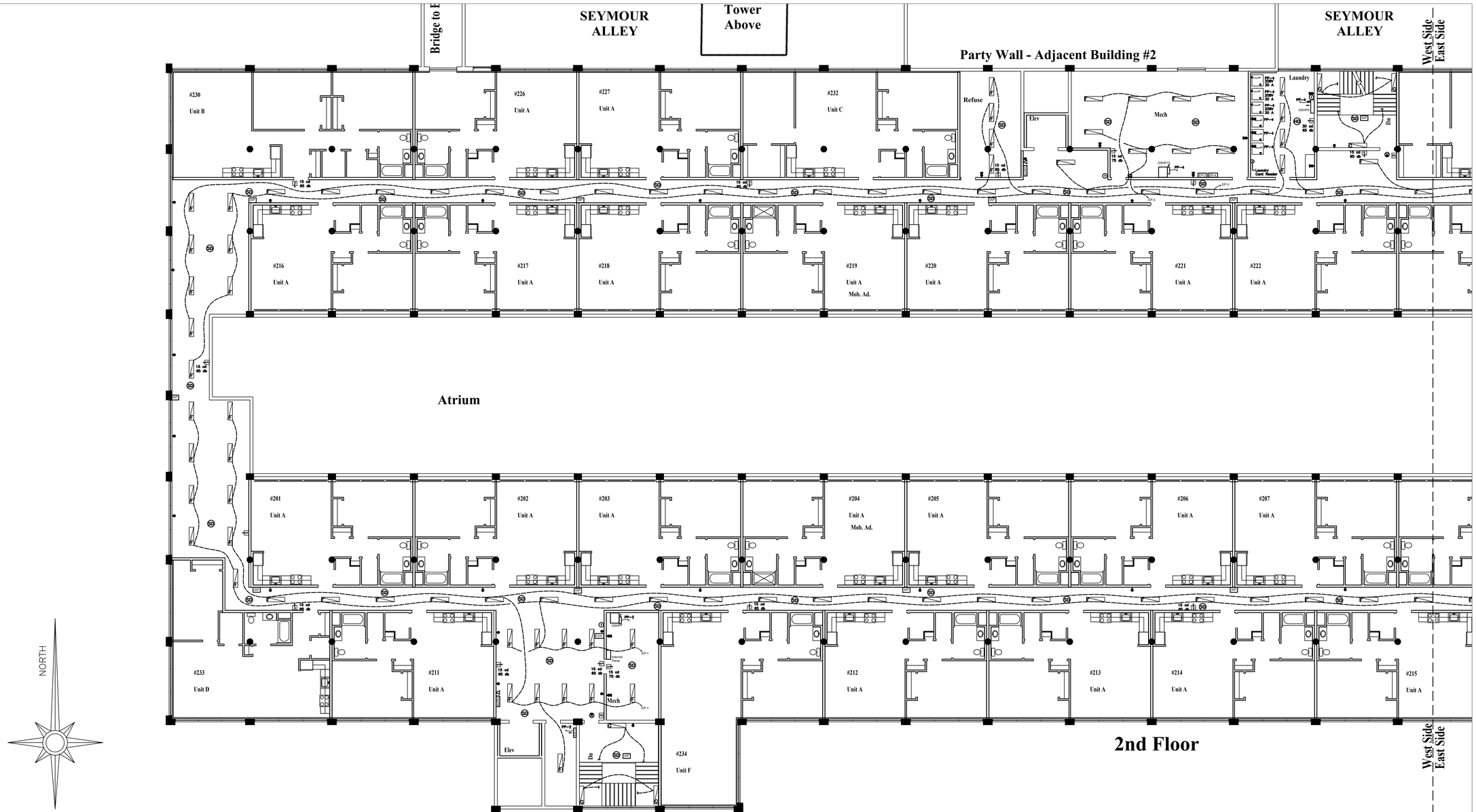

1 2nd Floor Electric Plan

E-2W Scale: 3/32"=1'-0"

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Harrison Place Lofts

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REVISIONS
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3/11/24

DATE
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20-30

SHEET NUMBER
E-2W

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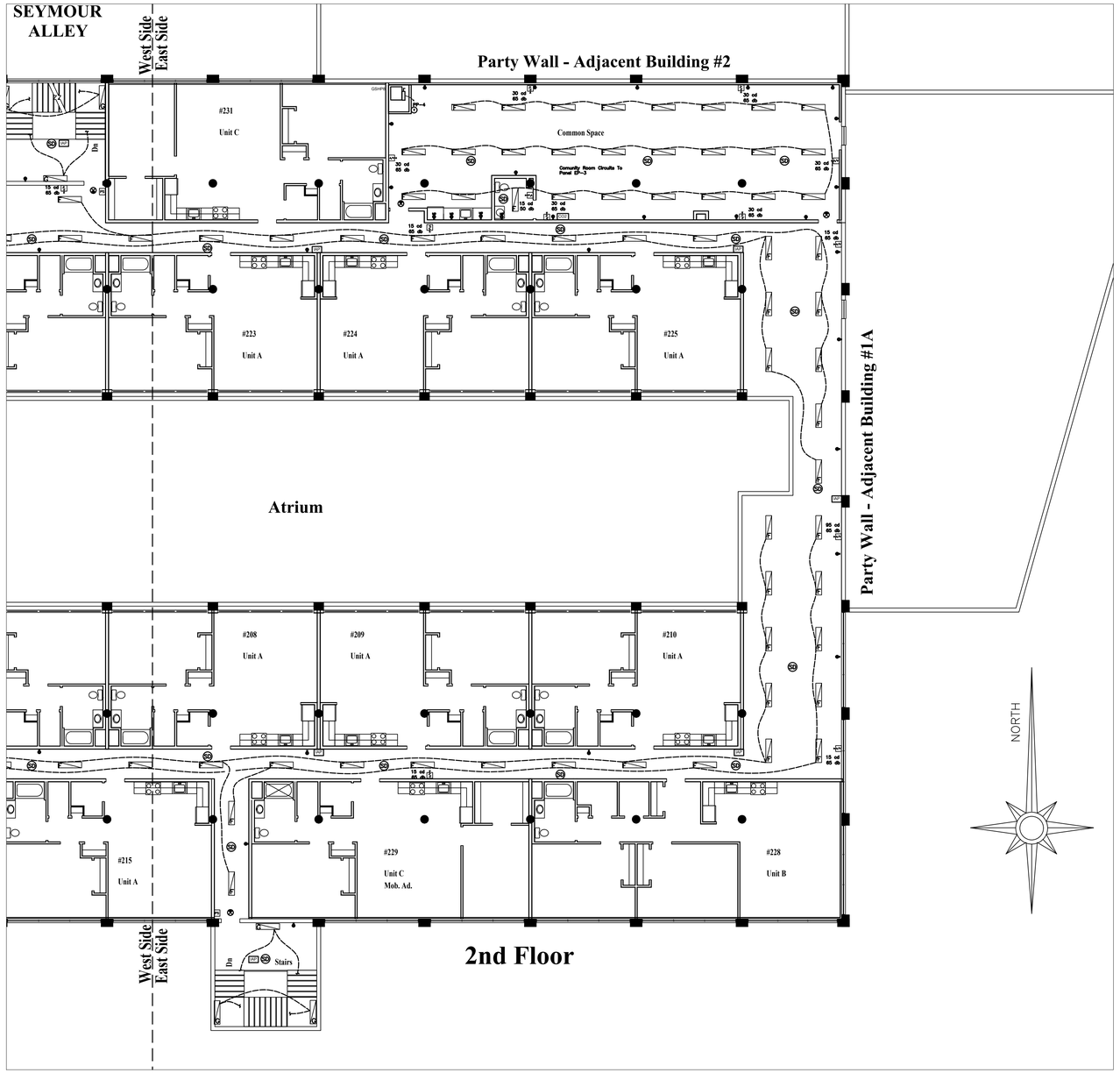

1 E-2E Second Floor Electric Plan

Scale: 3/32"=1'-0"

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Harrison Place Lofts

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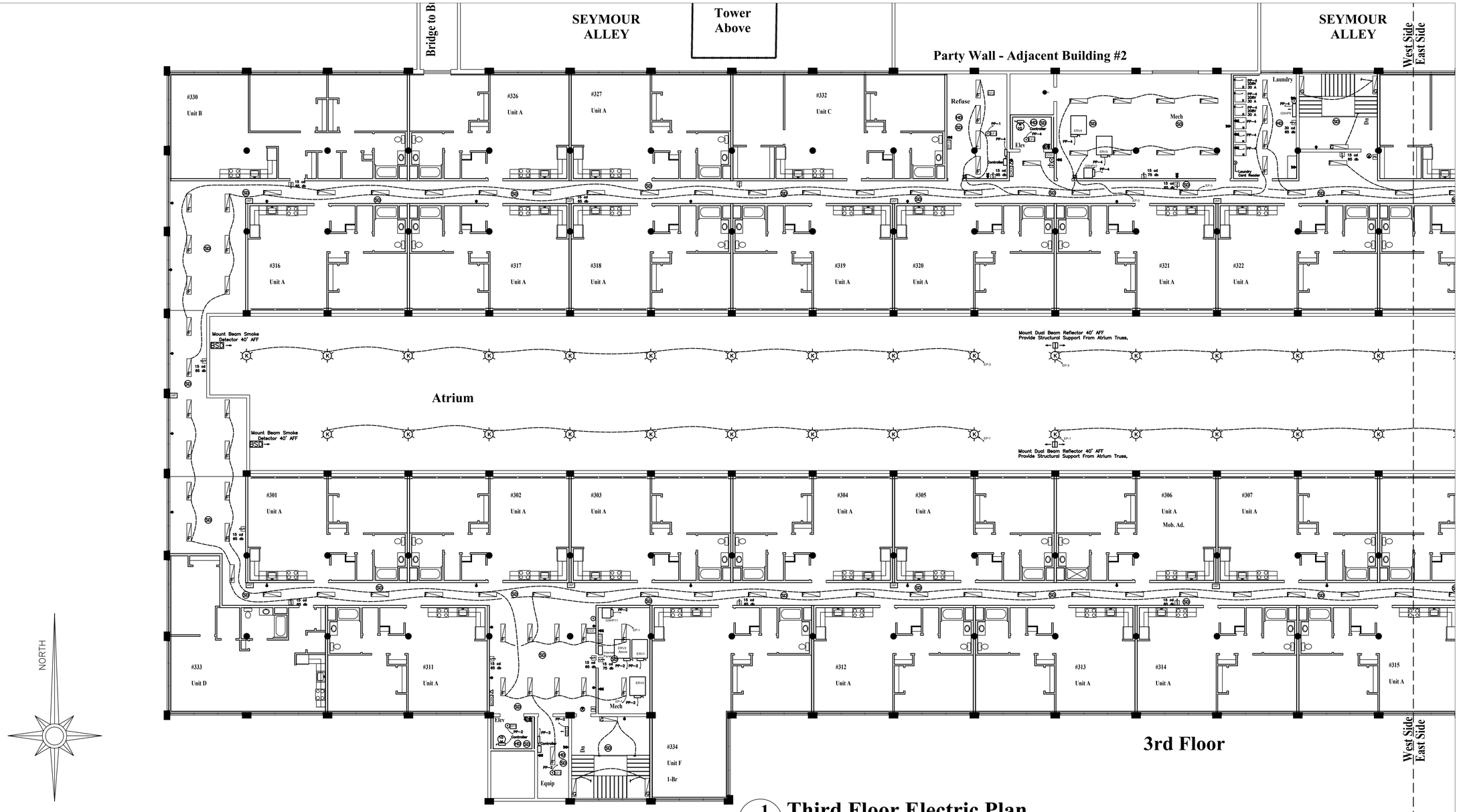

1 Third Floor Electric Plan
E-3W Scale: 3/32"=1'-0"

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Harrison Place Lofts

210 Walnut Street, Lockport, NY

Third Floor Electric West

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-3W

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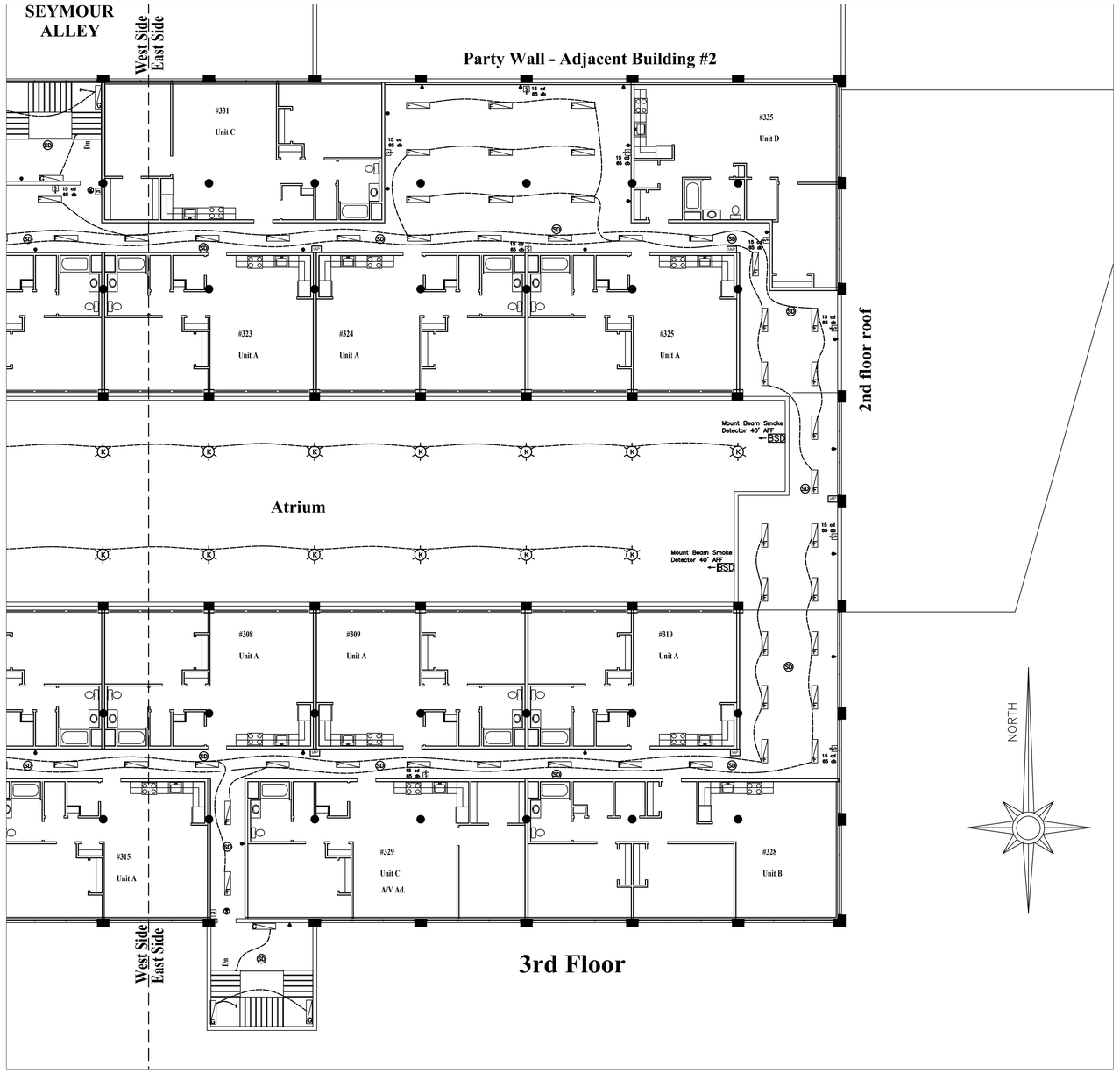

1 E-3E Third Floor Electric Plan

Scale: 3/32"=1'-0"

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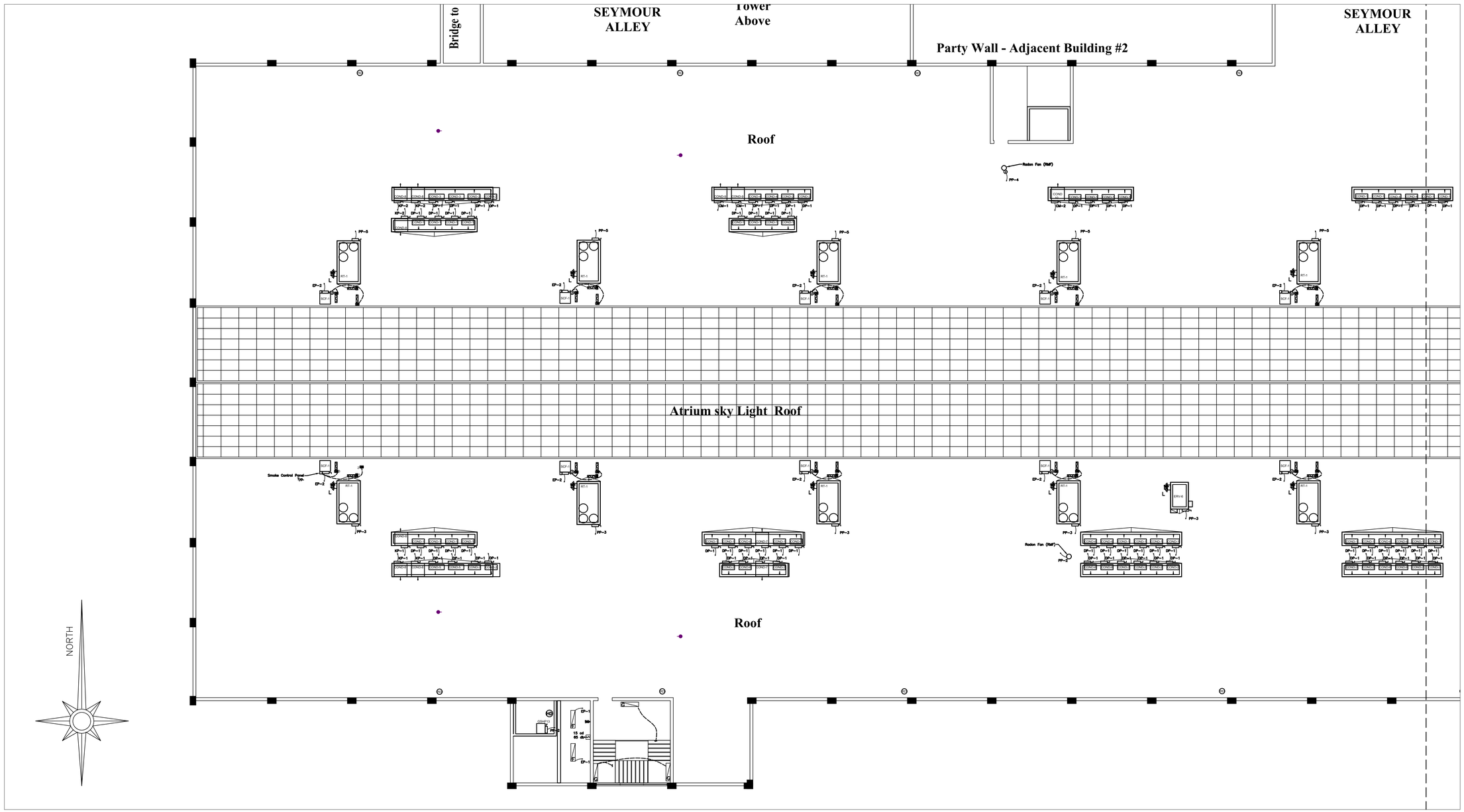
SHEET NUMBER
E-3E



1 Roof Electric Plan

E-4W Scale: 3/32"=1'-0"

COPPOLA ASSOCIATES

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ajcoppola@coppola-associates.com

° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

Roof Electric West

REVISIONS

1/26/24
3/11/24

DATE

10/20/23

PROJECT NUMBER

19-13

SHEET NUMBER

E-4W

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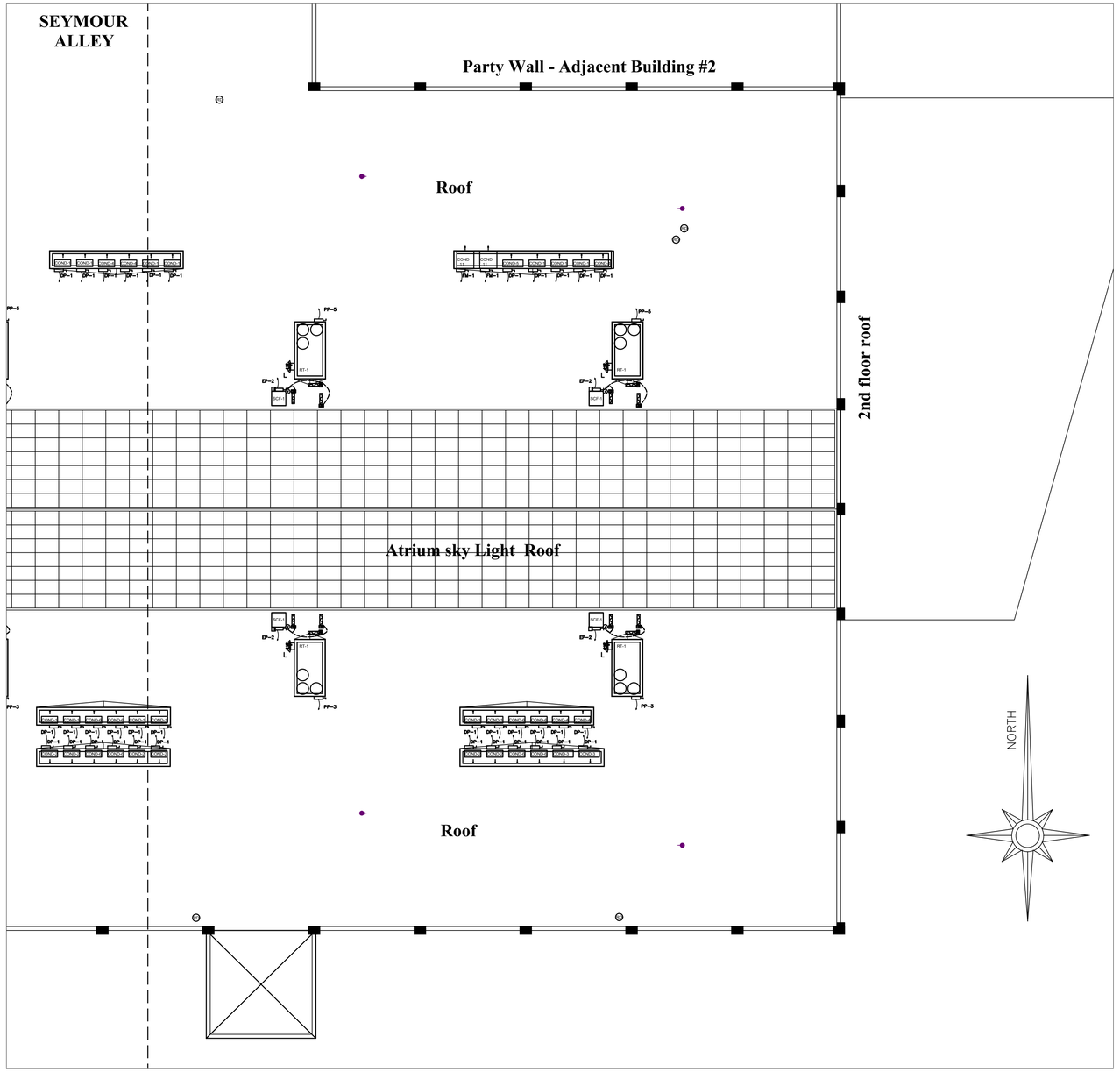
License # NJ GE30589 NY 60816

STATE OF NEW YORK · JOHN D. GILSON · NO. 060816 · LICENSED PROFESSIONAL ENGINEER



1 E-4E Roof Electric Plan

Scale: 3/32"=1'-0"

COPPOLA ASSOCIATES

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

Roof Electric East

REVISIONS

1/26/24
3/11/24

DATE: 10/20/23

PROJECT NUMBER: 19-13

SHEET NUMBER: E-4E

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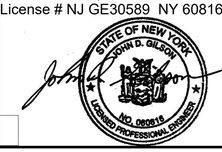
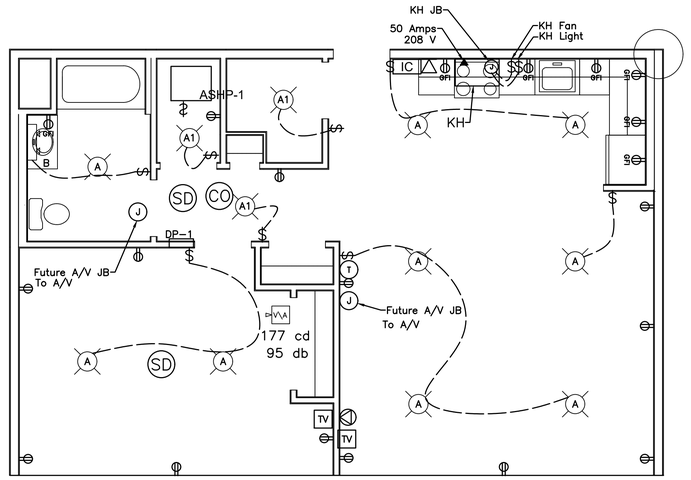
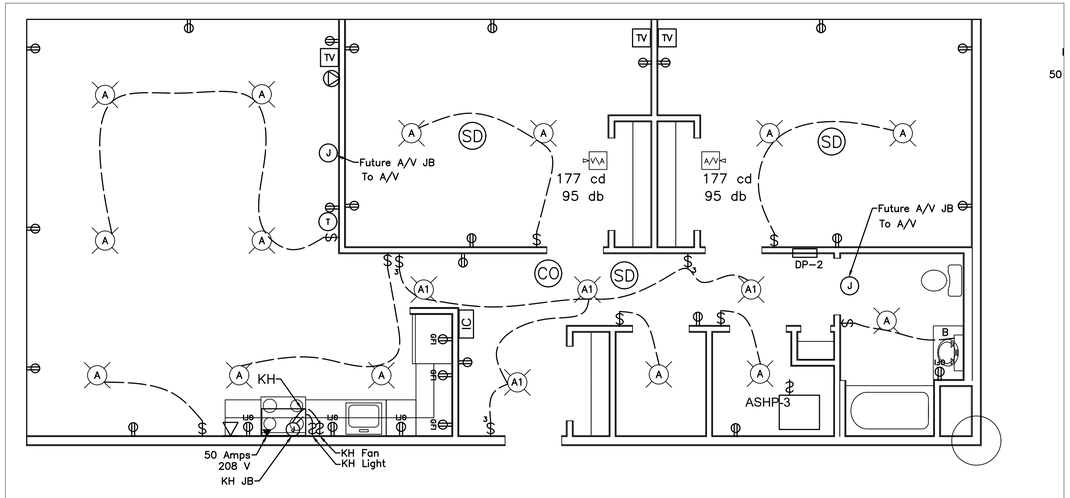




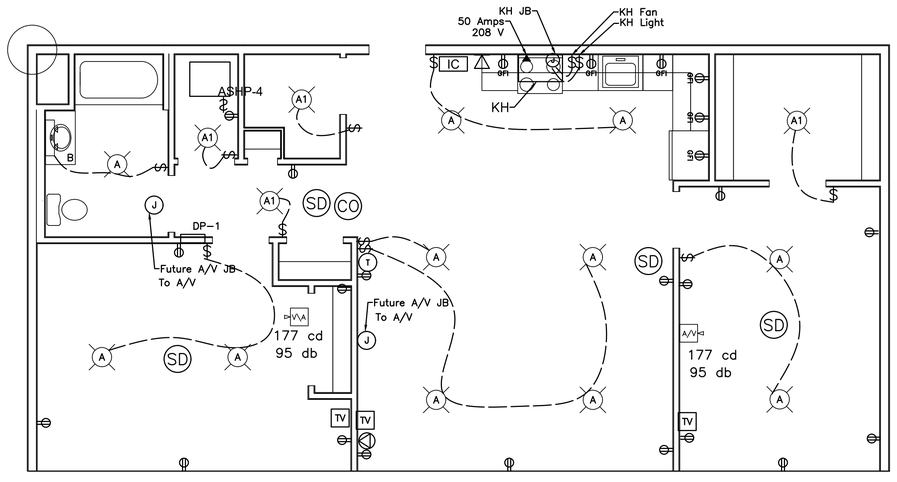
1 E-5 Unit A Electric Plan

Scale: 1/4"=1'-0"



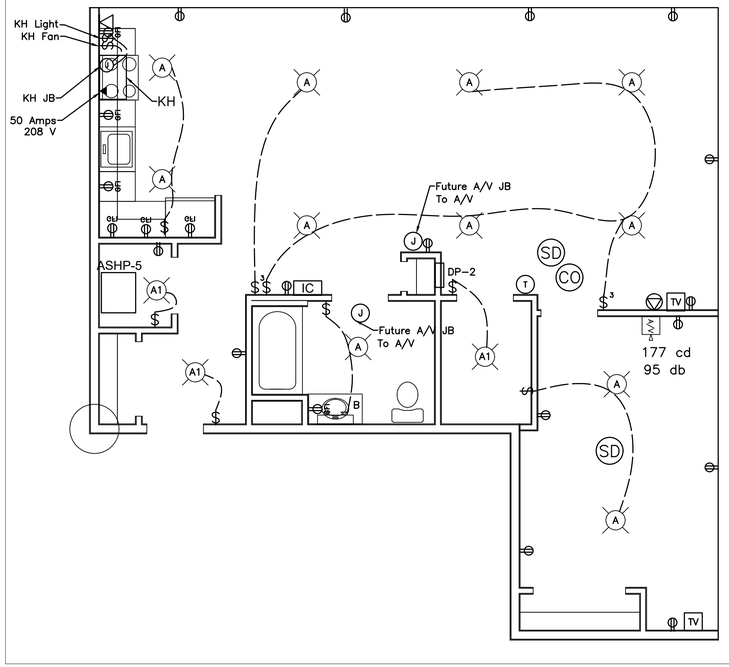
2 E-5 Unit B Electric Plan

Scale: 1/4"=1'-0"



3 E-5 Unit C Electric Plan

Scale: 1/4"=1'-0"



1 E-5 Unit D Electric Plan

Scale: 1/4"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

Typical Unit Electric Plans

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-5

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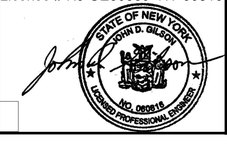
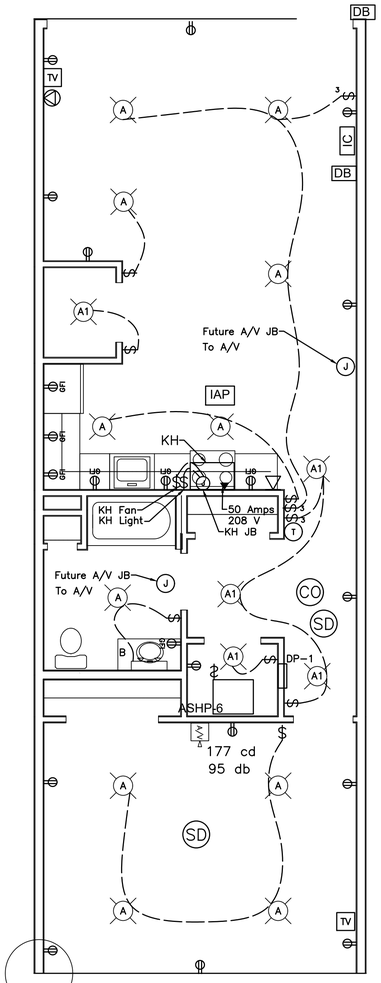
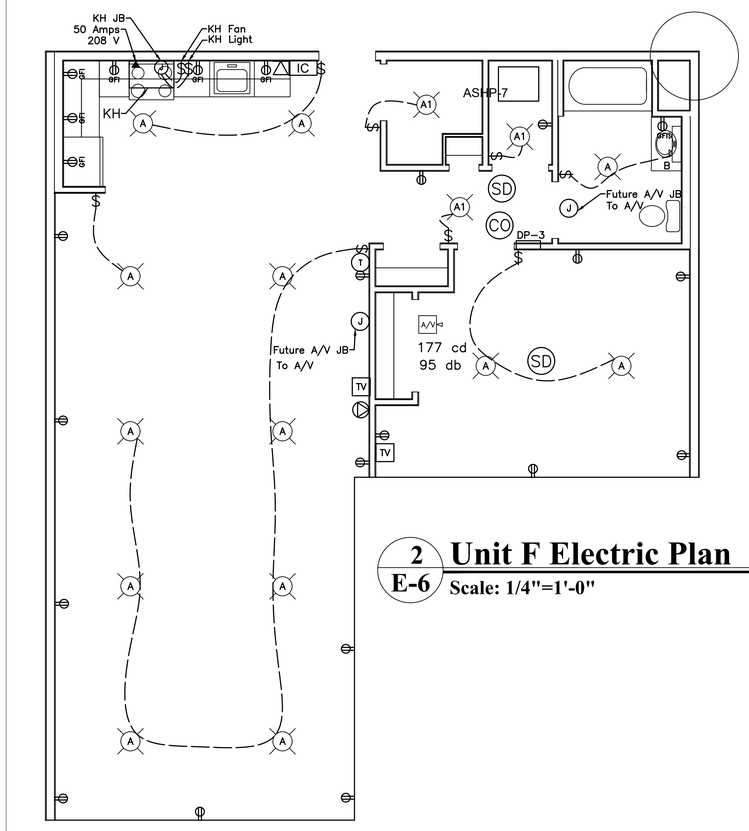




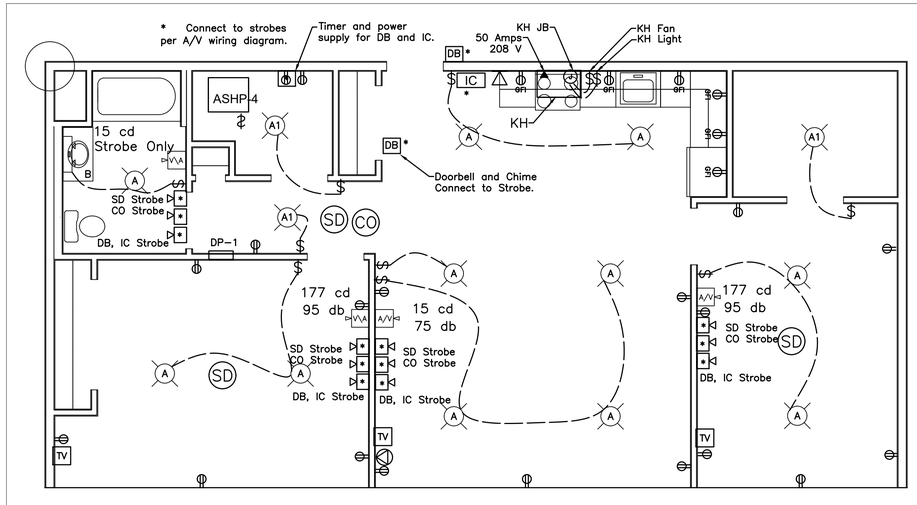
1 E-6 **Unit E Electric Plan**

Scale: 1/4"=1'-0"



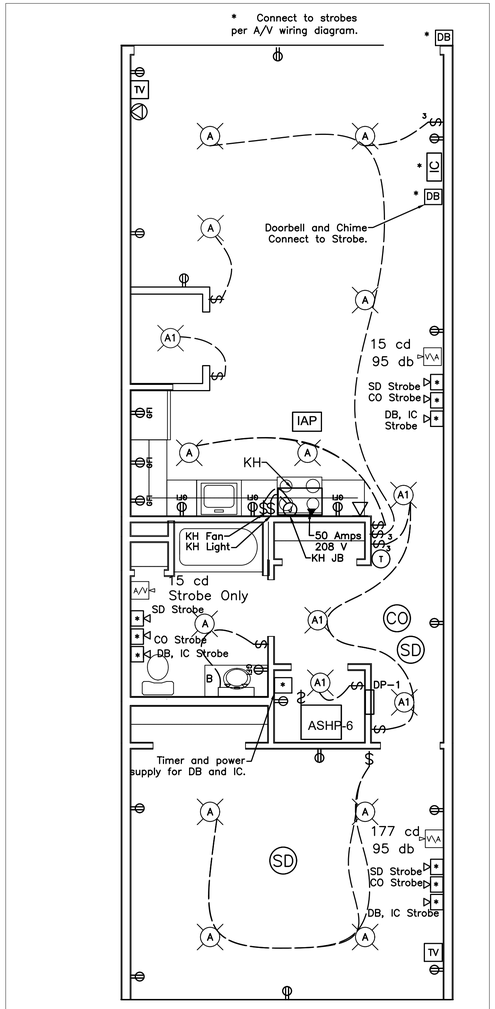
2 E-6 **Unit F Electric Plan**

Scale: 1/4"=1'-0"



4 E-6 **A/V Impaired Unit C Electric Plan**

Scale: 1/4"=1'-0"



3 E-6 **A/V Impaired Unit E Electric Plan**

Scale: 1/4"=1'-0"

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street,
Lockport, NY

Typical Unit Electric Plans

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-6

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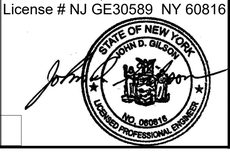


Lighting Schedule

A — Surface mounted LED ceiling fixture NUVO model 62-1191 White, 26 W, 2000 Lumen, 3000K bulb included

A1 — Surface mounted LED ceiling fixture NUVO model 62-1265 White, 21.5 W, 1200 Lumen, 3000K bulb included

B — Vanity LED fixture, Progress model 300243-009-30, brushed nickle, 22.7 W, 30000k, 90 CRI, 1,798 lumen bulb included. Mount 7'-0" AFF.

C — Wall fixture, Barn Light Electric model 16", Warehouse Gooseneck Light, Provide model G22 gooseneck, 26 W., 3000k, 85CRI bulb. Colors to be determined by architect.

D — Not Used

E — Not Used

F — LED bi-level fixture 1' x 4', suspension mount; Metalux model 4WSLA-125-SP-S-UNV-L935-CD1-SVPS2-AC48, With integral bi-level ultrasonic sensor SVPD2. Provide programming tool ISHH-01. Provide SCF-12" pendent kit.

G — LED bi-level illumination fixture 1' x 4', surface mount; Lamar model VOL48AFA40AS, With integral ultrasonic sensor.

H — Protected utility fixture, Lumark model VWF26HFLEB120, 120 V, 17.7 W, 1,450 Lumens, 3,500 K LED.

J — LED utility flood light fixture ceiling box mount; Cooper model VFS-K-B40-7-LED-E1-WST-WH, 120 V, 48 W, 6,000 Lumens, 4,000 K LED. Provide occupancy sensors as shown on plans.

K — Ceiling mount high bay warehouse bi-level light fixture, Metalux model UHBS-1218-MV-L84050 100 W, 13400 lumens, 4000 K, 82 CRI, dimming 10-100%. Provide mounting bracket, ALR13 reflector, bi-level IR sensor PK (50' range) and Sensor remote programmer for project.

L — Switched outdoor rated flood light and GFI receptacle, Provide 20 W. outdoor LED flood light bulbs.

Illuminated exit light McPhilben model CXL3RW, feed from emergency lighting circuit.

Lighting Notes

Note: All fixtures are to be energy star compliant.
Site Lights: See Site Lighting plan for further details.
Provide Programing of all lighting controls per requirements of Tenant/Owner.
Lighting Programing tool is the property of the Owner.
Provide programing instructions to Owner/Representative.

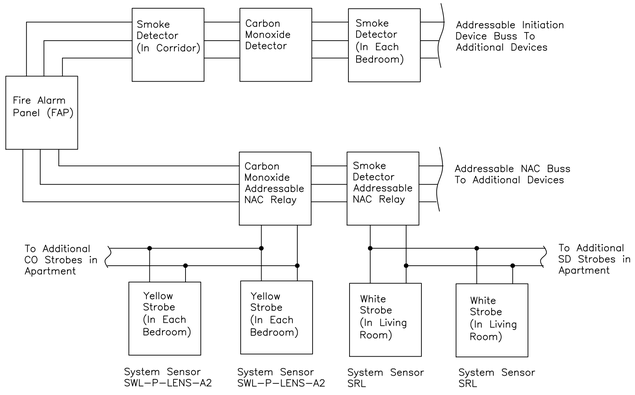
Dimming And Daylight Harvesting Schedule

Fixture Type	Location	Occupied Level (%)	Unoccupied Level (%)	Unoccupied Delay (Min)	Daylight Sensor (Lux)	Notes
F	Corridors	100	25	5	na	
F	Community	100	0	5	na	
F	Day Room	100	0	5	na	
F	Mechanical	100	100	na	na	Switched
F	Storage	100	0	5	na	
F	Office	100	0	20	na	
F	Electric Rms	100	100	na	na	Switched
F	Bathroom	50	0	5	na	
G	Stairs	100	25	5	na	
K	Atrium	100	30	30	30	

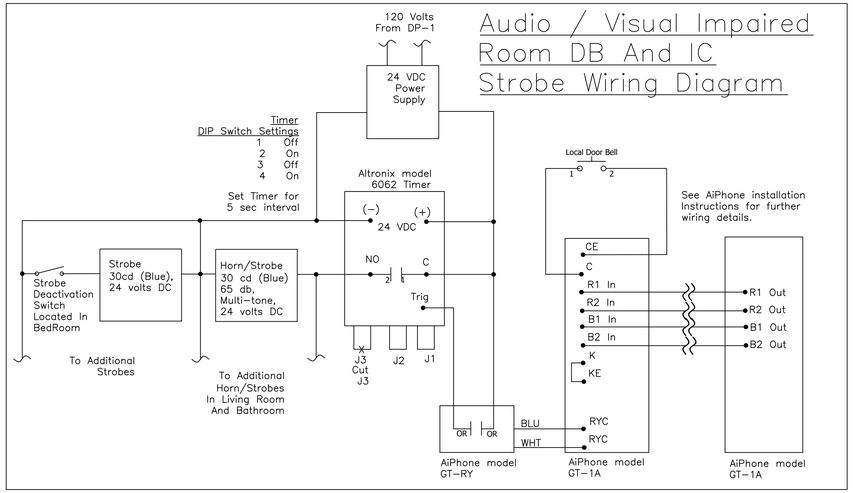
Electric Legend

- (CO) Carbon monoxide detector, hard wired
- (SD) Smoke detector, hard wired
- (HD) Heat detector, hard wired
- PS — Pull station, mount 48" AFF
- MR — Magnetic door release
- AV — Fire Alarm audio visual annunciator
- FAP — Fire alarm panel
- FAA — Fire alarm annunciator
- AORIC — Area of refuge intercom, see electric notes for details.
- IAP — Internet access point (WiFi transciever), coordinate with owner.
- DB — Door bell, include power supply and chime above door
- IC — Intercom, see electric notes for details.
- EC — Entry control, see electric notes for details.
- JB — Junction box
- CT — Current transformer box
- DISC — Disconnect
- OS — Occupancy Sensor, combination ultrasonic and passive infrared.
- D — Dimmer, 0-10 Volt control and switch.
- $ — single pole light switch
- $3 — 3 way light switch
- $D — Dimmer, low voltage, 0-10 volts
- $T — Timer, 20 minutes
- Duplex receptacle
- GFI — Ground fault receptacle
- FR — Floor receptacle
- ◀ — 208 volt receptacle, amps as marked
- TV — Cable TV
- Data connection
- Telephone
- (T) — Thermostat

Audio / Visual Impaired Room SD And CO Strobe Wiring Diagram



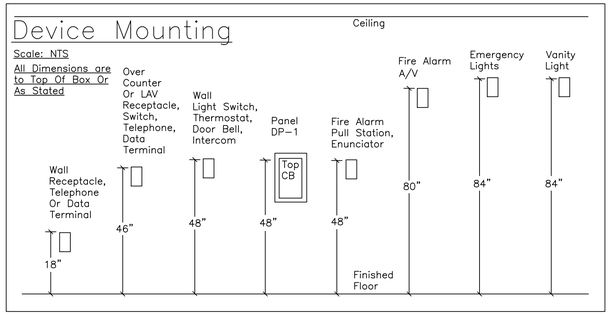
Audio / Visual Impaired Room DB And IC Strobe Wiring Diagram



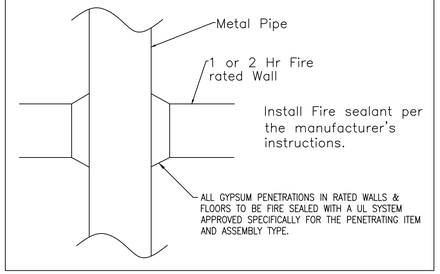
Device Mounting

Scale: NTS

All Dimensions are to Top Of Box Or As Stated

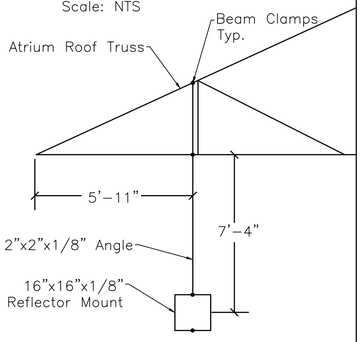


Fire Caulking Metal Pipes



Beam Smoke Detector Reflector Mounting Detail

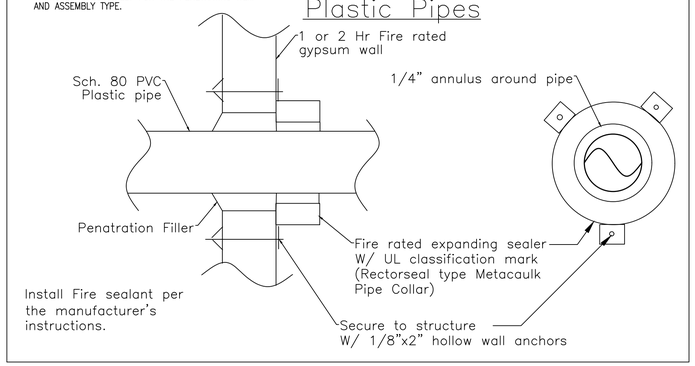
Scale: NTS



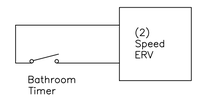
Confirm dimensions with actual mounting of Beam Smoke Detectors

Fire Caulking Plastic Pipes

ALL GYPSUM PENETRATIONS IN RATED WALLS & FLOORS TO BE FIRE SEALED WITH A UL SYSTEM APPROVED SPECIFICALLY FOR THE PENETRATING ITEM AND ASSEMBLY TYPE.



2 Speed ERV Wiring Diagram



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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

Electric Light Fixture Schedule And Details

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-7

PANEL: DP-1 Apts A1, A2, C, E | LOCATION: Dwelling Unit
RATING: 125 Amp Main Lug Only | VOLTAGE: 120/208 1 PHZ 3 Wire
BUS: 125 AMP, Aluminum | POSITIONS: 24
MOUNTING: Flush | INT. RATING: 10 KAIC
NEMA Enclosure 1 | Bolted Fault Current 10 KA

Wire Size	Conduit Size	POS	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	POS	Wire Size	Conduit Size
8	NMB *	1	Cond-1, 2, 4, 6 HACR	25	2	A	20	1	Range Hood AFCI	2	12	NMB *
		3	↓			B	20	1	Kitchen Receptacle AFCI	4	12	NMB *
6	NMB *	5	Range	50	2	A	20	1	Kitchen Receptacle AFCI	6	12	NMB *
		7	↓			B	20	1	Bathroom Receptacle AFCI	8	12	NMB *
12	NMB *	9	ASHP-7 only HACR	15	2	A	20	1	Receptacles AFCI	10	12	NMB *
		11	↓			B	20	1	Receptacles AFCI	12	12	NMB *
		13				A	20	1	Receptacles AFCI	14	12	NMB *
		15				B	20	1	Lights AFCI	16	12	NMB *
		17				A	20	1	Lights AFCI	18	12	NMB *
		19				B				20		
		21				A				22		
		23				B				24		

* EMT Where exposed

PANEL: DP-2 Apts B, D | LOCATION: Dwelling Unit
RATING: 125 Amp Main Lug Only | VOLTAGE: 120/208 1 PHZ 3 Wire
BUS: 125 AMP, Aluminum | POSITIONS: 24
MOUNTING: Flush | INT. RATING: 10 KAIC
NEMA Enclosure 1 | Bolted Fault Current 10 KA

Wire Size	Conduit Size	POS	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	POS	Wire Size	Conduit Size
6	NMB *	1	Cond-3, 5 HACR	40	2	A	20	1	Range Hood AFCI	2	12	NMB *
		3	↓			B	20	1	Kitchen Receptacle AFCI	4	12	NMB *
6	NMB *	5	Range	50	2	A	20	1	Kitchen Receptacle AFCI	6	12	NMB *
		7	↓			B	20	1	Bathroom Receptacle AFCI	8	12	NMB *
		9				A	20	1	Receptacles AFCI	10	12	NMB *
		11				B	20	1	Receptacles AFCI	12	12	NMB *
		13	NMB *			A	20	1	Receptacles AFCI	14	12	NMB *
		15				B	20	1	Lights AFCI	16	12	NMB *
		17				A	20	1	Lights AFCI	18	12	NMB *
		19				B				20		
		21				A				22		
		23				B				24		

* EMT Where exposed

PANEL: DP-3 Apt F only | LOCATION: Dwelling Unit
RATING: 125 Amp Main Lug Only | VOLTAGE: 120/208 1 PHZ 3 Wire
BUS: 125 AMP, Aluminum | POSITIONS: 24
MOUNTING: Flush | INT. RATING: 10 KAIC
NEMA Enclosure 1 | Bolted Fault Current 10 KA

Wire Size	Conduit Size	POS	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	POS	Wire Size	Conduit Size
8	NMB *	1	Cond-7 HACR	25	2	A	20	1	Range Hood AFCI	2	12	NMB *
		3	↓			B	20	1	Kitchen Receptacle AFCI	4	12	NMB *
6	NMB *	5	Range	50	2	A	20	1	Kitchen Receptacle AFCI	6	12	NMB *
		7	↓			B	20	1	Bathroom Receptacle AFCI	8	12	NMB *
12	NMB *	9	ASHP-7 HACR	15	2	A	20	1	Receptacles AFCI	10	12	NMB *
		11	↓			B	20	1	Receptacles AFCI	12	12	NMB *
		13				A	20	1	Receptacles AFCI	14	12	NMB *
		15				B	20	1	Lights AFCI	16	12	NMB *
		17				A	20	1	Lights AFCI	18	12	NMB *
		19				B				20		
		21				A				22		
		23				B				24		

* EMT Where exposed

PANEL: MDP | LOCATION: Utility
RATING: 2,000 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 2,000 AMP, COPPER | POSITIONS: 30
MOUNTING: Surface | INT. RATING: 65 KAIC
NEMA Enclosure 1 | Bolted Fault Current 59 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
600	4	1	PP-1	400	3	A	500	3	PP-5	2	(2) 600	4
		3	↓			B			↓	4		
		5	↓			C			↓	6		
350	3	7	PP-2	300	3	A	100	3	PP-6	8	3	1-1/4
		9	↓			B			↓	10		
		11	↓			C			↓	12		
(2) 250	3	13	PP-3	500	3	A	150	3	EP-1	14	1/0	2
		15	↓			B			↓	16		
		17	↓			C			↓	18		
600	4	19	PP-4	400	3	A	100	3	EP-2	20	1/0	2
		21	↓			B			↓	22		
		23	↓			C			↓	24		
		25				A				26		
		27				B				28		
		29				C				30		

PANEL: PP-1 | LOCATION: Utility
RATING: 400 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 400 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 55 KAIC
NEMA Enclosure 1 | Bolted Fault Current 51 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
4	1-1/4	1	DHW HP1 HACR	70	3	A	30	3	P-3 HACR	2	10	3/4
		3	↓			B			↓	4		
		5	↓			C			↓	6		
4	1-1/4	7	DHW HP1 HACR	70	3	A	20	2	P-4 HACR	8	12	MC *
		9	↓			B			↓	10		
		11	↓			C	20	2	P-4 HACR	12	12	MC *
8	1	13	DHW HP2 HACR	35	2	A			↓	14		
		15	↓			B	15	1	P-5 HACR	16	12	MC *
8	1	17	DHW HP2 HACR	35	2	C	15	1	P-5 HACR	18	12	MC *
		19	↓			A	20	1	AFT HACR	20	12	MC *
10	3/4	21	P-2 HACR	30	3	B	20	1	EH1	22	12	MC *
		23	↓			C	15	1	Controls	24	12	MC *
		25	↓			A	20	1	Receptacles Utility Rm	26	12	MC *
10	3/4	27	P-2 HACR	30	3	B	20	1	Receptacles Utility Rm	28	12	MC
		29	↓			C	50	2	EV Charger	30	6	1
		31	↓			A			↓	32		
10	3/4	33	P-3 HACR	30	3	B	50	2	EV Charger	34	6	1
		35	↓			C			↓	36		
		37	↓			A	20	1	Spare	38		
12	MC *	39	GSHP2 HACR	15	2	B	20	1	Spare	40		
		41	↓			C				42		

* EMT Where exposed

PANEL: PP-2 | LOCATION: Utility
RATING: 400 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 400 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 38 KAIC
NEMA Enclosure 1 | Bolted Fault Current 35 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
12	MC *	1	GSHP-1 HACR	15	2	A	60	3	Elevator South Shunt Trip	2	4	1-1/4
		3	↓			B			↓	4		
6	MC *	5	GSHP-3 HACR	50	2	C			↓	6		
		7	↓			A			Shunt Trip	8		
6	MC *	9	GSHP-4 HACR	50	2	B	20	1	Elevator Car	10	12	MC *
		11	↓			C	15	3	ERV3 HACR	12		MC *
3	MC *	13	GSHP-5 HACR	50	2	A			↓	14		
		15	↓			B			↓	16		
8	MC *	17	GSHP-7 HACR	40	2	C	20	3	ERV6 HACR	18	12	MC *
		19	↓			A			↓	20		
6	MC *	21	GSHP-11 HACR	50	2	B			↓	22		
		23	↓			C	20	1	Sump Pump South	24	12	MC *
12	MC *	25	GSHP-13 HACR	20	2	A	20	1	Radon Fan South	26	12	MC *
		27	↓			B	20	1	EH-1	28	12	NMB *
12	MC *	29	ERV1 HACR	15	3	C	20	1	EH-1	30	12	NMB *
		31	↓			A	20	1	EH-1	32	12	NMB *
		33	↓			B	20	1	EH-1	34	12	NMB *
12	MC *	35	ERV2 HACR	15	3	C	20	1	EH-1	36	12	NMB *
		37	↓			A	20	1	EF-3 (2)	38	12	NMB *
		39	↓			B	20	1	Spare	40		
		41				C				42		

* EMT Where exposed

PANEL: PP-3 | LOCATION: 3rd Floor South Mech Rm
RATING: 600 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 600 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 32 KAIC
NEMA Enclosure 1 | Bolted Fault Current 30 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
**	**	1	RT-1 HVAC	60	3	A	20	1	Receptacles General	2	12	NMB *
		3	↓			B	20	1	Receptacles General	4	12	NMB *
		5	↓			C	20	1	Receptacles General	6	12	NMB *
**	**	7	RT-1 HVAC	60	3	A	20	1	Receptacles General	8	12	NMB *
		9	↓			B	20	1	Receptacles General	10	12	NMB *
		11	↓			C			↓	12		
**	**	13	RT-1 HVAC	60	3	A			↓	14		
		15	↓			B			↓	16		
		17	↓			C			↓	18		
**	**	19	RT-1 HVAC	60	3	A			↓	20		
		21	↓			B			↓	22		
		23	↓			C			↓	24		
**	**	25	RT-1 HVAC	60	3	A			↓	26		
		27	↓			B			↓	28		
		29	↓			C			↓	30		
**	**	31	RT-1 HVAC	60	3	A			↓	32		
		33	↓			B			↓	34		
		35	↓			C			↓	36		
**	**	37	RT-1 HVAC	60	3	A			↓	38		
		39	↓			B			↓	40		
		41	↓			C			↓	42		

* EMT Where exposed
** <150' #4, 1-1/4" C.
** <230' #2, 1-1/4" C.
** <300' 1/0, 2" C.

PANEL: PP-4 | LOCATION: 2nd Floor North Mech Rm
RATING: 400 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 400 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 15 KAIC
NEMA Enclosure 1 | Bolted Fault Current 12 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
8	NMB *	1	Dryer	30	2	A	60	3	Elevator North Shunt Trip	2	2	1-1/2
		3	↓			B			↓	4		
8	NMB *	5	Dryer	30	2	C			↓	6		
		7	↓			A			Shunt Trip	8		
8	NMB *	9	Dryer	30	2	B	20	1	Elevator Car	10	12	MC *
		11	↓			C	15	2	GSHP9 HACR	12	12	MC *
8	NMB *	13	Dryer	30	2	A			↓	14		
		15	↓			B	15	2	GSHP9 HACR	16	12	MC *
8	NMB *	17	Dryer	30	2	C			↓	18		
		19	↓			A	40	2	GSHP10 HACR	20	8	MC *
8	NMB *	21	Dryer	30	2	B			↓	22		
		23	↓			C	40	2	GSHP12 HACR	24	8	MC *
10	NMB *	25	Washer	20	1	A			↓	26		
10	NMB *	27	Washer	20	1	B	15	2	ERV4 HACR	28	12	MC *
10	NMB *	29	Washer	20	1	C			↓	30		
10	NMB *	31	Washer	20	1	A			↓	32		
10	NMB *	33	Washer	20	1	B	15	2	ERV5 HACR	34	12	MC *
10	NMB *	35	Washer	20	1	C			↓	36		
4	MC *	37	GSHP8 HACR	40	2	A			↓	38		
		39	↓			B	15	1	EF3 (2)	40	12	MC *
12	NMB *	41	Receptacles General	20	1	C	20	1	Sump Pump North	42	12	MC *

* EMT Where exposed

PANEL: PP-5 | LOCATION: 3rd Floor North Mech Rm
RATING: 600 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 600 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 25 KAIC
NEMA Enclosure 1 | Bolted Fault Current 21 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
**	**	1	RT-1 HVAC	60	3	A	20	1	Receptacles General	2	12	NMB *
		3	↓			B	20	1	Receptacles General	4	12	NMB *
		5	↓			C	20	1	Receptacles General	6	12	NMB *
**	**	7	RT-1 HVAC	60	3	A	20	1	Receptacles General	8	12	NMB *
		9	↓			B	20	1	Receptacles General	10	12	NMB *
		11	↓			C	20	1	Receptacles General	12	12	NMB *
**	**	13	RT-1 HVAC	60	3	A	20	1	Receptacles General	14	12	NMB *
		15	↓			B	20	1	Fire Alarm Power Supply	16	12	NMB *
		17	↓			C	20	1	Fire Alarm Power Supply	18	12	NMB *
**	**	19	RT-1 HVAC	60	3	A	20	1	Fire Alarm Power Supply	20	12	NMB *
		21	↓			B	20	1	Spare	22		
		23	↓			C			↓	24		
**	**	25	RT-1 HVAC	60	3	A			↓	26		
		27	↓			B			↓	28		
		29	↓			C			↓	30		
**	**	31	RT-1 HVAC	60	3	A			↓	32		
		33	↓			B			↓	34		
		35	↓			C			↓	36		
**	**	37	RT-1 HVAC	60	3	A			↓	38		
		39	↓			B			↓	40		
		41	↓			C			↓	42		

* EMT Where exposed
** <170' #1, 2" C.
** <220' 1/0, 2" C.
** <260' 2/0, 2" C.

PANEL: PP-6 | LOCATION: Utility
RATING: 100 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 100 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 22 KAIC
NEMA Enclosure 1 | Bolted Fault Current 20 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
12	MC *	1	Fire Alarm Panel	15	1	A	15	1	Telco	2	12	MC *
12	MC *	3	Fire Alarm Power Supply	15	1	B	15	1	CTV	4	12	MC *
12	MC *	5	Fire Alarm Power Supply	15	1	C	20	1	Receptacles General	6	12	MC *
12	MC *	7	Fire Alarm Power Supply	15	1	A	20	1	Receptacles General	8	12	MC *
2	MC *	9	GSHP-14 East	60	2	B	20	1	Receptacles General	10	12	MC *
		11	↓			C	20	1	Receptacles General	12	12	MC *
4	MC *	13	GSHP-14 West	60	2	A	20	1	Receptacles General	14	12	MC *
		15	↓			B	20	1	Spare	16		
		17				C	20	1	Spare	18		
		19				A				20		
		21				B				22		
		23				C				24		
		25				A				26		
		27				B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL: EP-1 | LOCATION: Electric Room
RATING: 150 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 150 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 23 KAIC
NEMA Enclosure 1 | Bolted Fault Current 21 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
12	NMB *	1	1st Floor Lights south	20	1	A	20	1	Management Receptacles	2	12	NMB *
12	NMB *	3	2nd Floor Lights south	20	1	B	20	1	Bathroom receptacle	4	12	NMB *
12	NMB *	5	2nd Floor Corridor Lights south	20	1	C	20	1	Copier receptacle	6	12	NMB *
12	NMB *	7	2nd Floor Corridor Lights south	20	1	A	20	1	Management Lights	8	12	NMB *
12	NMB *	9	3rd Floor Corridor Lights south	20	1	B	20	1	Spare	10		
12	NMB *	11	3rd Floor Corridor Lights south	20	1	C				12		
12	NMB *	13	Stairs S	20	1	A				14		
12	NMB *	15	Stairs S	20	1	B				16		
10	1/2	17	Atrium Lights South	20	1	C				18		
10	1/2	19	Atrium Lights South	20	1	A				20		
12	NMB *	21	General Lights	20	1	B				22		
12	NMB *	23	Generator Controls	20	1	C				24		
12	NMB *	25	Generator heater	20	1	A				26		
12	NMB *	27	Night Circuit	20	1	B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
1	1-1/2	37	EP-3	100	3	A				38		
		39	↓			B				40		
		41	↓			C				42		

* EMT Where exposed

PANEL: EP-2 | LOCATION: Smoke Contol Rm
RATING: 100 Main Lug Only | VOLTAGE: 120/208 3 PHZ 4 WIRE
BUS: 100 AMP, COPPER | POSITIONS: 42
MOUNTING: Surface | INT. RATING: 20 KAIC
NEMA Enclosure 1 | Bolted Fault Current 17 KA

Wire Size	Conduit Size	CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
**	MC *	1	SC-1 HACR	20	2	A	20	2	SC-1 HACR	2	**	MC *
		3	↓			B			↓	4		
**	MC *	5	SC-1 HACR	20	2	C	20	2	SC-1 HACR	6	**	MC *
		7	↓			A			↓	8		
**	MC *	9	SC-1 HACR	20	2	B	20	2	SC-1 HACR	10	**	MC *
		11	↓			C			↓	12		
**	MC *	13	SC-1 HACR	20	2	A	20	2	SC-1 HACR	14	**	MC *
		15	↓			B			↓	16		
**	MC *	17	SC-1 HACR	20	2	C	20	2	SC-1 HACR	18	**	MC *
		19	↓			A			↓	20		
**	MC *	21	SC-1 HACR	20	2	B	20	2	SC-1 HACR	22	**	MC *
		23	↓			C			↓	24		
**	MC *	25	SC-1 HACR	20	2	A	20	2	SC-1 HACR	26	**	MC *
		27	↓			B			↓	28		
12	MC *	29	Controls	20	1	C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* UL 2196, 2 Hr rated, EMT Where exposed
** <200' #12
** <270' #10
** <420' #8

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

Electric Panel Schedules

REVISIONS
1/26/24
3/11/24

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-8

PANEL:	EP-3			LOCATION:	2nd Floor North Mech Rm		
RATING:	100 Main Lug Only			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	100 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	10 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
12	NMB *	1	1st Floor Lights north	20	1	A	20	1	Community Rm Receptacles	2	12	MC *
12	NMB *	3	1st Floor Lights north	20	1	B	20	1	Community Rm Receptacles	4	12	MC *
12	NMB *	5	2nd Floor Corridor Lights north	20	1	C	20	1	Community Rm Receptacles	6	12	MC *
12	NMB *	7	2nd Floor Corridor Lights north	20	1	A	20	1	Kitchenette Receptacles	8	12	MC *
12	NMB *	9	3rd Floor Corridor Lights north	20	1	B	20	1	Kitchenette Receptacles	10	12	MC *
12	NMB *	11	3rd Floor Corridor Lights north	20	1	C	20	1	Bathroom receptacle	12	12	MC *
12	NMB *	13	Stairs N	20	1	A	20	1	Community Rm lights	14	10	MC *
12	NMB *	15	Stairs N	20	1	B	20	1	Spare	16		
8	3/4	17	Atrium Lights North	20	1	C				18		
8	3/4	19	Atrium Lights North	20	1	A				20		
12	NMB *	21	General Lights	20	1	B				22		
12	NMB *	23	Night Circuit	20	1	C				24		
		25				A				26		
		27				B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL:	CM-2			LOCATION:	Electric Room		
RATING:	125 Main Circuit Breaker			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	125 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	10 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
4	MC *	1	COND-10 HACR	40	2	A	20	1	Receptacles GFI	2	12	MC *
		3	↓			B	20	1	Receptacles GFI	4	12	MC *
12	MC *	5	ASHP-10 HACR	15	2	C	20	1	Lights	6	12	MC *
		7	↓			A	20	1	Lights	8	12	MC *
12	MC *	9	ERV9 HACR	15	2	B				10		
		11	↓			C				12		
		13				A				14		
		15				B				16		
		17				C				18		
		19				A				20		
		21				B				22		
		23				C				24		
		25				A				26		
		27				B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL:	KP-1			LOCATION:	Electric Room		
RATING:	800 Main LUG			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	800 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	35 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
8	MC *	1	COND-8 HACR	40	2	A	20	1	Receptacles GFI	2	12	MC *
		3	↓			B	20	1	Receptacles GFI	4	12	MC *
8	MC *	5	COND-8 HACR	40	2	C	20	1	Lights	6	12	MC *
		7	↓			A	20	1	Lights	8	12	MC *
8	MC *	9	COND-8 HACR	40	2	B				10		
		11	↓			C				12		
12	MC *	13	ASHP-8 HACR	15	2	A				14		
		15	↓			B				16		
12	MC *	17	ASHP-8 HACR	15	2	C				18		
		19	↓			A				20		
12	MC *	21	ASHP-8 HACR	15	2	B				22		
		23	↓			C				24		
12	MC *	25	ERV7 HACR	15	3	A				26		
		27	↓			B				28		
		29	↓			C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL:	FM-1			LOCATION:	Electric Room		
RATING:	200 Main Circuit Breaker			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	200 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	10 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
4	MC *	1	COND-11 HACR	30	2	A	20	1	Receptacles GFI	2	12	MC *
		3	↓			B	20	1	Receptacles GFI	4	12	MC *
12	MC *	5	ASHP-11 HACR	15	2	C	20	1	Lights	6	12	MC *
		7	↓			A	20	1	Lights	8	12	MC *
4	MC *	9	COND-11 HACR	30	2	B	20	1	Lights	10	12	MC *
		11	↓			C				12		
12	MC *	13	ASHP-11 HACR	15	2	A				14		
		15	↓			B				16		
12	MC *	17	ERV10 HACR	15	2	C				18		
		19	↓			A				20		
		21				B				22		
		23				C				24		
		25				A				26		
		27				B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL:	KP-2			LOCATION:	Electric Room		
RATING:	800 Main Lug			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	800 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	30 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
6	MC *	1	COND-8 HACR	40	2	A	20	1	Receptacles GFI	2	12	MC *
		3	↓			B	20	1	Receptacles GFI	4	12	MC *
6	MC *	5	COND-8 HACR	40	2	C	20	1	Lights	6	12	MC *
		7	↓			A	20	1	Lights	8	12	MC *
6	MC *	9	COND-8 HACR	40	2	B				10		
		11	↓			C				12		
12	MC *	13	ASHP-8 HACR	15	2	A				14		
		15	↓			B				16		
12	MC *	17	ASHP-8 HACR	15	2	C				18		
		19	↓			A				20		
12	MC *	21	ASHP-8 HACR	15	2	B				22		
		23	↓			C				24		
12	MC *	25	ERV7 HACR	15	3	A				26		
		27	↓			B				28		
		29	↓			C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

PANEL:	CM-1			LOCATION:	Electric Room		
RATING:	200 Main Circuit Breaker			VOLTAGE: 120/208	3 PHZ 4 WIRE		
BUS:	200 AMP, COPPER			POSITIONS:	42		
MOUNTING:	Surface			INT. RATING:	10 KAIC		

Wire Size	Conduit Size	NEMA Enclosure 1 CIR.	DESCRIPTION	AMPS	POLES		AMPS	POLES	DESCRIPTION	CIR.	Wire Size	Conduit Size
6	MC *	1	COND-9 HACR	40	2	A	20	1	Receptacles GFI	2	12	MC *
		3	↓			B	20	1	Receptacles GFI	4	12	MC *
12	MC *	5	ASHP-9 HACR	15	2	C	20	1	Lights	6	12	MC *
		7	↓			A	20	1	Lights	8	12	MC *
6	MC *	9	COND-9 HACR	40	2	B				10		
		11	↓			C				12		
12	MC *	13	ASHP-9 HACR	15	2	A				14		
		15	↓			B				16		
12	MC *	17	ERV8 HACR	15	2	C				18		
		19	↓			A				20		
		21				B				22		
		23				C				24		
		25				A				26		
		27				B				28		
		29				C				30		
		31				A				32		
		33				B				34		
		35				C				36		
		37				A				38		
		39				B				40		
		41				C				42		

* EMT Where exposed

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° PROPOSED MULTIFAMILY DWELLING FOR °

Harrison Place Lofts

210 Walnut Street, Lockport, NY

Electric Panel Schedules

REVISIONS

1/26/24	
3/11/24	

DATE
10/20/23

PROJECT NUMBER
19-13

SHEET NUMBER
E-9

General Electric Notes:

1.) a. Install all equipment per the manufacturer's installation instructions.
All installation and service to be by manufacturer trained personel.
b. All wiring to be per 2017 NEC.
c. All electric panels are to be fully rated.
d. All receptacles in dwellings are to be tamper resistant per NEC art. 406.11.
e.
All branch circuit wiring to be as designated in panel schedules as requiring conduit to be type THWN or as marked.
g. Wiring exposed on ceilings and walls to be in conduit and secured to ceiling.
h. All cables and conduits are to have ground wires of equal size to phase wires.
i. All conductor sizes are based on copper conductors.
j. Branch circuit wiring conductors to be 12 gauge minimum
k. Receptacles in opposite sides of fire rated walls are to be separated a minimum of 24" horizontally.
l. Label panels with fault current and personal protective gear rating labels.
m. Receptacles and switches are to be air sealed with foam pads behind cover plates.
n. All wiring in the community room walls and ceiling is type MC or in conduit where exposed.

2.) a. Supply and install a temporary site electric service per the local electric utility as required for the project contractors.
Remove all temporary power equipment upon completion of the electric distribution system.
b. Supply and install a new electric service per the electric riser diagram and electric panel schedules.
c. All service entrance equipment is to be coordinated, supplied and installed per the requirements of the local utility.
d. Coordinate the utility transformer pad locations and requirements with the local utility.
e. Installation to be per National Grid ESB-750 and ESB-759B specification for electrical installations.
f. Field confirm all equipment power requirements. Report differences to the engineer.
g. Provde house CT cabinets per the requirements of the local utility.
h. Smoke control feeder, branch and control wiring to be UL-2196, 2 Hr rated.

3.) a. All power and control wiring for the, plumbing and HVAC systems are by the electric contractor.
b. All starters are supplied by other contractors, the electrical contractor is to mount and wire same.
c. All disconnect switches are provided by the electrical contractor for all mechanical equipment needing such.
d. Review drawings of other trades for power and control wiring requirements and coordinate electric work with all contractors.
e. Label all panels, disconnect switches and starters.
f. Provide grounding jumpers of size equal to main system ground across hot water heater, water meter, back flow preventer pressure regulator.
g. Provide grounding of flexible gas pipe per NYS code as required.
h. All Gypsum board penatrations in rated walls & floors to be fire sealed with UL system approved specifically for the penatrating item and assembly type. Not applicable to fire rated electrical boxes.

4.) a. Supply and install an addressable fire alarm system as shown on plans, as manufactured by Honeywell.
b.
All associated equipment including but not limited to pull stations, smoke detectors, sounder bases, duct detectors, heat detectors, carbon monoxide detectors, magnetic door releases, audio visual annunciators, central annunciator and all related wiring and interlock circuitry are to be compatible with the central fire alarm panel.
c. Provde sounder bases on all dwelling smoke detectors.
d. NAC and power circuit to feed sounder bases, CO detectors and strobes.
e. Provide isolator control points for every (25) addressable devices along signal cable.
f. Include initiation devices for tamper and alarm for main and floor control valves and flow switches of the sprinkler
g. Include trouble initiation from the emergency generator annunciator panel circuit.
h. Provde trouble initiation from elevator AORIC call box relays and base station power supply.
i. Provide outdoor alarm horn strobe near fire department connection per sprinkler contractor.
j. Provde fire alarm shut down signal and feeds to mechanical equipment per NFPA 72.
k. Provide smoke control activation signal to SC-1 starter relay.
l. Provide beam dectrors and reflectors in atrium per plans and details.
m. Products and installation are to be per NFPA 72 fire alarm code and NYS fire code.
n. Unlock Entry doors upon fire alarm, provide relays as required.
o. Provide elevator car recall and shutdown upon fire alarm per NFPA 72 and NEC article 620.
p. Provide a UL approved radio device for the second form of communication to the monitoring call station.
q. Smoke Detector Operation:
1. Initiation device in the common, office or storage spaces to notify of an alarm in all spaces and dwellings.
2. Initiation of an alarm in any dwelling area is to notify in that dwelling only through sounder bases.
3. In Audio/Visual Impaired rooms, the fire alarm notification will include additional visual red strobes as shown in the dwelling detail plans.
4. Trouble indication to be sent to the call monitoring station.
r. Carbon Monoxide Detector Operation:
1. Provide CarbonMonoxide (CO) detectors as shown on plans.
2. Each CO detector is to have an inteligent sounder base operating off the NAC circuit.
3. Each CO detector is to be wired to the addreesable fire alarm system buss.
4. Upon a CO signal, the associated base is to alarm in 4 short beeps and the central panel to call out to the monitoring station.
5. The CO signal is not to activate the fire alarm.
6. Provide all required programming and hardware.
7. In Audio/Visual Impaired rooms, the (CO) alarm notification will include additional visual white strobes as shown in the dwelling detail plans.
8. (CO) Alarm initiationis to send a trouble indication to the call monitoring station.
s. Trouble signal for any device to be sent out to call monitoring station.

5.) a. Supply and install all builidng lighting as shown on plans.
b. Provide all required set up and programming of lighting controls per the lighting fixture and dimming schedule.
c. Supply and install site lighting as shown on the site plan.
d. Provde photocell and ASCO relay having (4) circuits and rated 20 amps, 22 KAIC for the sight light circuit.
e. North site lights and night circuit contactor is synchronized from South lighting contactor.
f. Code lighting certification process to be provided by an approved independent certification contractor and fianla approval by the engineer.

6.) a. Supply and install all cable TV (RG-6), telephone (CAT-6) and data (CAT-6) wiring as shown on plans back to the mechanical room and terminate at the designated service panels per the local telephone and cable TV service
b. Internet access point (IAP) provided by other, this contracto to wire same.
c. Supply and install conduits as directed by the respective utility.

7.) a. Field confirm loads of elevator, HVAC equipmentand pump motors. Report differences to the engineer.

8.) a. Elevator circuits and wiring to provided and installed per NFPA-70 (NEC) Article 620, coordinate with the elevator contractor and manufacturer requiremrts.

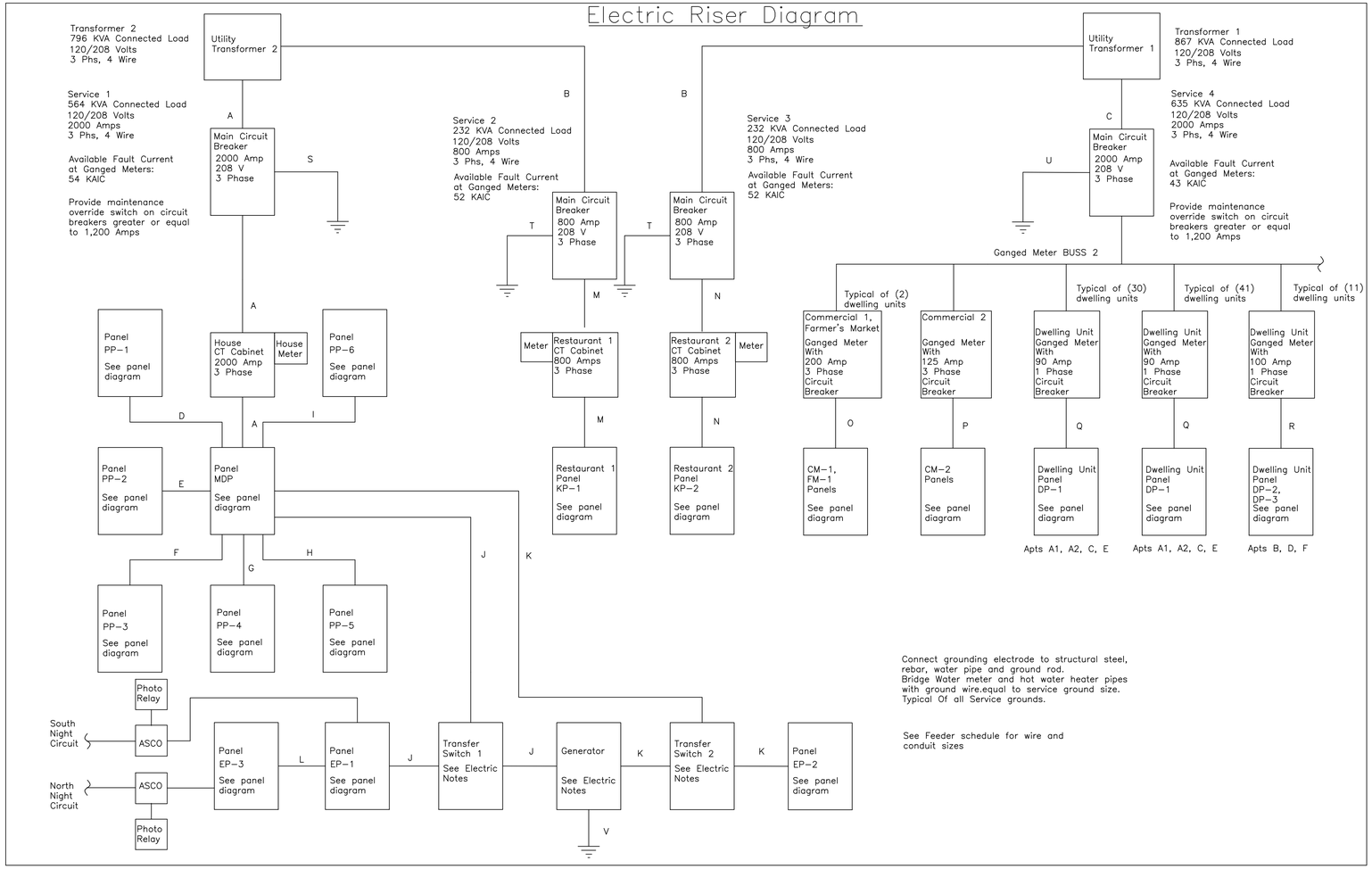
9.) a. Supply and install an intercom in each dwelling unit wired to the main console near the main lobby as located on
b. The intercom is to be of stainless steel construction, programable, multi line display, audio only and pushbutton operation with station quantity capability of the number of units and offices with, addressable name and number as manufactured by AiPhone model GT series or equal. Provide fire alarm door release relay.
c. The system is to be setup, programmed and wired to each dwelling tenant panel.
d. Provde additional expansion modules as required.
e. Provide a wall mounted audio only communications panel model GT-1A in each dwelling for intercom use.
f. Provide power supplies and distribution devices as required.
g. In Audio Impaired dwellings, provide a blue strobe and door bell notification as shown on dwelling detail plan and as shown in the schematic plans. Consult manufacturer installation and wiring diagrams.

10.) a. In audio/ visual adapted rooms, supply and install strobes for the apartment smoke, carbon-monoxide detectors, doorbell and intercom systems per the audio/ visual wiring diagrams and the typical apartment electric plan.
Door bell, Intercom Blue Strobe (combined)
Smoke Detector White Strobe
Carbon Monoxide Yellow Strobe

11.) a. Supply and install an "Area of Refuge Intercom" (AORIC) in the elevator lobbies as shown on plans. Each AOIC is to be wired to the base station in the vestibule as located on plans.
b. The intercom is to be of steel construction and push button analog operation with 10 station capability minimum. The AORIC station: model 2100-958NSR, power supply: model 2500-PWR24, wire: 2 pair, CI 22 AWG, shielded, 2 Hr
c. Base station to be powered from power supply, provde power to power supply unit.
d. Provide telephone communication to base station for 911 call out.
e. Provde fire alarm supervision circuits to base station power supply and remote call box relays.
f. Provde all required programing of base station and phone numbers.
g. Provde all required Rath models 7049SS, 7041E, 7087 signage for each level to GC for mounting at AORIC locations.

12.) a. Provde and install Entry control button panels and electric magnetic strikes as shown on plans
b. Provide power feeds to entry control points where shown on plans.

Electric Riser Diagram



Connect grounding electrode to structural steel, rebar, water pipe and ground rod. Bridge Water meter and hot water heater pipes with ground wire.equal to service ground size. Typical Of all Service grounds.

See Feeder schedule for wire and conduit sizes

13.) a. Provide power to fire alarm control point isolator as required by fire alarm contractor from local circuit.

14.) a. Provide GFI receptacles on roof adjacent to Radon Vent stack, coordinate with pluming contractor.

15.) a. Before any excavation, obtain a utility mark out, call 800-245-2828.

16.) a. Provide O&M books in digital format to owner's representative.
Provide operation and maintenance instruction to owner's reresentative.

17.) a. Supply and install a gas fired generator, transfer switch and associated wiring as shown on plans.
The generator is to provide emergency power to the following areas and systems of the building:
1. Management office receptacles and lighting.
2. All common area lighting circuits.
3. Community room circuits, except the HVAC unit.
4. Smoke control system SC-1 fans and dampers.
b. Generator: Generac model SG070, 928 cfh natural gas at 11"-14" H2O pressure, 70 KW, 120/208-3 phase, 4 wire
Engine to be water cooled, 4.5 L., V-8, 1800 RPM, turbocharged.
Alternator: 80 kw upsized 4 pole, alternator (K0080124Y21).
c. Provide: PZ control panel, (1) 150 Amp and (1) 100 Amp UL main circuit breakers, fuel flex line, pad vibration isolators, cables, group number 31 battery, fan and belt guard, engine run relay, 21 light annunciator panel, 85db horn, oil and coolant temperature pre-alarm, anti-freeze, generator emergency stop switch.
d. Painted aluminum sound attenuated (65.0 db @ 23', no load condition) outdoor whether enclosure.
e. Provide a stainless steel exhaust system composed of a SS critically tuned muffler, SS flexible connecting pipe, SS
f. Generator to be manufactured per UL 2200 specification standard and labeled as such.
g. All equipment to be per NFPA 110 level 1 requirements for emergency power operation.
h. Generator engine to meet the latest EPA emissions standards.
i. Provide GFI receptacle and switched light next to generator. Provide wiring and conduit for remote annunciator panel.
j. Install generator per installation instructions. Mount annunciator panel near transfer switch panel. Locate generator per site plan. Provide Manufacturer start up and report.
k. Any equipment substitution is to meet a maximum voltage drop of 10% per a computer generated loading
Run: 46.7 KW, 54.5 KVA
Start: 20.9 KW, 46.7 KVA
Harmonics: 22.0 KVA
l. (2) Automatic Transfer Switches:
Generac model TX010N-3G2LDNBY, 3 pole, 4 wire, 100 Amp., with standard exerciser in a NEMA-1 enclosure. Locate in Smoke Control room as shown on plans. Provide 2 year warranty.
Generac model TX020N-3G2LDNBY, 3 pole, 4 wire, 200 Amp., with standard exerciser in a NEMA-1 enclosure. Locate in south utility electric room as shown on plans. Provide 2 year warranty.
m. Transfer Switch to be manufactured per UL 1008 specification standard and labeled as such.
n. Provide: double set of auxiliary contacts and signal before transfer contacts. Coordinate work with elevator contractor requirements.
o. See generator specification for further details.

Feeder Schedule

FEEDER TAG	BUSS or PANEL/ CIR. #	# SETS	CONDUCTOR PHASE QTY./ SIZE	NEUTRAL SIZE	GROUND SIZE	MATERIAL	INSULATION TYPE	CONDUIT QTY./ SIZE	NOTES
A	Service 1 MDP	5	(3)-600 KCM	(1)-600 KCM	3/0	CU	THWN	4	
B	Service 2, 3, KP-1, 2	2	(3)-600 KCM	(1)-600 KCM	3/0	CU	THWN	4	
C	Service 4 Apts, CM-1, 2, FM	5	(3)-600 KCM	(1)-600 KCM	3/0	CU	THWN	4	
D	PP-1	1	(3)-600 KCM	(1)-600 KCM	2	CU	THWN	4	
E	PP-2	1	(3)-350 KCM	(1)-350 KCM	4	CU	THWN	3	
F	PP-3	2	(3)-250 KCM	(1)-250 KCM	1	CU	THWN	3	
G	PP-4	1	(3)-600 KCM	(1)-600 KCM	2	CU	THWN	4	
H	PP-5	2	(3)-600 KCM	(1)-600 KCM	2	CU	THWN	4	
I	PP-6	1	(3)-#3	(1)-#3	10	CU	THWN	1-1/4	
J	EP-1, Generator	1	(3)-1/0	(1)-1/0	6	CU	THWN	2	
K	EP-2, Generator	1	(3)-250KCM	(1)-250 KCM	4	CU	**2 Hr Rated**	1-1/4	**UL 2196, 2 Hr rated**
L	EP-3	1	(3)-250KCM	(1)-250 KCM	4	CU	THWN	1-1/2	
M	KP-1	2	(3)-350 KCM	(1)-350 KCM	1/0	CU	THWN	3	
N	KP-2	2	(3)-350 KCM	(1)-350 KCM	1/0	CU	THWN	3	
O	CM-1, FM-1	1	(3)-4/0	(1)-4/0	4	CU	THWN	2-1/2	
P	CM-2	1	(3)-#1	(1)-#1	6	CU	THWN	2	
Q	Dwelling DP-1	1	(2)-#2	(1)-#2	#2	AL	SER		Length<185'
Q	Dwelling DP-1	1	(2)-#1	(1)-#1	#1	AL	SER		Length<220'
Q	Dwelling DP-1	1	(2)-1/0	(1)-1/0	1/0	AL	SER		Length<270'
Q	Dwelling DP-1	1	(2)-2/0	(1)-2/0	2/0	AL	SER		Length<335'
Q	Dwelling DP-1	1	(2)-3/0	(1)-3/0	3/0	AL	SER		Length<420'
R	Dwelling DP-1	1	(2)-4/0	(1)-4/0	4/0	AL	SER		Length<450'
R	Dwelling DP-2	1	(2)-#1	(1)-#1	#1	AL	SER		Length<185'
R	Dwelling DP-2	1	(2)-1/0	(1)-1/0	1/0	AL	SER		Length<225'
R	Dwelling DP-2	1	(2)-2/0	(1)-2/0	2/0	AL	SER		Length<280'
R	Dwelling DP-2	1	(2)-3/0	(1)-3/0	3/0	AL	SER		Length<345'
R	Dwelling DP-2	1	(2)-4/0	(1)-4/0	4/0	AL	SER		Length<425'
S	GROUND	1			3/0	CU	THWN		
T	GROUND	1			2/0	CU	THWN		
U	GROUND	1			3/0	CU	THWN		
V	GROUND	1			#2	CU	THWN		

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Electric Riser Diagram, Feeder Schedule And Notes

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