KSingh | Engineers Scientists Consultants

April 18, 2023

Ms. Jennifer Meyer
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
1027 West St. Paul Avenue
Milwaukee, WI 53233

Project # 40441B

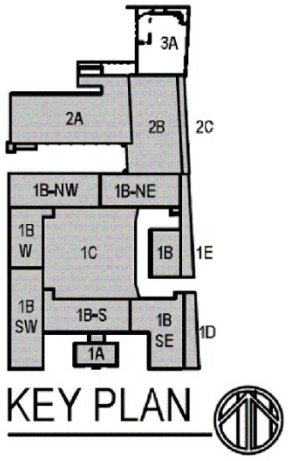
Subject: **Emergency Corrective Action Plan for Vapor Mitigation System**
Community Within the Corridor Limited Partnership – East Block
2748 N. 32nd Street, Milwaukee, WI 53210
BRRTS #: 02-41-263675, FID #: 241025400

Dear Ms. Meyer:

On behalf of the Community Within the Corridor Limited Partnership (CWC), K. Singh & Associates, Inc. (KSingh) is pleased to submit an Emergency Corrective Action Plan for the Community Within the Corridor – East Block project.

Project Background
The Community Within the Corridor Limited Partnership is redeveloping the property, a former Briggs and Stratton Factory, into a mix of affordable housing, commercial spaces, and other amenities. The property has been rezoned to Industrial Mix to facilitate development of the project. No demolition of the buildings was performed. The building interiors are renovated and reconfigured. A ramp was constructed to utilize the basement as a parking garage. Paved areas were restored with asphalt.

The East Block complex is a series of buildings and additions that have been identified by the key plan included below.



Building 1A is unoccupied and previously contained offices. Building 1B is the former boiler building for the facility. Buildings 1D and 1E are former dock areas for loading and unloading of materials from the railroad to the east. Building 3A is currently being used for unheated storage of materials. The remainder of the complex

is part of the redevelopment.

The property was previously investigated and granted Case Closure with continuing obligations as an industrial property under BRRTS # 02-41-263675. KSingh was retained to perform environmental consulting services for the redevelopment of the property. Following a Phase I Environmental Site Assessment, a Phase II Environmental Site Assessment, a Sub-Slab Vapor Sampling Memorandum, and a Post-Closure Modification Request was submitted to the WDNR on July 8, 2020. Following submission of the Post-Closure Modification Request, KSingh performed a Sub-Slab Vapor Investigation of the building. Trichloroethene (TCE) was identified as being under the buildings in the Site Investigation that was performed for the redevelopment.

The findings from the sub-slab vapor sampling activities are described as follows:

- Contamination related to chlorinated solvents consisting of TCE, Vinyl Chloride, 1,1,2- Trichloroethane, 1,1-Dichloroethane, 1,4-Dichlorobenzene, and/or Benzyl Chloride exceeds Residential VRSLs and/or Large Industrial / Commercial Building VRSLs below much of the East Block.
- TCE is the most widespread contaminant of concern under the building and is associated with past industrial uses of the facility.
- Petroleum VRSL exceedances are located in the northeast portion of the building, Building 3A, and are associated with the previously closed Leaking Underground Storage Tank case.

Based on the Sub-Slab Vapor Investigation, it was determined that a vapor mitigation system would be required for the facility in addition to the construction and maintenance of engineered barriers.

Based on the findings of the sub-slab vapor investigation and pressure field extension testing, as well as additional vapor and soil sampling, the following reports were submitted for review.

- Update to Post Closure Modification Request / Remedial Action Plan – March 19, 2021.
- Feasibility Study Proposed Modification of Vapor Mitigation / Extraction System – April 29, 2021.
- Feasibility Study and Design – Vapor Mitigation System – March 10, 2021.
- Additional Soils Investigation – March 24, 2021.
- Remedial Action Plan was approved on June 8, 2021. The plan elements were hot spot removal, installation of sub-slab depressurization piping, and construction of vapor barrier including concrete slab replacement.
- Technical Assistance Request – Modification of the Vapor Mitigation System – January 20, 2022.
- The system was constructed in accordance with the approved design and modifications as documented in the Interim Remedial Action Design Report dated April 6, 2023. Please refer to Figure 1 for the layout of the SSDS.
- A K09-MS 10-horsepower blower was provided by Fliteway Technologies for pilot scale testing for the Northern and Southern portions of the SSDS. A Pilot Scale report for the Northern Blower system was submitted to the WDNR on December 8, 2022. A Pilot Scale report for the Southern Blower system was submitted to the WDNR on January 28, 2023.
- A Commissioning Plan was submitted to WDNR on December 28, 2022 and updated on February 14, 2023. Commissioning was carried out in accordance with the February 14, 2023 plan.
- The results of Commissioning documented vapor intrusion of TCE into the building. The WDNR was provided test results and the City of Milwaukee issued an evacuation order on March 25, 2023. In addition, the WDNR issued an emergency order on March 31, 2023 requesting additional information.

A response to the Emergency Order, after an approved deadline extension, was submitted to the WDNR on April 7, 2023.

Results of Initial and Ongoing Corrective Actions

KSingh has been diligently testing and inspecting the East Block building since the evacuation order from the City of Milwaukee on March 25, 2023. Daily and weekly reports summarizing activities were provided to WDNR. The results to date indicate the following:

1. Insufficient vacuum is present under Buildings 1B-W and 1B-SW, allowing vapor concentrations to increase and find entry into the building. Adequate vacuum was observed in sub-slab vapor pins in buildings 3A, 2A, 2B, 1C, 1B-NE, 1B-NW, and 1B-SE.
2. Water appears to be present in the sub-slab depressurization system pipes on the west side of the complex under buildings 1B-SW and 1B-W. The water in the pipes is impairing the system's ability to draw vapors and induce vacuum.
3. Blowers had sufficient power to depressurize the building under dry conditions experienced during the pilot test but could not clear the pipes of water under wet conditions for both the northern and southern 10 HP blowers.
4. Water was observed entering the building above the sub-slab in buildings 1B-SE and 1B-SW after recent rain events.
5. Gaps in the interior are present particularly near degraded brick walls in units 1045 and 1050. A portion of the slab has been removed in room 1052 for water main entry. Gaps and unrepaired openings are limiting the system's ability to create vacuum and allowing TCE vapors to enter the building. The northern mechanical room 1150 had an unsealed crock, and a partially completed but unsealed vapor extraction point. The unsealed crock, with elevated PID readings, and the open vapor extraction point were entry ways for vapors into the Mechanical Room. These areas have been sealed.
6. A portable gas chromatograph (GC) is being used to monitor the presence of TCE since March 29, 2023. GC testing has provided real time data which is helpful in monitoring trends in the concentrations of TCE. Some improvements are documented but the levels of TCE continue to exceed Vapor Action Levels (VALs).

Principal Goals for Corrective Action

The following goals have been developed for emergency corrective action:

1. Remove water from the SSDS piping and prevent water from getting into the sub-slab in the future.
2. Restore depressurization beneath buildings 1B-SW and 1B-W and the northern mechanical room.
3. Identify and seal points of vapor intrusion throughout the facility.

The following corrective actions have been completed or are in progress:

1. REMOVAL OF WATER FROM SSDS SYSTEM

A. Installation of Sealed Sump Pits

As stormwater inflow is strongly suspected of impacting the SSDS system, a series of sump pits are proposed for the complex to prevent future buildup of water. Four sump pits are proposed located where sanitary and storm sewers exit the building to 32nd Street, presumably the low points of the piping runs. The proposed locations of the sump pits are shown in Figure 2. Each of the sump pits will be airtight to prevent vapor intrusion. Excavated soils for the sump pits will be

disposed of as contaminated soils. As the sumps may collect contaminated water, coordination with MMSD and WDNR will be required.

Water from the sumps will be containerized in drums, characterized, and properly disposed of. KSingh has an approved Notice of Intent from the Milwaukee Metropolitan Sewerage District (MMSD) for disposal of contaminated purge water from the monitoring wells on the site. As blower tote analysis results are consistent with the Notice of Intent approval, disposal to the combined sewer system in accordance with the requirements of the Notice of Intent is proposed. Additional testing will be performed periodically to confirm compliance. A pair of granular activated carbon (GAC) units will be mobilized if concentrations of VOCs are too great to be discharged to the sewer without treatment. Testing will be performed prior to treatment, between GAC units, and at the outlet of the GACs once per discharge event to document the waste stream, monitor the first GAC for breakthrough, and compliance with effluent limits. Alternatively, a vacuum truck or tanker will be utilized to transport the water to an appropriate disposal facility.

Excavated soils from the sump installations will be containerized in properly labeled 55-gallon drums and disposed of appropriately at a landfill.

B. Extract Water from Vapor Mitigation System by Entry into the Piping System
Removal of water from the SDDS pipes can be accelerated by cutting through the slab and any associated vapor barrier, exposing the pipe, cutting into the pipe, and removing any standing water with a vacuum truck or a submersible pump. Proposed locations of points of entry are shown in Figure 3. The blower system will be turned off while entry is underway. Two to three entries are proposed to be performed, as needed. It is recommended that the plumber who performed the installation work (Horner Plumbing) cut and remove each section of slab needed to expose the pipes and cut an entry point into the pipe. Water will then be pumped from the exposed pipe until no more water can be removed. North Shore Environmental is proposed to perform vacuum truck services.

As with the sump pits, water will have to be containerized and characterized prior to disposal. It is anticipated that water will be able to be disposed of into the combined sewer system in accordance with the MMSD NOI.

An airtight inspection port will be installed where penetrations occur to aid in future inspections and provide entry for pumping of water, as necessary. After pumping of the water is complete, the excavation will be backfilled with granular material to the bottom of the slab, an equivalent vapor barrier to surroundings will be placed and sealed, and concrete will be poured to bring the slab back to grade. The blower system will be turned on after sufficient curing of the concrete.

Excavated soils from the SSDS system entries will be containerized in properly labeled 55-gallon drums and disposed of appropriately at a landfill.

C. Stormwater Management Analysis
As it is suspected that stormwater intrusion is the root cause of water in the SSDS piping, a holistic analysis of the stormwater management system for the building will be performed. Stormwater has been observed entering the building at ground level in Buildings 1B-SE and 1B-SW indicating potential intrusion in the sub-slab as well. Currently, rooftops are pitched and concentrate

rainwater and snow melt toward Building 1C with various pipes running under the building before presumably discharging into the combined sewer system. This system needs closer evaluation to determine if it is the source of water that has caused depressurization and what solutions can be implemented to prevent future occurrences. A review of plumbing plans, current and historic, will be performed. Televising downspouts to their outlet will be considered and performed. An analysis of the stormwater management system will be made. Corrections of deficiencies will be made if identified. Corrections may include an increase in grading away from the building to reconfiguration of the stormwater management system to lining of damaged pipes.

D. Source Removal
Whenever there is an additional excavation, all soils will be considered contaminated with TCE and be disposed of at a landfill. Also, contaminated water generated from the VMS and additional work will be disposed of in accordance with all Local, State, and Federal regulations.

2. Restoration of Depressurization

A. Installation of Larger Blowers
Two 7.5 HP KS09 blowers were mobilized to the site by Fliteway Technologies on April 1, 2023 to supplement the two 10 HP KS09 blowers that were initially installed in February 2023. The 10 HP Blowers were then configured to draw vapors from the longest SSDS runs while the 7.5 HP blowers were configured to draw vapors from the two shorter runs. The locations of the blowers and the affected legs are shown on Figure 4.

Water is being collected in knockout tanks of the blowers and is manually drained at the beginning of each workday into 350-gallon totes. Approximately 30 to 70 gallons a day are being removed from the northern 10 HP blower. Approximately 10 to 30 gallons a day is observed in the southern 10 HP blower. No water is accumulating in the 7.5 HP blowers. Approximately 750 gallons of water are temporarily stored on site in 55-gallon drums. Two water samples have been collected were tested for VOCs for disposal characterization. Test results indicate that low levels of VOCs are present and that water will be able to be discharged to the combined sewer under the approved NOI.

The ability of the blowers to remove water is indicated by rising TCE concentrations in the exhaust indicating a zone of influence expanding to more contaminated areas. The addition of new blowers has not restored negative pressure beneath the residential units of buildings 1B-SW and 1B-W although vapor pin measurements show adequate depressurization beneath the rest of the East Block. The pace at which depressurization is being restored will need to be increased.

B. Verify Vapor Mitigation in Northern Mechanical Room
The Northern Mechanical Room extraction point to the sub-slab was sealed prior to April 11, 2023. On April 11, 2023, a site visit indicated that the fan was running. The room was ventilated on April 11, 2023. Sub-slab vacuum measurements are required to document that adequate depressurization is occurring as well as multiple air quality results before the room can be

considered free of vapor intrusion. A manometer will be required to be added to the extraction pipe to visually verify depressurization is occurring.

C. Supplemental SSDS Installation and Operation

To restore depressurization in Buildings 1B-W and 1B-SW in an accelerated manner, we will install and operate a supplemental SSDS until the water issues in the original SSDS are rectified. The supplemental SSDS will be used as a backup if the SSDS is affected by water intrusion again or if it goes down for any other reason. Vapor extraction points will be installed in Units 1045 and 1050 and other units. One vapor extraction point per residential unit is proposed as shown in Figure 5. We will evaluate during the installation process via pressure field extension how many Radon-type fans will be required to provide adequate supplemental depressurization. We are proposing to utilize Obar Systems fans initially, please refer to a sample manufacturer sheet in Attachment B. The installation of the fans will be overseen by a National Radon Proficiency Program (NRPP) certified Radon professional and vented at least 1 foot above the roof line. The restoration of depressurization under the building will assist in identifying cracks, gaps, and holes by pulling in smoke. Because of the National Register for Historic Places designation, routing of the outlet piping up stairwells to the roof is planned. The fans and outlets are proposed to be a permanent part of the system on a different circuit than the blowers to provide redundancy for the system.

D. Blower System Reconfiguration

Once the SSDS system has been cleared of water and the Obar fans have been installed, steps will be taken to improve the performance of the blower system. In addition, reconfiguring the blower system to shorten the runs and draw more vacuum over the most contaminated areas will be explored. A new blower, potentially an Airtech Vacuum 3BA1500 2 HP Blower, would be installed at the north end of the piping run underlying buildings 1B-W and 1B-SW and the connection to the southern blower connection would be capped. Characteristics of the Airtech Vacuum 3BA1500 2 HP Blower are included in Attachment C. The principal advantage of the Airtech Vacuum 3BA1500 2 HP Blower is that it can be run on single phase electrical power and will be able to work with the existing electrical system while a three-phase blower may require much more significant electrical work to provide a connection. The location of the proposed blower and proposed changes to the system are shown in Figure 6. Because of the National Register for Historic Places designation, routing of the outlet piping up a stairwell to the roof is planned.

The advantage of the reconfigured system is that the greatest vacuum and air flow would be achieved in the highest areas of contamination and the blower would be better able to remove water from the system and potentially clear itself in the event of future stormwater intrusion. Water recovered from the system would need to be characterized and properly stored prior to discharge.

A pilot test would be required on the proposed blower and reconfigured SSDS piping in order to assure proper sizing and to ensure adequate depressurization is achieved.

Water recovered from the piping will be containerized in drums, characterized, and properly disposed of. KSingh has an approved Notice of Intent from the MMSD for disposal of contaminated

purge water from the monitoring wells on the site. If characterization results are consistent with the Notice of Intent approval, disposal to the combined sewer system in accordance with the requirements of the Notice of Intent is proposed. A pair of GAC units will be mobilized if concentrations of VOCs are too great to be discharged to the sewer without treatment. Testing will be performed prior to treatment, between GAC units, and at the outlet of the GACs once per discharge event to document the waste stream, monitor the first GAC for breakthrough, and compliance with effluent limits. Alternatively, a vacuum truck or tanker will be utilized to transport the water to an appropriate disposal facility.

3. Sealing of Points of Entry

A. Portable GC Testing

KSingh has been working in conjunction with Hartman Environmental Geoscience to measure air quality and determine sources of intrusion utilizing a portable Gas Chromatograph (GC). The portable GC has allowed KSingh to determine several points of intrusion and direct sealing operations. The work is ongoing until air quality is restored, and the project moves into the clearance phase. The portable GC testing is proposed to continue and will specifically be used to monitor real time progress when sub-slab depressurization is achieved.

B. Sealing of Joints, Cracks and Holes

Inspection activities have documented numerous holes, cracks and gaps in the East Block complex. Activities are in progress. The sump crock in the northern mechanical room has been sealed with caulk. Sealing activities are in progress on the base of the wall / floor transition in Unit 1050.

The old brick wall separating Units 1045 and 1050 is of particular concern along with exterior building brick. A room-by-room inspection of Level 1 is planned to identify and correct additional points of concern.

Land Science has proposed sealing various components of the building with Retro-Coat to more effectively seal gaps and entry points. We are currently evaluating the option, but it may be a viable option for the floors of Buildings 1B-SW and 1B-W and for sealing the brick wall separating units 1045 and 1050. If the brick wall is sealed, we would propose to seal the same wall on Level 02 and Level 03. Please refer to Figure 7 for potential areas of sealing.

C. Southern Blowers Not Exhausting Above the Roofline

Exhaust piping will be added to ensure that exhaust occurs more than 1 foot above roof line. This will provide protection against exhaust vapor entering the building. The exhaust from the south blower is temporarily released at about six feet above grade as a part of commissioning plan implementation. Because of the historic nature of the building, the building is currently an applicant for the National Register of Historic Places, installation of piping along the exterior wall will require special consideration.

D. Patch 1052 Mechanical Room Floor and Cap Open Pipe

Mechanical Room 1052 has a section of the concrete slab removed to allow room for an elbow to the water main entering the building. There is also an uncapped 4-inch pipe in the room. Photographs of the deficiencies are included as follows.

It is proposed to cap the pipe, restore the vapor barrier, and place concrete to restore the slab integrity. The location of the Mechanical Room and noted deficiencies is shown in Figure 8. In addition, it is likely that the zone of depressurization will improve with additional points of entry sealed.

Schedule

The following schedule is proposed:

- Portable GC Testing (Ongoing) — Will continue as needed
- Installation of Additional Blowers (Installed) — Final adjustments by April 28, 2023
- Sealing of Joints, Cracks and Holes (Ongoing) — To be completed by April 28, 2023
- Vacuum Verification of Northern Mechanical Room Radon Fan — Ongoing – April 26, 2023
- Correction of Southern Blower Exhaust — April 18, 2023 to April 19, 2023
- Installation of Sealed Sump Pits — April 24, 2023 to May 19, 2023
- Extract Water from VMS by Entry into Piping System — April 30, 2023 to May 15, 2023
- Blower System Reconfiguration — April 30, 2023 to May 29, 2023
- Patch Room 1052 Mechanical Room Floor and Cap Pipe — April 18, 2023 to May 12, 2023
- Install Supplemental SSDS — April 24, 2023 to May 31, 2023
- Surface Sealing of Walls — May 1, 2023 to May 29, 2023
- Stormwater Management Analysis — April 18, 2023 to June 30, 2023

The schedule may need to be adjusted based on availability of contractors, availability of materials and parts, etc. The process to restore depressurization will be an iterative process. Some of these proposed steps may

need to be revised as we gather additional information. We request that you review the proposed corrective action plan as soon as possible. A review fee will be forwarded to the WDNR in a hard copy submittal. Please contact us if you have any questions or seek clarification regarding this submittal.

Sincerely,

K. SINGH & ASSOCIATES, INC.

Robert T. Reineke, P.E
Project Manager

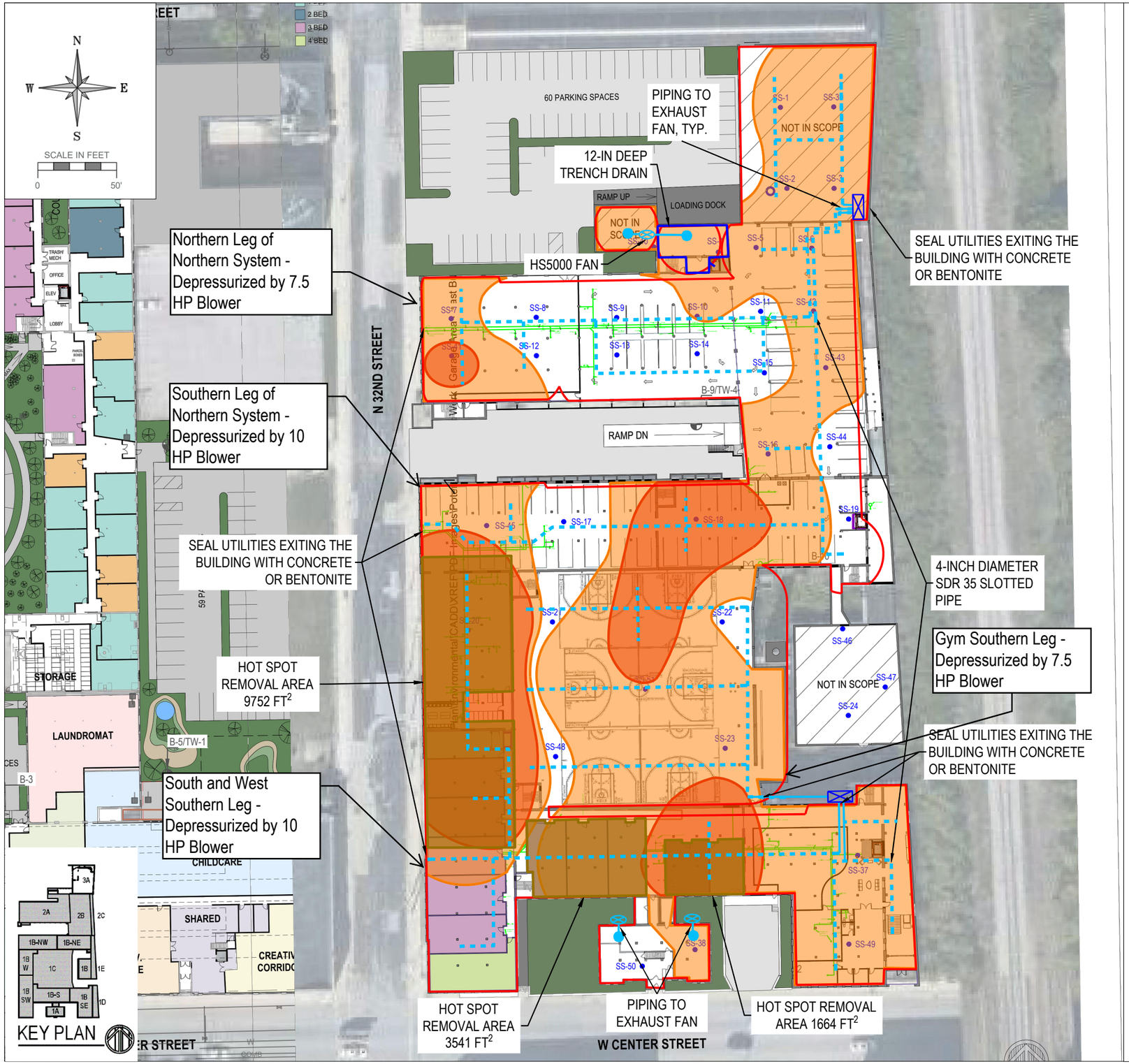
Pratap N. Singh, Ph.D., P.E.
Principal Engineer

cc: Shane LaFave / Roers Companies
Que El-Amin / Scott Crawford, Inc.
Robert Fedorchak, PE / Patriot Engineering

Figures:
Figure 1 – Vapor Mitigation System Design Layout
Figure 2 – Proposed Sump Pits
Figure 3 – Proposed Points of Entry
Figure 4 – VMS Blowers Configuration
Figure 5 – Potential Locations of Additional Fans
Figure 6 – Proposed Blowers Configuration
Figure 7 – Potential Areas of Surface Sealing
Figure 8 – Deficiencies in Mechanical Room 1052

Attachments:
Attachment A: Obar Systems Fan Data Sheet
Attachment B: Airtech Vacuum 3BA1500 2 HP Blower Data Sheet

FIGURES



LEGEND

- Sub-Slab Sampling Locations (51)
- Previous Boring and Temporary Well Locations
- Known Elevator Shaft
- 1 - Bedroom Apartment
- 2 - Bedroom Apartment
- 3 - Bedroom Apartment
- 4 - Bedroom Apartment
- Studio Apartment
- WI Residential VRSL Exceedance Extents
- WI Large Commercial / Industrial VRSL Exceedance Extents
- Hot Spot Removal Area
- Slotted Horizontal Extraction Piping
- Solid Horizontal Extraction Piping
- Extraction Points
- Extraction Point Zone of Influence
- Potential Blower Locations
- Vapor Mitigation Fan
- Zone of Influence
- 12-Inch Trench Drain
- Underground Plumbing
- Trench System Extents

NOTES:
1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE

3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171

CONSULTANT

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PROJECT TITLE: COMMUNITY WITHIN THE CORRIDOR
2748 N 32ND STREET
MILWAUKEE, WI 53210
PROJECT NUMBER: 40441

CLIENT: COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

REVISIONS	DATE	DESCRIPTION

DRAWN BY	DATE
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RR	04/02/2023

SHEET TITLE

VAPOR MITIGATION SYSTEM DESIGN LAYOUT

FIGURE 1

SHEET 16 of SHEET 17

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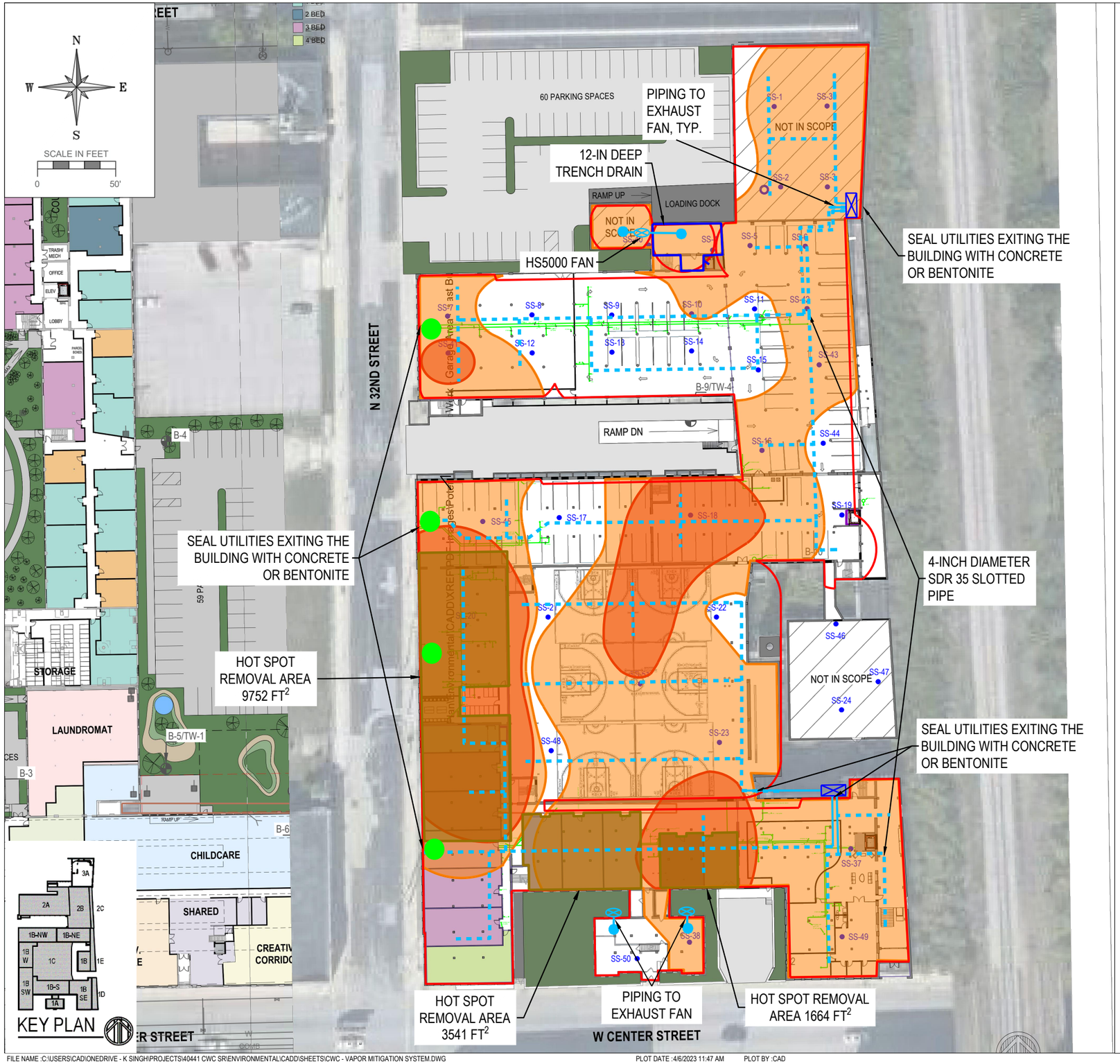

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Proposed Sump Pit

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PROPOSED SUMP PITS

FIGURE 2

SHEET 16 of SHEET 17

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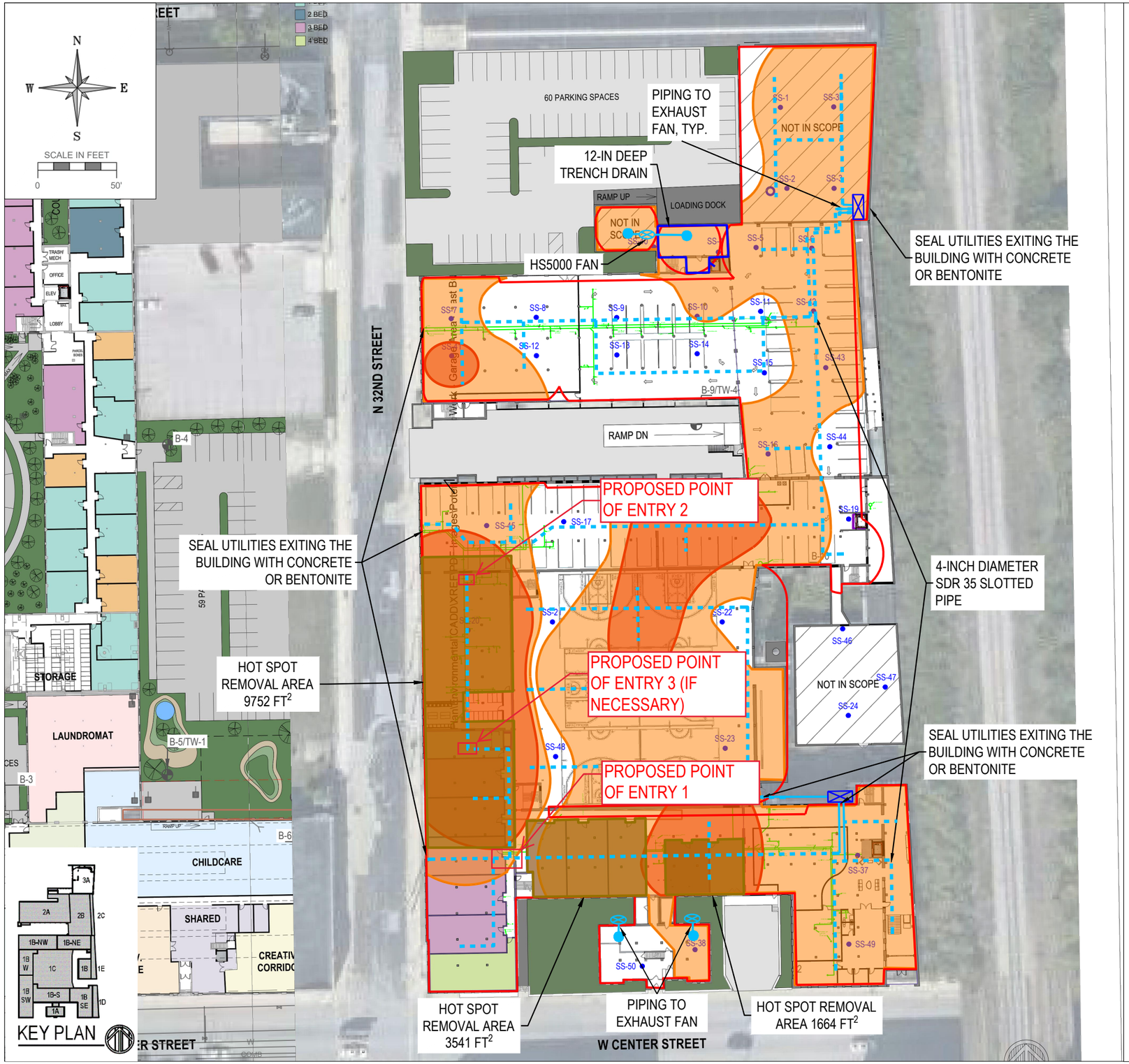

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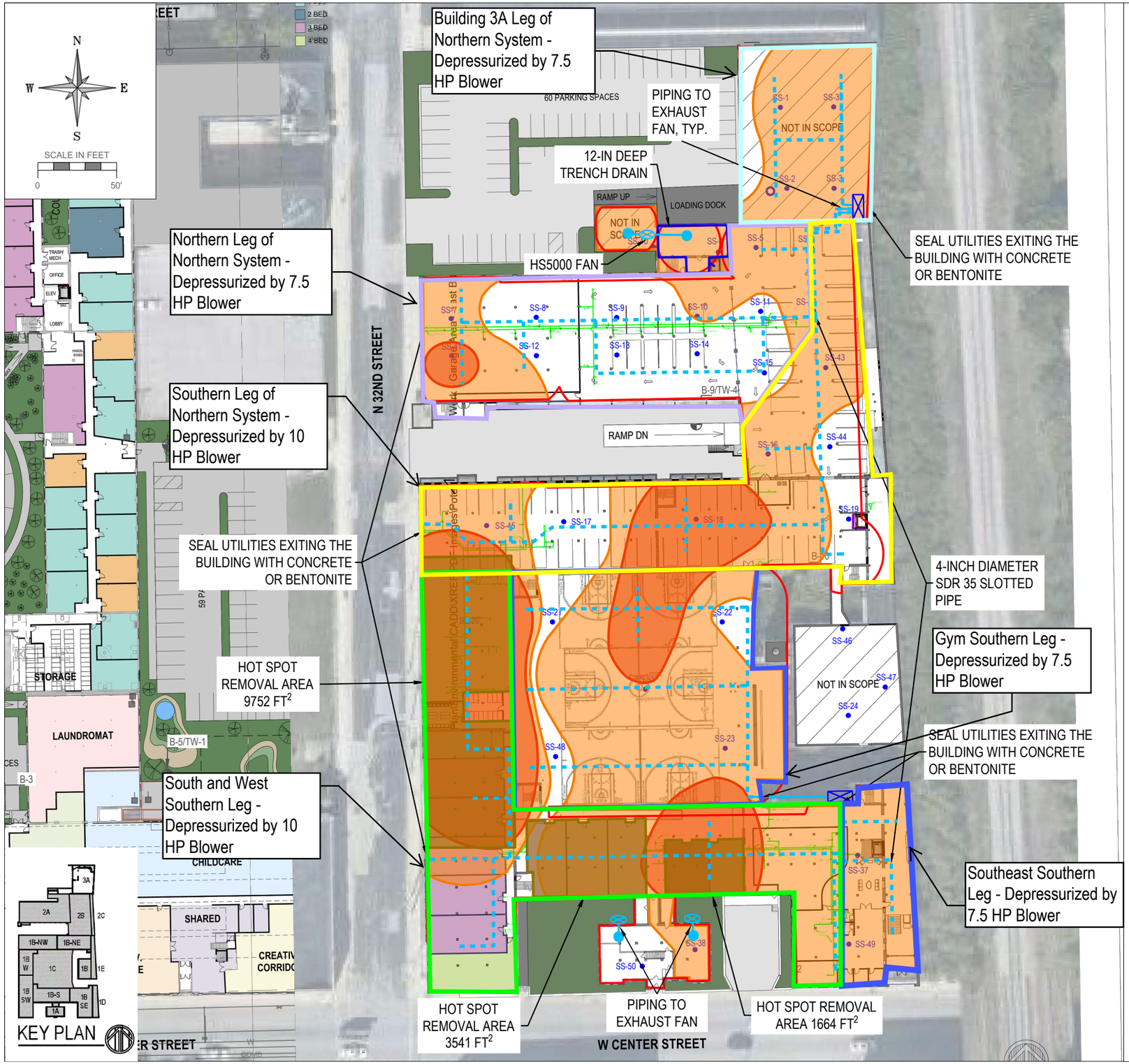
PROPOSED POINTS OF ENTRY

FIGURE 3



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VMS BLOWERS CONFIGURATION

FIGURE 4

SHEET 16 of SHEET 17

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East Building Level 1

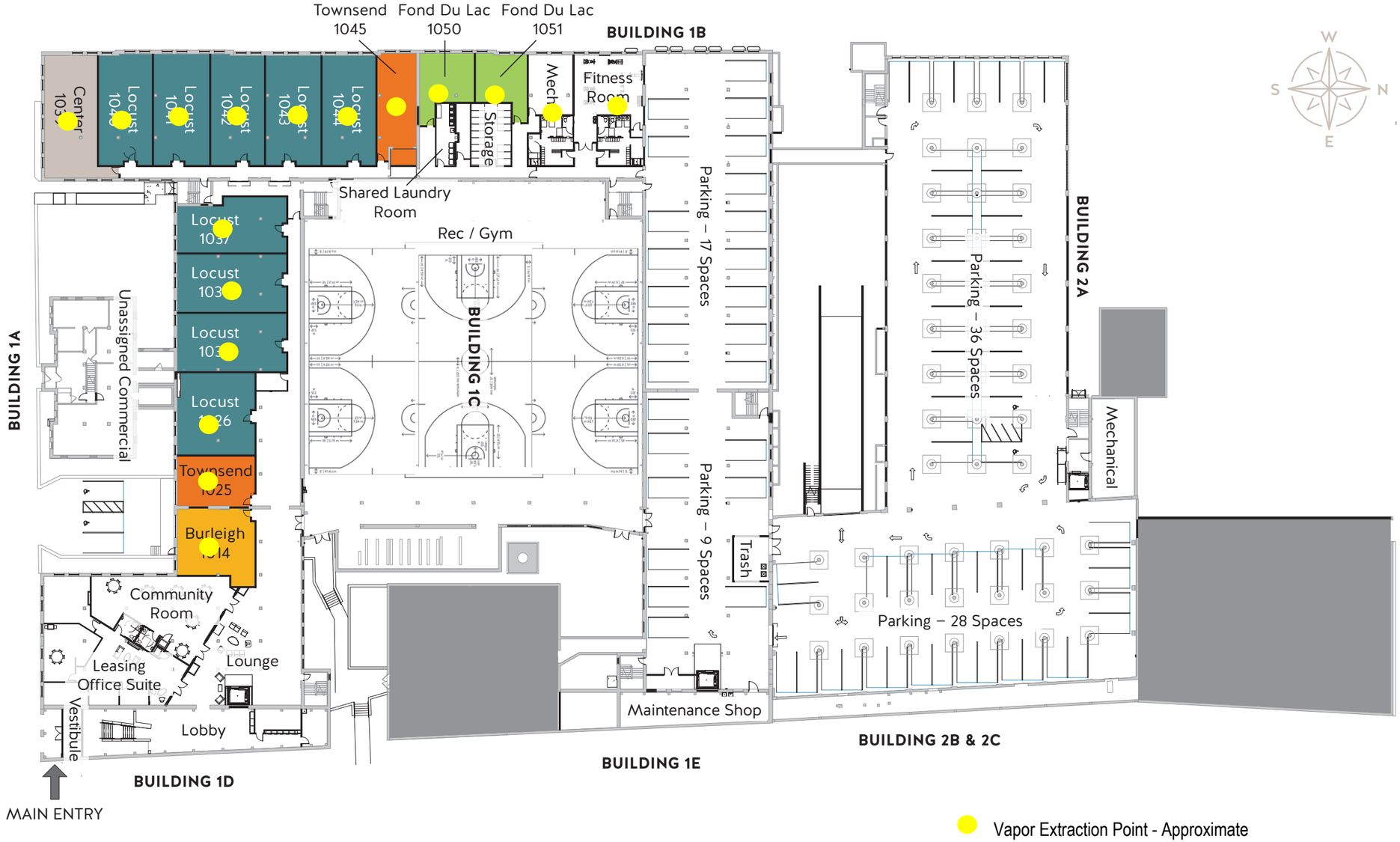
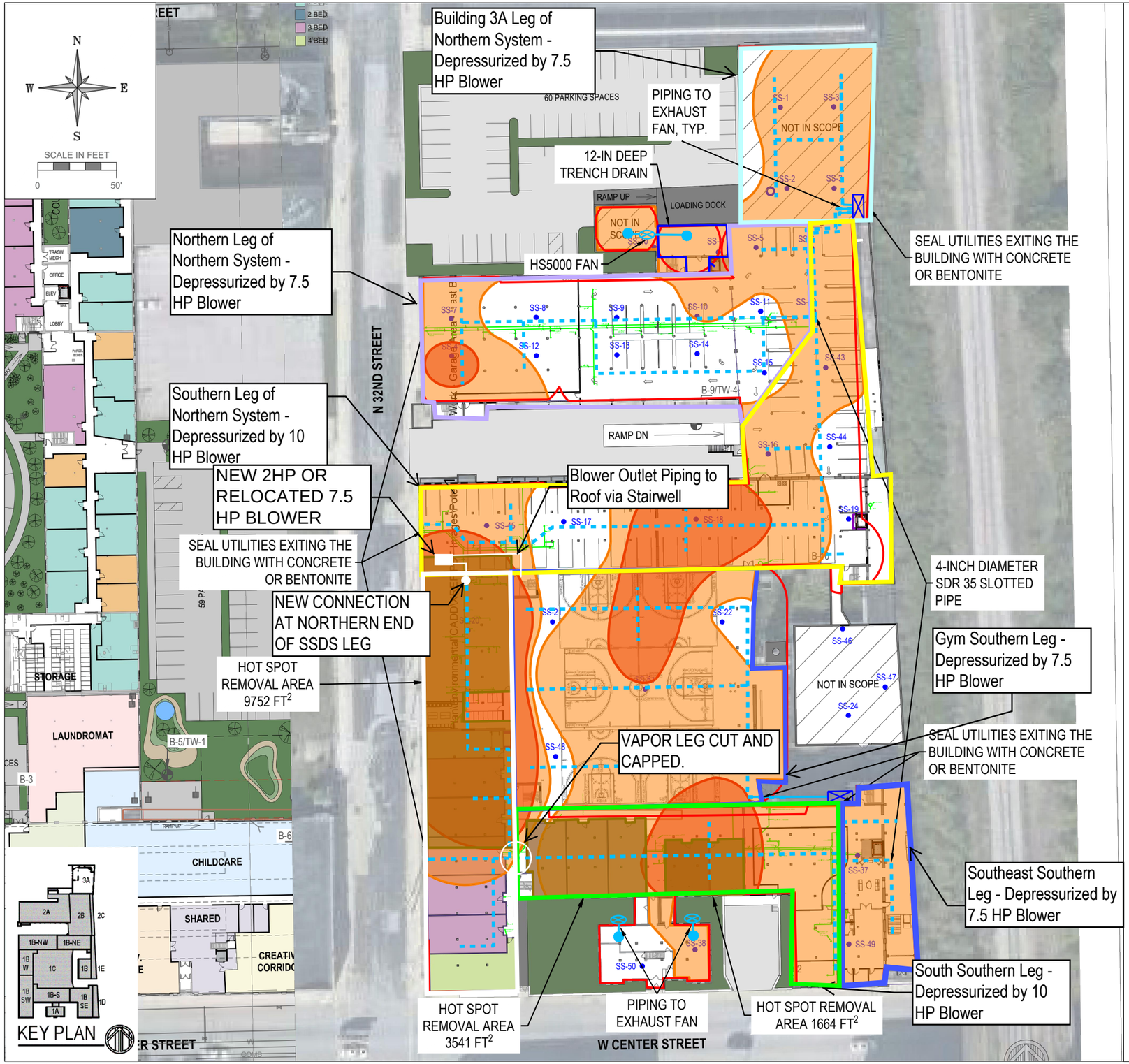


FIGURE 5. POTENTIAL LOCATIONS OF ADDITIONAL FANS



LEGEND

- Sub-Slab Sampling Locations (51)
- Previous Boring and Temporary Well Locations
- Known Elevator Shaft
- 1 - Bedroom Apartment
- 2 - Bedroom Apartment
- 3 - Bedroom Apartment
- 4 - Bedroom Apartment
- Studio Apartment
- WI Residential VRSL Exceedance Extents
- WI Large Commercial / Industrial VRSL Exceedance Extents
- Hot Spot Removal Area
- Slotted Horizontal Extraction Piping
- Solid Horizontal Extraction Piping
- Extraction Points
- Extraction Point Zone of Influence
- Potential Blower Locations
- Vapor Mitigation Fan
- Zone of Influence
- 12-Inch Trench Drain
- Underground Plumbing
- Trench System Extents

NOTES:
1. SAMPLING LOCATIONS AND VAPOR EXTRACTION POINTS ARE APPROXIMATE

3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171

CONSULTANT

CONSULTANT

CONSULTANT

PROJECT TITLE: COMMUNITY WITHIN THE CORRIDOR
2748 N 32ND STREET
MILWAUKEE, WI 53210
PROJECT NUMBER: 40441

CLIENT: COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

REVISIONS	DATE	DESCRIPTION

DRAWN BY JDS	DATE 04/02/2023
CHECKED BY RR	DATE 04/02/2023

SHEET TITLE

PROPOSED BLOWERS RECONFIGURATION

FIGURE 6

SHEET 16 of SHEET 17

FILE NAME :C:\USERS\CADIONEDRIVE - K SINGH\PROJECTS\40441 CWC SR\ENVIRONMENTAL\CADD\SHEETS\CWC - VAPOR MITIGATION SYSTEM.DWG PLOT DATE :4/6/2023 11:47 AM PLOT BY :CAD

0.019

East Building Level 1

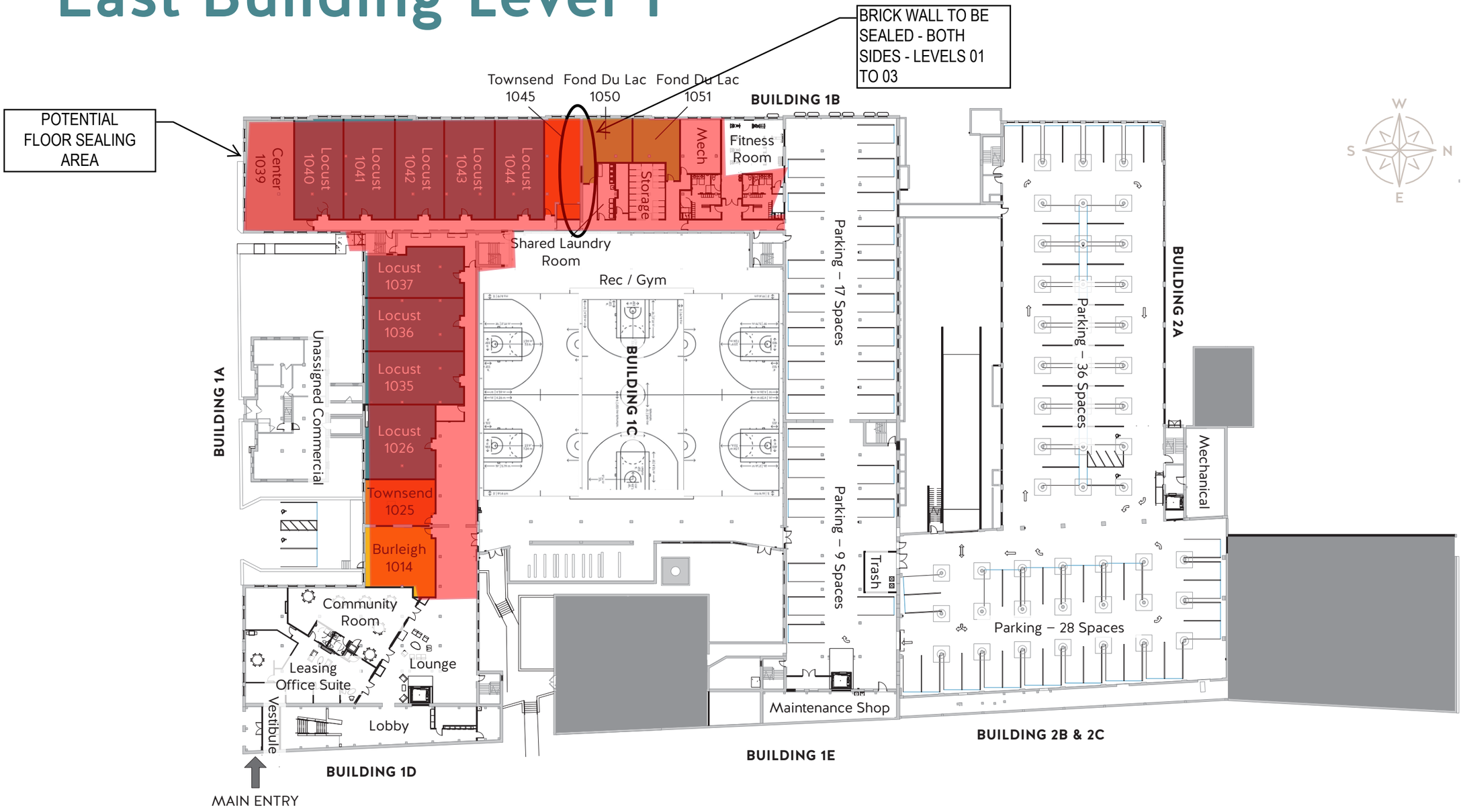


FIGURE 7. POTENTIAL AREAS OF SURFACE SEALING

East Building Level 1

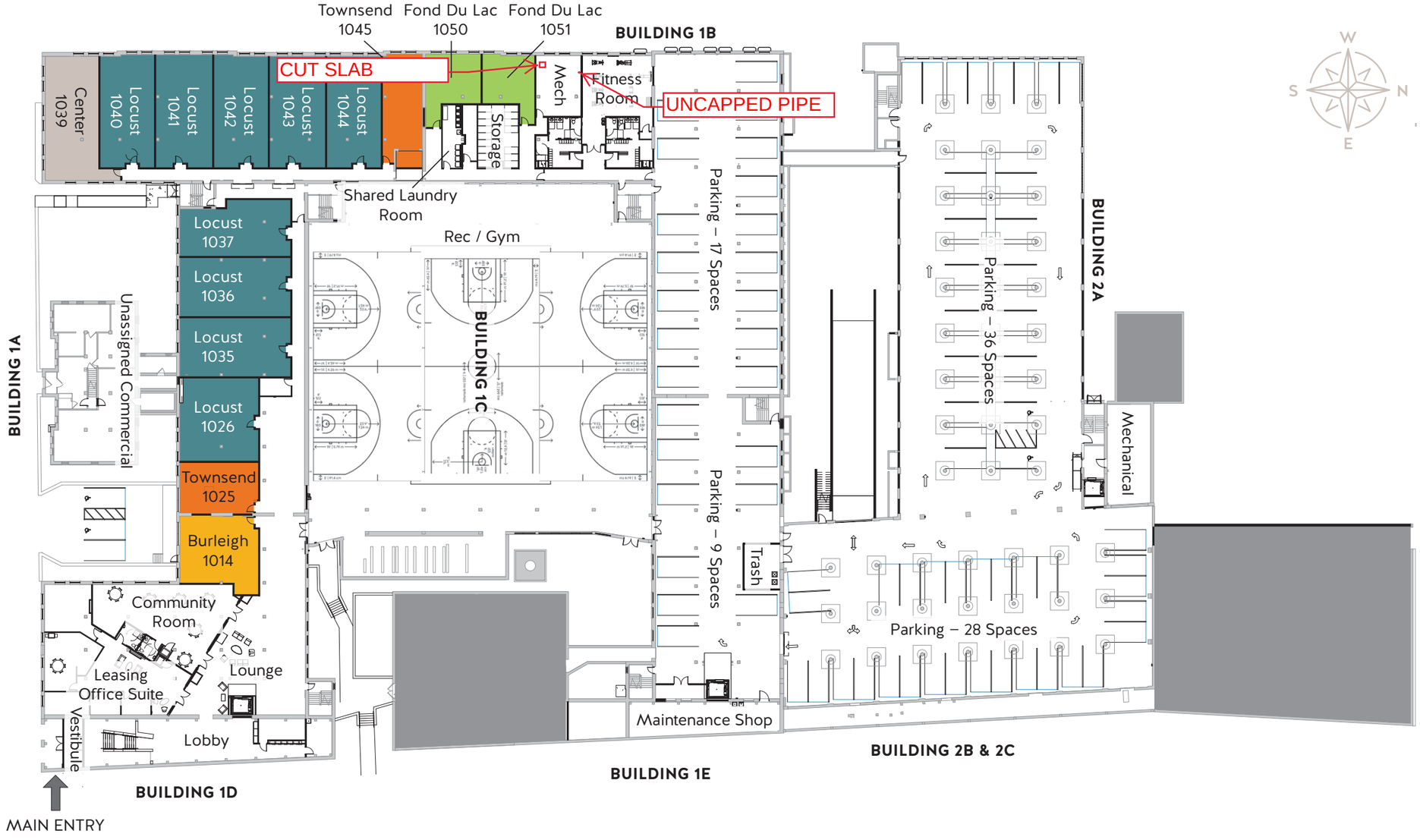


FIGURE 8. DEFICIENCIES IN MECHANICAL ROOM 1052

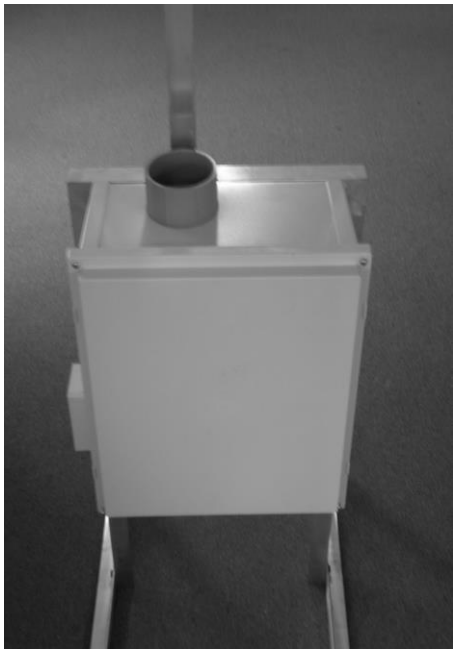
ATTACHMENTS

ATTACHMENT A
Obar Systems Fan Data Sheet

THE OBAR GBR76

COMPACT RADIAL BLOWER

Based on 25 years of experience and 2 years of research and development, the patent pending GBR series of compact radial blowers provide the perfect combination of performance and design.



GBR76 WITH ROOF MOUNT

PERFORMANCE

- GBR76 SOE 16" WC @ 0 Max flow 155 CFM.
- GBR76 UD 40" WC @ 0 Max flow 195 CFM.
- Built in speed control to customize performance.
- Condensate bypass built in.
- 12 month warranty - 40,000 hr sealed bearings.

DESIGN

- Our modular design means the blower and manifold assembly can be removed and replaced as a unit. This makes repairs cost effective and easy and allows contractors to upgrade systems simply by swapping assemblies.
- The GBR series is based on a bypass blower designed to handle combustible materials.
- The housing is not required to be air tight, so you can add gauges and alarms without compromising the system.
- Built in condensate bypass.
- Built in speed control.
- Quick disconnect electrical harness.
- All UL listed components including UL listed enclosure for outside use.
- Wall fastening lugs included.
- GBR series roof and wall mounts available to quickly configure the blowers for your installation while providing a custom built look.
- Compact design 16"x 14"x 8" weighing only 18 lbs.
- 3" schedule 40 inlet and exhaust.
- Universal Drive model accepts voltage from 120-240V without alteration

COST	GBR76 SOE	GBR76 UD
COMPLETE UNIT	**$1289.00**	**$1489.00**
3 YEAR WARRANTY	**$450.00**	**$550.00**

OBAR SYSTEMS INC 2969 ROUTE 23 SOUTH NEWFOUNDLAND NJ 07435 800 949 6227

GBR76 SOE	0”	2”	4”	6”	8”	10”	12”	16”	Wattage
SOE 16	150	140	129	118	105	90	75	35	150-320
SOE 12	125	115	100	83	62	39	0		110-200
SOE 8	105	90	70	42	0				60-120
SOE 4	75	50	0						37-50

GBR SOE performance using built in potentiometer set at sealed vacuums of 16, 12, 8, and 4” WC

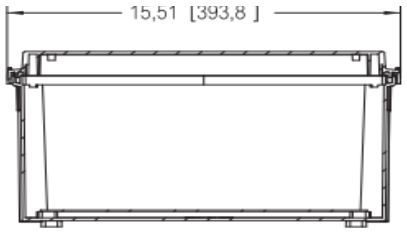
GBR76 UD	0”	10”	20”	30”	37”	Wattage
110V	195	158	118	63	20	700-870
220V	197	162	130	89	50	800-1100

Blower Specifications

Notes:

- **Input Voltage Range:** 108-132 Volts AC RMS, 50/60 Hz, single phase.
- **Input Current:** 6 amps AC RMS
- **Operating Temperature (Ambient Air and Working Air):** 0°C to 50°C
- **Storage Temperature:** -40°C to 85°C
- **Dielectric Testing:** 1500 Volts AC RMS 60 Hz applied for one second between input pins and ground, 3mA leakage maximum.
- **Speed Control Methods:** PWM (Pulse Width Modulation) (1 kHz to 10 kHz)
  0 to 10 VDC speed control.
  Mechanical: A potentiometer is available for speed control of the blower. The potentiometer can be preset for a specific speed. Access for speed adjustment located in motor housing.
- **Approximate Weight:** 4.8 Lbs. / 2.2 Kg
- **Regulatory Agency Certification:** Underwriters Laboratories Inc. UL507 Recognized under File E94403 and compliant under the CE Low Voltage Directive 2006/95/EC.
- **Design Features:** Designed to provide variable airflow for low NOx & CO emission in high efficiency gas fired combustion systems. Built with non-sparking materials. Blower housing assembly constructed of die cast aluminum. Impeller constructed from hardened aluminum. Rubber isolation mounts built into blower construction to dampen vibration within the motor. Two piece blower housing assembly sealed with O-ring gasket for combustion applications. Customer is responsible to check for any leakage once the blower is installed into the final application.
- **Miscellaneous:** Blower inlet, discharge, and all motor cooling inlet and discharge vents must not be obstructed. Motor ventilation air to be free of oils and other foreign particles, (i.e. breathing quality air). Blower is to be mounted so ventilation air cannot be re-circulated.
  POWER CONNECTION: Blower connector, AMP Universal MATE-N-LOK, part no. 1-350943-0.
  SPEED CONNECTION: Blower connector, Molex Mini-Fit Jr., part no. 39-30-3056.
  Mating harnesses available upon request.

Enclosure Specifications



Screw cover

Ratings:

Ingress Protection (EN 60529): 66/67

Electrical insulation: Totally insulated

Halogen free (DIN/VDE 0472, Part 815): yes

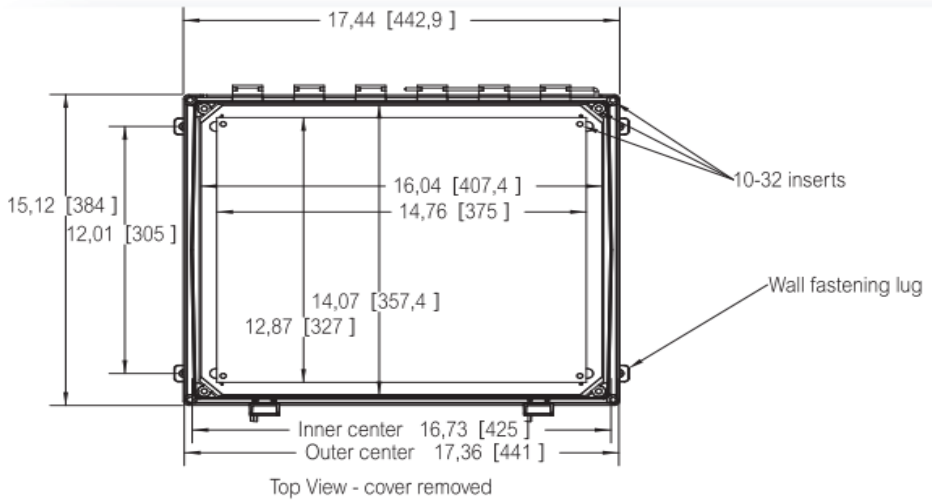
UV resistance: UL 508

Flammability Rating (UL 746 C 5): complies with UL 508

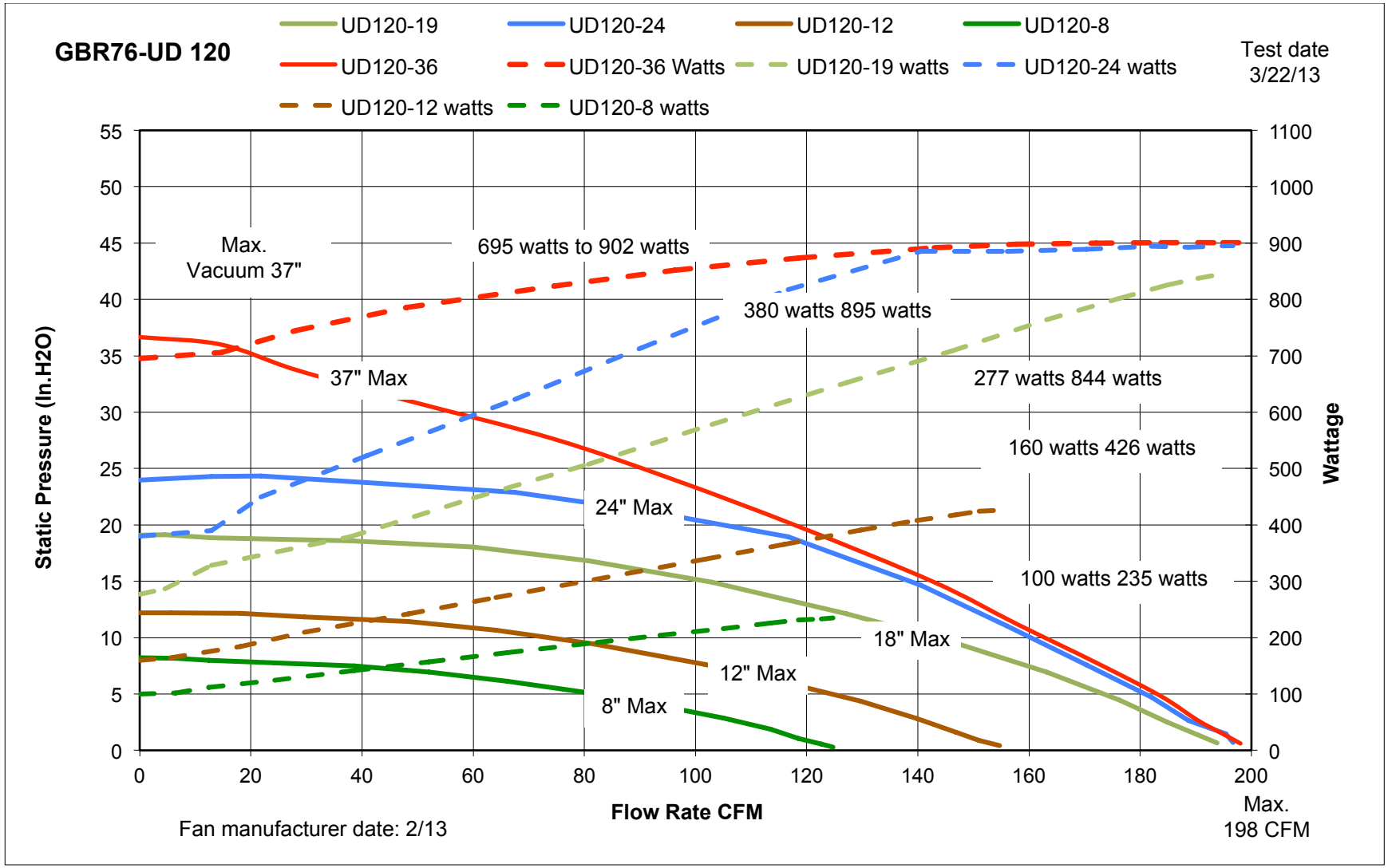
Glow Wire Test (IEC 695-2-1) °C: 960

NEMA Class: UL Type 4, 4X, 6, 6P, 12 and 13

Certificates: Underwriters Laboratories



Top View - cover removed


GBR76-UD 120
UD120-19
UD120-24
UD120-12
UD120-8
UD120-36
UD120-36 Watts
UD120-19 watts
UD120-24 watts
UD120-12 watts
UD120-8 watts
Test date
3/22/13
Max.
Vacuum 37"
695 watts to 902 watts
380 watts 895 watts
277 watts 844 watts
160 watts 426 watts
100 watts 235 watts
37" Max
24" Max
18" Max
12" Max
8" Max
Static Pressure (In.H2O)
Wattage
Flow Rate CFM
Max.
198 CFM
Fan manufacturer date: 2/13

Distributed by Obar Systems

Installation & Warranty

Read these instructions completely and retain for future reference.

1. Warning! The use of this fan may affect combustion devices, always check for a backdraft on all combustion devices before and after installation.
2. Warning! This fan is not intended for use in hazardous environments where a motor spark could ignite combustible or flammable materials.
3. All wiring must be performed by a licensed electrical contractor in accordance with the National Electrical Code and all local and state codes governing the municipality in which it is installed.
4. The GBR series blowers are intended for use and installation by professionals familiar with installation and design of systems for the remediation of radon and volatile organic compounds. Unqualified or unlicensed individuals should not undertake the installation or service of this product.

INSTALLATION

The installation instructions provided are for guidance only, any installation should meet all state and local codes and guidelines.

1. Temperature restrictions: The GBR SOE/UD will run and start in a temperature range from -20 to 180 degrees F. The GBR HA will run at a temperature of -20 to 180 degrees F but may not start if the motor temperature is below 0 degrees F at time of startup.
2. Ground water restrictions: The blower should not be installed at a height above water table that is less than the vacuum setting for the blower, if the water table is unknown then the base of the slab should be used as a default. The GBR series is a high vacuum blower and will draw water into the assembly and damage the impeller and motor if not properly installed.
3. Speed control: The GBR series blowers have a built in speed control that can be used to field adjust the vacuum on your system. These should only be adjusted by an experienced installer familiar advanced systems design and installation. For information regarding on site adjustments please contact Obar Systems for further information.
4. Enclosure: It is not recommended that the enclosure be opened except for repairs and adjustments. Contact Obar Systems before removing the cover.
5. Mounting: The fan should be mounted in a vertical orientation with the discharge pointing

upward. The inlet and discharge should be attached with a PipeConx or similar flexible connector of the appropriate size. The connector should provide a gap of 1.5 inches between the inlet pipe and inlet fitting and discharge pipe and discharge fitting. This will allow for motor assembly replacement in future repairs. The GBR comes with wall fastening lugs that provide for a flush installation on a flat even surface. Optional roof and wall mounts are available and are designed to reduce installation times dramatically. Contact Obar Systems for additional information on mounting systems. The fan should be located in an area that provides easy access and does not obstruct the operations of the building to which it is attached.

6. Discharge: Make sure the discharge meets or exceeds National guidelines and local codes for the installation and venting of Radon and or VOCs (Volatile Organic Compounds). In the event that there is the possibility of debris entering the discharge of the fan, it is recommended that a guard be installed to protect the blower from damage.

Warranty

Subject to any applicable consumer protection legislation, Obar Systems warrants the GBR series fans for 12 months from the date of purchase.

Obar systems will repair or replace any fan which fails due to defects in materials and workmanship. A RMA must be obtained and proof of purchase is required to be serviced by this warranty.

This warranty is contingent upon the fan having been installed as per the installation requirements set forth by Obar Systems and in accordance with the requirements of federal and state authorities governing the installation systems designed for radon and volatile organic compounds.

Obar systems is not responsible for the installation, removal or delivery costs associated with this warranty.

Except as stated, the GBR series are provided without warranty of any kind, either expressed or implied, including without limitation, implied warranties of merchantability and fitness for a particular use.

Obar systems is in no way responsible for any direct or indirect damages relating to the performance of the GBR series fan. Any liability shall not exceed the purchase price of the unit. The sole remedy under this warranty shall be the repair or replacement of the unit

Contact Obar Systems to obtain a RMA (Return Material Authorization) number for any and all warranties. If return is required, the customer is responsible for all freight charges.

Obar Systems Inc.
2969 Route 23 South
Newfoundland NJ 07435
800 949 6227

ATTACHMENT B
Airtech Vacuum 3BA1500 2 HP Blower Data Sheet

AIRTECH® VACUUM

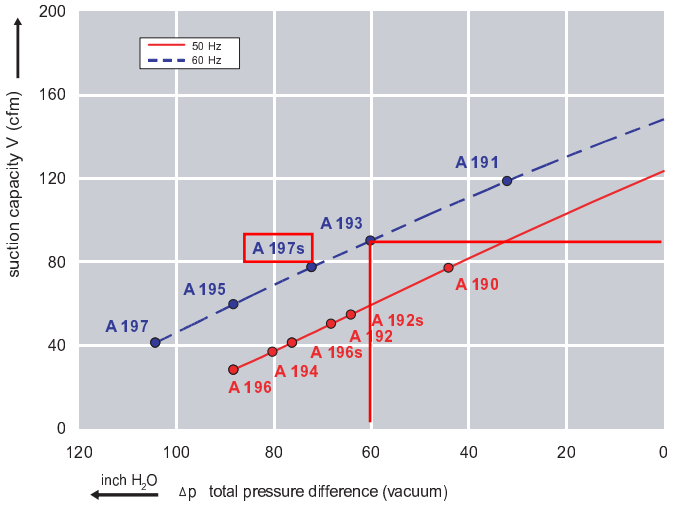
3BA1500

Vacuum/Pressure Regenerative Blower

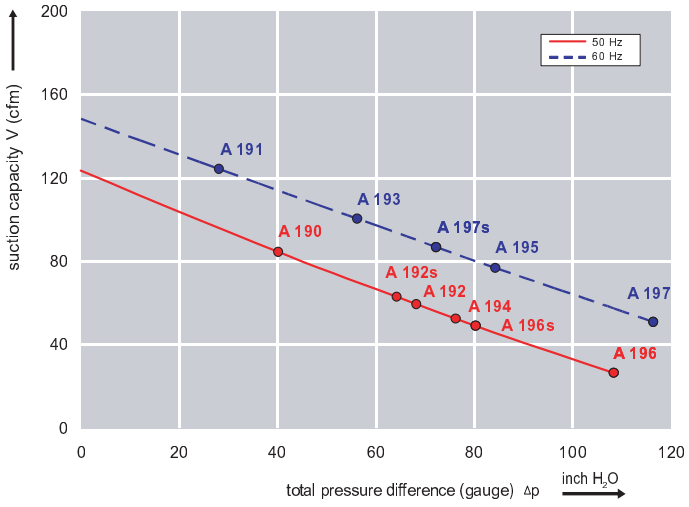
Features:

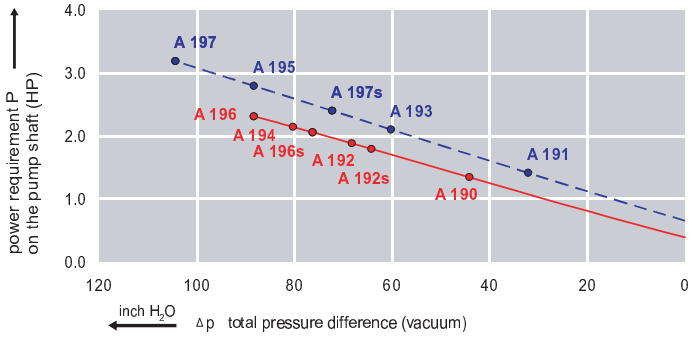
- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
  Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

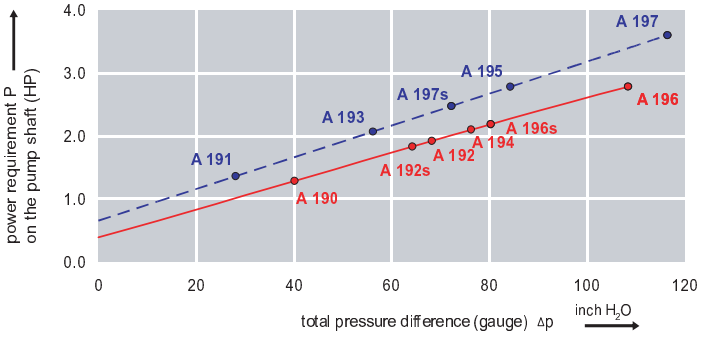
Performance curve for Vacuum pump

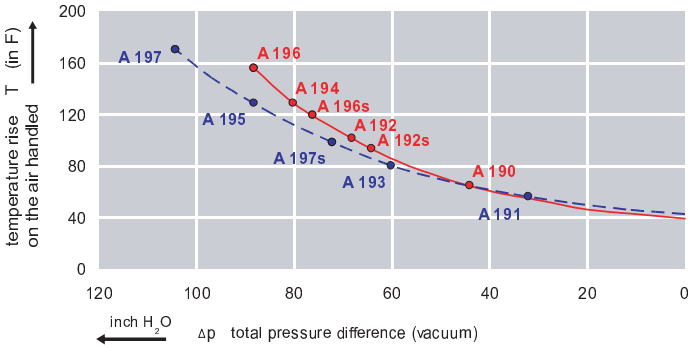


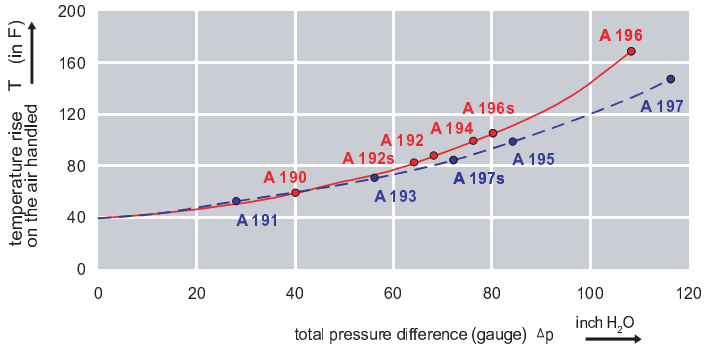
Performance curve for Compressor







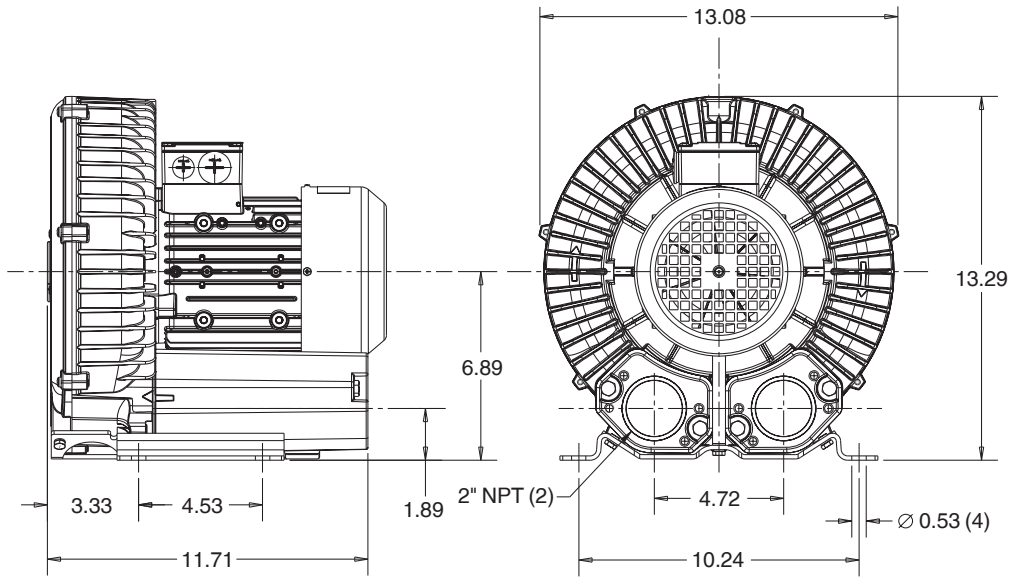




3BA1500

Vacuum/Pressure Regenerative Blower

Dimensions: (inches)



Recommended Accessories:

Relief valve:

VC61Z (Vacuum)

PC61Z (Pressure)

Filter:

ATF-200-15124/1 (Vacuum)

AFS-30-200-10 (Pressure)

Specifications subject to change without notice. Please contact factory for specification updates.

Selection & Ordering Data - Type 3BA1500

Curve No.	Order No.	Frequency Hz	Rated power HP	Input voltage V		Input current A		Permissible total differential pressure Vacuum inch H2O	Permissible total differential pressure Compressor inch H2O	Sound pressure level dB(A)	Weight lbs
3~ 50/60 Hz IP55 insulation material class F											
A 190	3BA1500-7AT06	50	1.14	200D ... 240D	345Y ... 415Y	4.2D	2.4Y	-44	40	64	40
A 191	3BA1500-7AT06	60	1.27	220D ... 250D	415Y ... 460Y	4.35D	2.5Y	-32	28	70	40
A 192	3BA1500-7AT16	50	1.74	200D ... 240D	345Y ... 415Y	5.7D	3.3Y	-68	68	64	44
A 193	3BA1500-7AT16	60	2.0	220D ... 250D	415Y ... 460Y	5.5D	3.2Y	-60	56	70	44
A 194	3BA1500-7AT26	50	2.14	200D ... 240D	345Y ... 415Y	7.5D	4.3Y	-80	76	64	46
A 195	3BA1500-7AT26	60	2.75	220D ... 250D	415Y ... 460Y	7.5D	4.4Y	-88	84	70	46
A 196	3BA1500-7AT36	50	2.95	200D ... 240D	345Y ... 415Y	9.7D	5.6Y	-88	108	64	55
A 197	3BA1500-7AT36	60	3.42	220D ... 250D	415Y ... 460Y	9.0D	5.3Y	-104	116	70	55
1~ 50/60 Hz IP55 with attached capacitor for continuous operation											
A 196s	3BA1500-7AS35	50	2.0	115	230	22.0	11.0	-76	80	64	48
A 197s	3BA1500-7AS35	60	2.35	115	230	24.0	12.0	-72	72	70	48

Suitable for 208 Volt Operation

All curves are rated at 14.7 psia and 68° F ambient conditions and are reported in SCFM referenced to 68° F and 14.696 psia sea level conditions. Curve values are nominal, actual performance may vary by up to 10% of the values indicated. For inlet temperatures above approximately 80 °F or for handling gases other than air, please contact your Airtech sales representative for assistance.