

November 1, 2018



Wisconsin Department of Natural Resources
Waukesha Service Center
141 NW Barstow Street
Waukesha, Wisconsin 53188

Attention: Mr. Dave Volkert

Submitted Electronically

Re: **Vapor Intrusion Indoor Air Quality Monitoring and SSDS Inspection Work Plan**
Clare Central Apartments
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin
Terracon Project No. 58107058A
WDNR BRRTS #02-41-549867
VPLE BRRTS #06-41-560680

Dear Mr. Volkert:

Terracon Consultants, Inc. (Terracon) prepared this work plan on behalf of Telos, Inc. (Telos) to address the Wisconsin Department of Natural Resources (WDNR) request for continued ambient indoor air quality (IAQ) monitoring and sub-slab depressurization system (SSDS) inspections at the Clare Central apartment complexes located at 1003 and 1033 Atkinson Avenue, Milwaukee, Wisconsin (site). The status of supplemental vapor mitigation system design associated with the elevator shafts is also presented. The following sections present the proposed scope of work and schedule.

1.0 INDOOR AIR QUALITY MONITORING AND SSDS INSPECTIONS

The WDNR recommended that “ambient air sampling in the two apartment buildings be completed quarterly until the potential vapor pathway due to the elevators in each apartment building is mitigated. Ambient air sampling is needed to ensure the air doesn’t contain contaminants in concentrations exceeding the indoor air vapor action levels. Please continue to follow the sampling procedures used in the last sampling event”.

Quarterly indoor ambient air sampling will be performed per the table below. The objectives are to collect 2 ambient air samples per floor from each building and utilize the naming conventions/sampling locations consistent with the July 17, 2013 sampling performed by the Wisconsin Department of Health Services (DHS) and the Milwaukee Health Department (MHD). Terracon’s intent/assumption is that access will be provided for us to collect samples from the same areas/apartment units. The ambient air sampling locations and sample names are presented on the attached exhibits.



Terracon Consultants, Inc. 9856 South 57th Street Franklin, Wisconsin 53132
P (414) 423-0255 F (414) 423-0566 terracon.com

Geotechnical



Environmental



Construction Materials



Facilities

<u>Sample Location</u>	<u>Matrix/Analyses¹</u>	<u>No. of Samples</u>	<u>Lab Method</u>
Clare Apartment: 1003 West Atkinson	Ambient Air Samples: Chlorinated Volatile Organic Compounds (CVOCs) 1. 1003 Sump Closet (1 st Floor) 2. 1003 Unit #1 Kitchen (1 st Floor) 3. 1003 Mechanical Closet (2 nd Floor) 4. 1003 Storage Room (2 nd Floor)	4	TO-15
Clare Apartment: 1033 West Atkinson	Ambient Air Samples: CVOCs 1. 1033 Unit #2 Kitchen (1 st Floor) 2. 1033 Unit #3 Kitchen (1 st Floor) 3. 1033 Unit #6 Kitchen (2 nd Floor) 4. 1033 Unit #7 Kitchen (2 nd Floor)	4	TO-15
Residence: 3618 North 11 th Street ²	Ambient Air Sample: CVOCs 3618 Basement	1	TO-15
Background-Outdoor Air	Ambient Air Sample: CVOCs 1033 Unit #5 or Porch (2 nd Floor)	1	TO-15

The SSDS inspections will evaluate operational integrity of the system, and manometer readings will be recorded. The inspections will be performed in general accordance with the Vapor Mitigation System Maintenance Plan dated May 28, 2018.

2.0 SUPPLEMENTAL VAPOR MITIGATION SYSTEM DESIGN

Both Clare Central Apartments (1003 and 1033 West Atkinson) have SSDSs to capture the soil gas/soil vapor beneath the living spaces of the apartments. The effectiveness of these systems has been verified. The SSDS pickup point locations are presented on the attached exhibits.

Ambient air sampling in the apartments supports that the SSDSs are effectively mitigating sub-slab vapor. However, the ambient air sample collected from the mechanical electric/utility closet

¹ Terracon will collect 24-hour ambient air samples in laboratory prepared 6-liter Summa canisters with a flow regulator calibrated for 24-hour collection. The ambient air samples collected within the Summa canisters will be submitted to the laboratory for analysis of tetrachloroethene (a.k.a. perchloroethylene or PCE), trichloroethene (TCE), trans-dichloroethene (DCE), cis-DCE, and vinyl chloride (VC) using EPA Method TO-15.

² The 3618 North 11th Street residence has been vacant. Terracon has made efforts to obtain access to perform basement ambient air sampling, and sub-slab depressurization system (SSDS) inspection with no success. Terracon will attempt to coordinate the residential sampling in conjunction with the Clare Central apartments ambient air sampling; however, if unoccupied and/or access unable to be obtained, Terracon will not be performed at this location.

on the second floor of the 1003 West Atkinson apartment building in September 2016 contained TCE at a concentration slightly below its residential vapor action limit (VAL). Because the TCE concentration was close to the VAL and considering that TCE concentrations could fluctuate and potentially be higher at other times, a proactive approach was initiated to further investigate the possible source and offer potential mitigation solutions.

In October 2016, Terracon retained Acura Services (Acura) to inspect the 1003 apartment second floor mechanical room and first and second floor elevator mechanical rooms. The ambient air sample, which was collected from the mechanical room on the second floor, is located just above the elevator mechanical room. Subsequent investigation found a possible vapor migration pathway from the elevator shaft floor into the elevator mechanical room, which may have contributed to the TCE detection in the second floor mechanical room above it. The elevator shaft floor is approximately 3 to 4 feet below the other floors such that it's not likely to be depressurized by the SSDS.

Personnel from Acura, Terracon, the elevator contractor, and the City of Milwaukee building inspector met on-site to discuss potential mitigation strategies to capture the soil vapor that may be entering the elevator shaft, and safely ventilating soil vapor to the exterior of the apartment building. It was concluded that the shaft is essentially a chimney capturing air/vapor in the shaft and routing air/vapor outside of the building should prevent the buildup of CVOCs entering the bottom of the shaft that could potentially enter living spaces.

In an April 17, 2017 meeting with the WDNR, Terracon presented this proposed approach, and the WDNR requested that they evaluate the plan prior to implementation. In their August 1, 2018 letter, the WDNR discussed the proposed mitigation plan and suggested that a blower at the top of the elevator shaft may cause additional vapor migration from the base of the elevator shaft. They requested an evaluation be performed to determine whether the base of the elevator shaft could instead be sealed. In addition, the WDNR requested that the 1033 apartment also be evaluated for potential mitigation in the elevator shaft.

The additional evaluation is ongoing. Once the evaluation is complete and the potential mitigation plans have been tentatively approved by the City of Milwaukee building inspector, Terracon will provide an updated plan to the WDNR for approval.

3.0 ANTICIPATED SCHEDULE

Terracon proposes to initiate these remedial actions as soon as possible upon client and WDNR authorization. Specifically, the proposed schedule is as follows:

TASK	ANTICIPATED SCHEDULE
Submittal of this IAQ Monitoring Work Plan	November 2018
Submittal of the Supplemental Vapor Mitigation System Design	December 2018
Ambient Air Sampling and SSDS Inspections	December 2018 March 2019 June 2019 September 2019
Submittal of Data Transmittals to the WDNR	January 2019 April 2019 July 2019 October 2019

We are requesting WDNR concurrence prior to the implementation of this Vapor Intrusion Indoor Air Quality Monitoring and SSDS Inspection Work Plan. Please contact us with questions/comments you may have.

Sincerely,



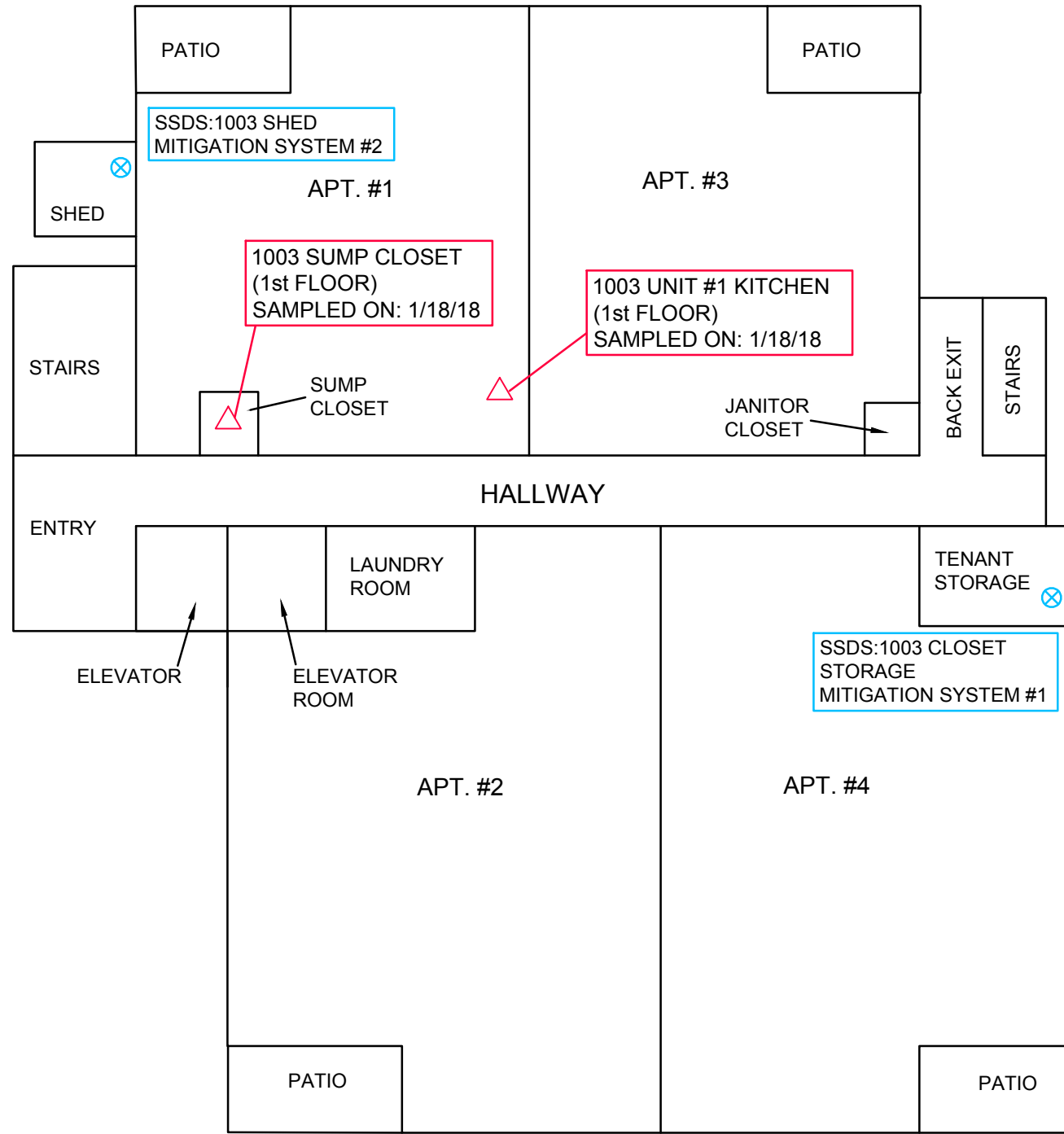
Timothy P. Welch, P.G.
Environmental Department Manager

Blaine R. Schroyer, P.E.
Office Manager/Principal

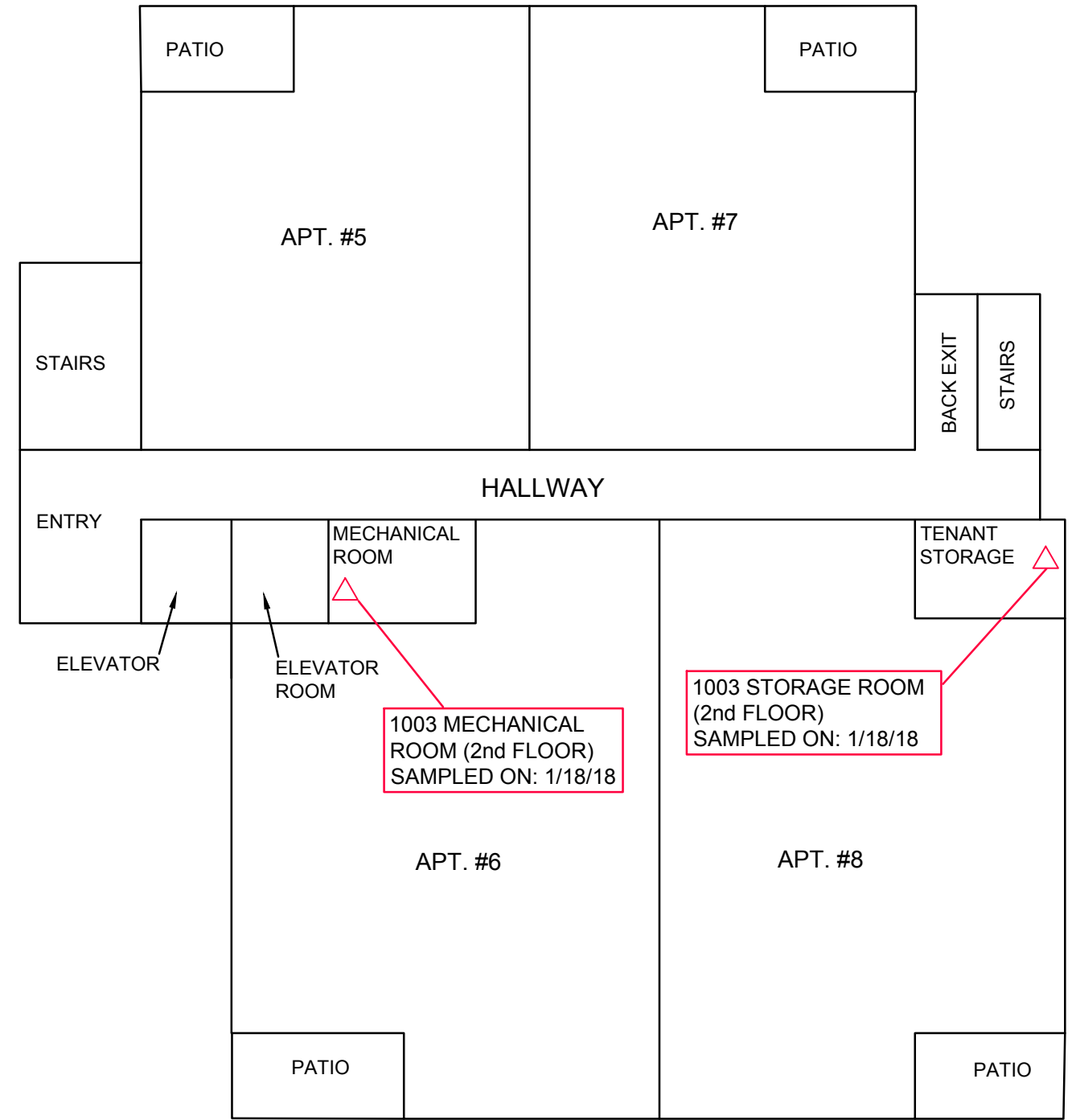
TPW/BRS:tpw/N:\Project Documents\2010\58107058A\Project Documents\Vapor Intrusion & Mitigation Workplan_11012018.doc

Attachments - Sub-slab Depressurization System & Ambient Air Sampling Locations-1003
Sub-slab Depressurization System & Ambient Air Sampling Locations-1033

Copy to: Margie Kidder, St. Clare Management (Electronically)
Don Gallo, Axley Brynelson (Electronically)



FIRST FLOOR



SECOND FLOOR



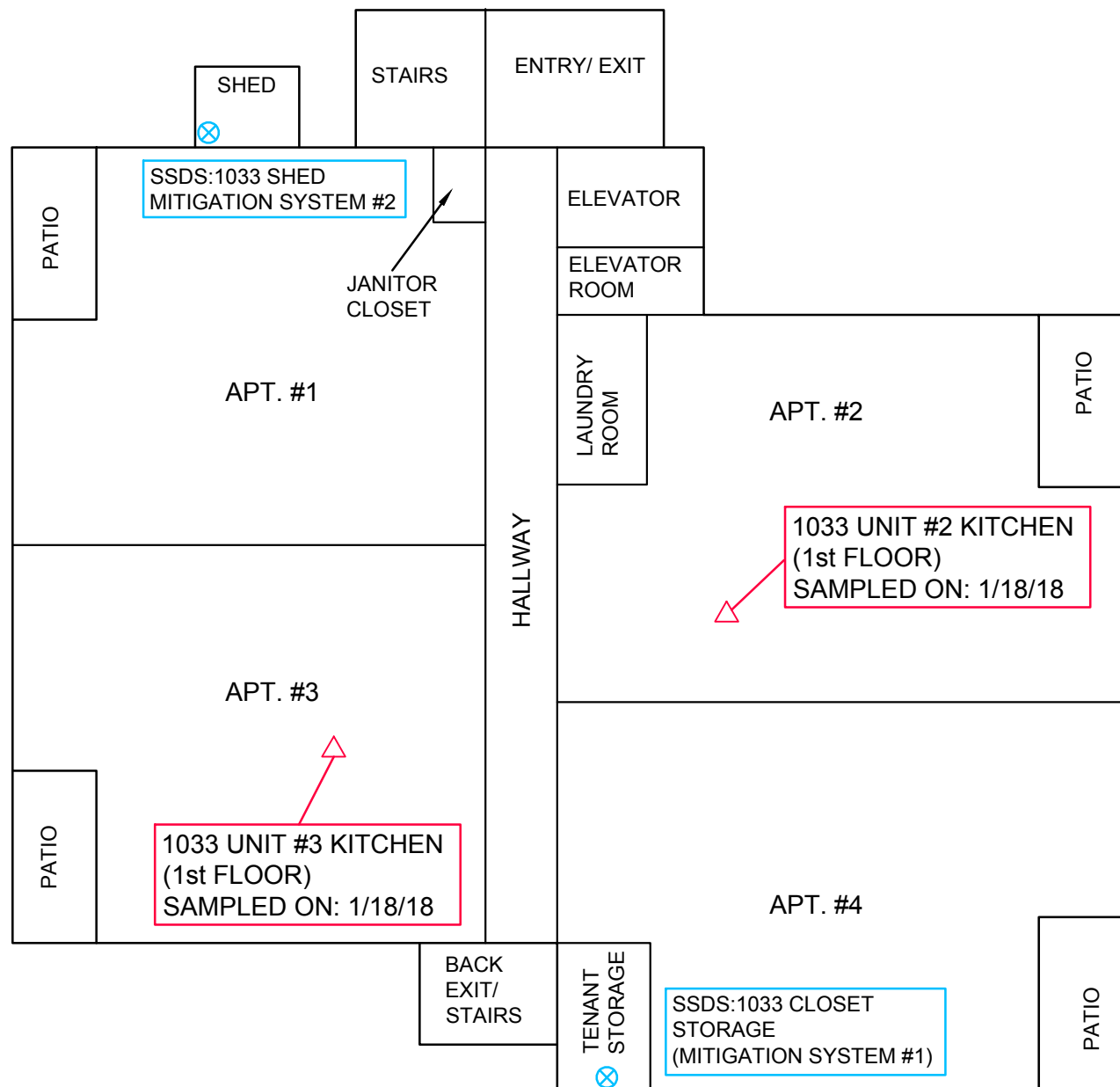
LEGEND	
△	AMBIENT AIR SAMPLE LOCATION
⊗	SSDS PICKUP POINT LOCATION
SSDS:	SUB-SLAB DEPRESSURIZATION SYTEM

Project Mngr:	TPW	Project No.	58107058
Drawn By:	JLM (41)	Scale:	NOT TO SCALE
Checked By:	DMB	File No.	58107058AC1R1
Approved By:	TPW	Date:	3/2018

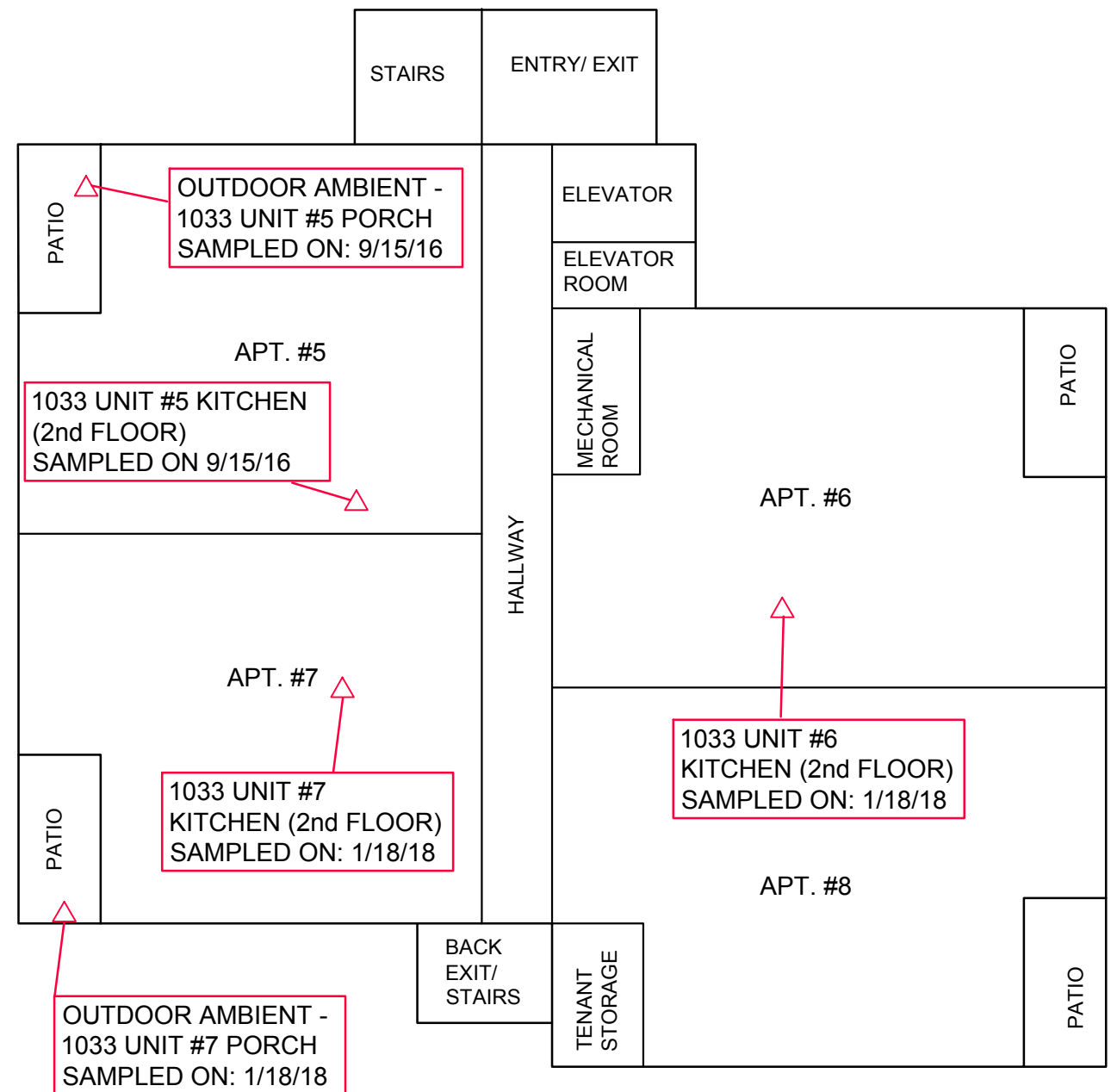
Terracon
 Consulting Engineers and Scientists
 9856 SOUTH 57th STREET FRANKLIN, WI 53132
 PH. (414) 423-0255 FAX. (414) 423-0566

SUB-SLAB DEPRESSURIZATION SYSTEM & AMBIENT AIR SAMPLING LOCATIONS - 1003 BUILDING	
CLARE CENTRAL APARTMENTS 1003 WEST ATKINSON AVENUE MILWAUKEE WISCONSIN	

DIAGRAM IS FOR GENERAL LOCATION ONLY AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.



FIRST FLOOR



SECOND FLOOR



DIAGRAM IS FOR GENERAL LOCATION ONLY AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

LEGEND	
△	AMBIENT AIR SAMPLE LOCATION
⊗	SSDS PICKUP POINT LOCATION
	SSDS: SUB-SLAB DEPRESSURIZATION SYTEM

Project Mngr:	TPW	Project No.	58107058
Drawn By:	JLM (41)	Scale:	NOT TO SCALE
Checked By:	DMB	File No.	58107058AC1R1
Approved By:	TPW	Date:	3/2018

Terracon
 Consulting Engineers and Scientists
 9856 SOUTH 57th STREET FRANKLIN, WI 53132
 PH. (414) 423-0255 FAX. (414) 423-0566

SUB-SLAB DEPRESSURIZATION SYSTEM & AMBIENT AIR SAMPLING LOCATIONS - 1033 BUILDING	
CLARE CENTRAL APARTMENTS 1033 WEST ATKINSON AVENUE MILWAUKEE WISCONSIN	