HEDRA Memorandum

To: **HEDRA Commissioners**
From: **John Hinzman, Community Development Director**
Date: **August 19, 2019**
Item: **Authorize Signature of Contract - VIMS - Clean Vapor**
Authorize Release of Bid Specifications - Hudson Wood Encapsulation

Action Requested:

Take the following actions related to transfer of the former Hudson Manufacturing Building to Confluence Development:

1) **Authorize Signature of a contract with Clean Vapor to install a Vapor Intrusion Mitigation System (VIMS).** The project was publicly bid in 2017. HEDRA awarded the contract to Clean Vapor on August 10, 2017.

2) **Authorize Release of Wood Encapsulation Bid Specifications**. Bids would be due in September. HEDRA would award the project by the end of September and work would begin shortly after.

Environmental Obligations

As previously agreed, the City and HEDRA have committed to completing certain environmental remediation of the site after the transfer of the property. Grant funds cover a substantial portion of the project, however HEDRA funds would be used to fill gaps.

- **Vapor Intrusion Mitigation System (VIMS)** - A system to actively vent soil vapor. Floors of the building would be sealed and connected with pipes and blowers to vent off soil vapor. Includes Supplemental VIMS Work for the removal of floor trusses and additional rock to provide a level floor in crawl space areas.

- **Wood Sealing and Encapsulation** - Environmentally contaminated wood floors and trusses would be cleaned and sealed with a specialized paint or gypcrete.

	Total Estimated Cost	Available Grant Funding	Net City Cost
VIMS	*$813,714	$500,000	*$313,714
Wood Sealing	$150,460	$78,000	$72,460
TOTAL Cost	$964,174	$578,000	$386,174

* Represents a cost increase of $21,114 over 2017 estimate

Attachments:

- VIMS Bid Amount and Plans
- Wood Sealing and Encapsulation Bid Specs

REVISED QUOTE – 7-19-19

BID RESPONSE FORM

Former H.D. Hudson Manufacturing Facility
200 West 2nd Street
Hastings, Minnesota

BASEMENT BID

Item No.	Item	Unit	Quantity	Price
1	Mobilization/Demobilization	LS	1	$ 26,500.00
2	Furnish and Install Vapor Intrusion Mitigation System for the Basement Slab Areas (Sections C, D, F and G) per the revised Plan dated December 18, 2017, *Vapor Intrusion Mitigation Plan Design* Report. Post-Installation System Performance and Post-Installation System Effectiveness Shall Meet All Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH) Vapor Intrusion Mitigation System Criteria.	LS	1	$ 179,034.00

Bid $ 204,534.00

CRAWLSPACE OPTION A BID

Item No.	Item	Unit	Quantity	Price
1	Mobilization/Demobilization	LS	1	$ 38,160.00
2	Furnish and Install Vapor Intrusion Mitigation System for the Crawlspace Areas (Sections A, B and E) per the revised Plan dated December 18, 2017, *Vapor Intrusion Mitigation Plan Design*. Post-Installation System Performance and Post-Installation System Effectiveness Shall Meet All MPCA and MDH Vapor Intrusion Mitigation System Criteria. All crushed stone, DGA and concrete to be supplied by others. Trenching of stone for the installation of PVC pipe to be supplied by others.	LS	1	$ 182,320.00

Bid $ 220,480.00

CRAWLSPACE OPTION B BID

Item No.	Item	Unit	Quantity	Price
1	Mobilization/Demobilization	LS	1	N/A
2	Furnish and Install Vapor Intrusion Mitigation System for the Crawlspace Areas (Sections A, B and E). Design, Post-Installation System Performance & Post-Installation System Effectiveness Shall Meet All MPCA & MDH Vapor Intrusion Mitigation System Criteria.	LS	1	N/A

Bid Not Bidding

Bidder Name Clean Vapor, Inc. Business Address 148 Route 94, PO Box 688

Signed by Thomas E. Hatton Blairstown, NJ 07825

Title CEO-Project Director Telephone No. 908-362-5616

Email THatton@CleanVapor.com Fax No. 908-362-5644

If you have questions, contact:

Owner Representative:
John Hinzman (Hastings Economic Development and Redevelopment Authority) @ 651-480-2378
JHinzman@hastingsmn.gov

Engineer Representative:
David Constant (Stantec) @ 651-255-3960
David.Constant@stantec.com

REFERENCES

Contractor shall provide a list of three (3) vapor intrusion mitigation system installations within the last three (3) years. At least two (2) projects must have a project cost greater than $200,000.

Vapor Intrusion Mitigation System Project No.1

Project Name and Location	Ponce City Market, Atlanta, Georgia
Dates for Project	9/2013-11/2016
Scope of Work	See Attachment
Final Project Cost	$ 389,000.00
Project Contact	Jeff Margolin, Principal
Contact Telephone Number	678-388-1641
Contact Email	JMargolin@ramboll.com

Vapor Intrusion Mitigation System Project No.2

Project Name and Location	Univar Site, Wendover Ave, Greensboro, NC
Dates for Project	9/2016-Current
Scope of Work	See Attachment
Final Project Cost	$ 359,300.00
Project Contact	See Attachment
Contact Telephone Number	See Attachment
Contact Email	See Attachment

Vapor Intrusion Mitigation System Project No.3

Project Name and Location	Former Energizer Facility, St. Albans, Vermont
Dates for Project	12/2014-5/2015
Scope of Work	See Attachment
Final Project Cost	$ 186,838.00
Project Contact	Catherine Regan, Senior Engineer (On Short Term Leave)
Contact Telephone Number	617-997-2208
Contact Email	Catherine.Regan@erm.com
Second Contact	Nadine Weinberg, Partner
Contact Email	Nadine.Weinberg@erm.com

Vapor Intrusion Mitigation System Project No. 4

Project Name and Location	Solvay Solexis, Thorofare, New Jersey
Dates for Project	8/2011-10/2012
Scope of Work	See Attachment
Final Project Cost	$ 377,260.00
Project Contact	Mitch Gertz, HSE Compliance Manager
Contact Telephone Number	856-853-8119
Contact Email	Mitchell.Gertz@Solvay.com

VAPOR INTRUSION MITIGATION PLAN DESIGN
for:
Former H.D. Hudson Manufacturing Facility
200 W. 2nd Street, Hastings, Minnesota

Prepared for:

Mr. David Constant, P.G.
Team Leader
Stantec
2335 Highway 36 West
St. Paul, MN 55113

Prepared by:

Mr. Thomas Hatton
CEO - Project Director
NRPP #104705
Clean Vapor, LLC
148 Route 94
P.O Box 688
Blairstown, New Jersey 07825

September 2, 2016
Rev 1 March 20, 2017
Rev 2 December 18, 2017
Rev 3 August 12, 2019

Table of Contents

Front of Building of Concern

1.0 Introduction

1.1 Background

Clean Vapor, LLC (Clean Vapor) was retained by the City of Hastings, Minnesota to conduct a building investigation, diagnostic test, and prepare a vapor intrusion mitigation system (VIMS) design for the Former H.D. Hudson Manufacturing Facility located at 200 West 2nd Street in Hastings, Minnesota. The building is a three story masonry and wood structure that was originally constructed in the late 1800's and over the years has undergone multiple additions. During that time, the building was used for the manufacturing of metal agricultural spraying equipment. It is now scheduled to be redeveloped as retail and residential space. The buildings sub structure can be essentially divided into four main basement sections and three separate crawlspaces. Above the crawlspaces are damaged wood plank floors that are still in place from when the building was used as a factory. This planking is scheduled to be removed so the crawlspaces may be accessed for soil removal which is part of the environmental remediation. The figure below outlines those building sections; the numbering system shown will be used throughout the report.

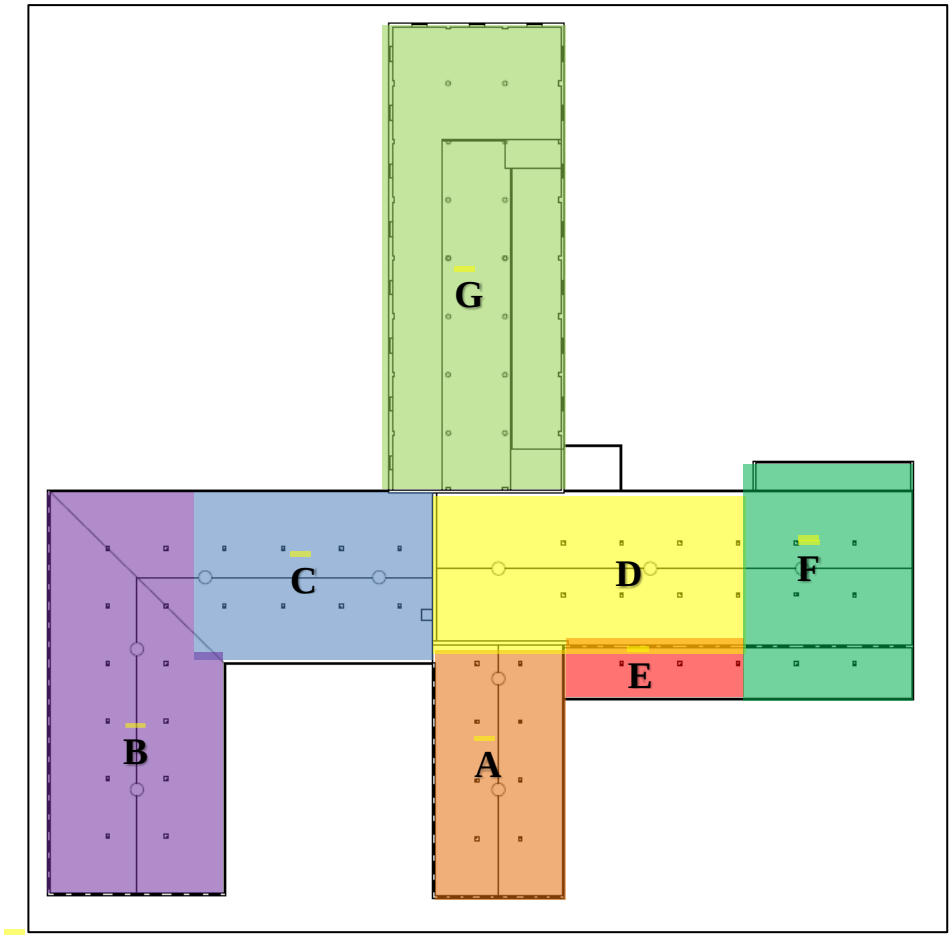

Figure 1 Building Sections Identified

The proposed VIMS has been designed to create a negative pressure field (relative to typical building pressures at the time of diagnostic testing) under the slab of the building, so that sub slab vapors in these areas will be unlikely to migrate upwards into the building. Clean Vapor's design consists of specifications and drawings that provide details for construction of a Sub Slab Depressurization System (SSDS). If installed, operated and maintained per specifications, the SSDS will be able to maintain negative sub slab pressures under reasonably anticipated conditions and prevent soil borne vapors from entering into the building. The goal of the system is to create a sub slab negative pressure field with a minimum vacuum field of -0.004 inches of water column ("w.c.). The industry accepted standard of 0.004 "w.c. as proposed by Sundquist and Wertz[1], will be used as a target level of depressurization.

Because the final state of the HVAC system is currently unknown, the system has been designed conservatively to take into account HVAC changes; however, if substantial changes are made to the building or its HVAC system after the SSDS installation, pressure tests should be conducted by experienced vapor intrusion mitigation professionals to ensure that negative pressures are still being maintained below the slab under the new conditions. The diagnostic procedures and mitigation remedies specified in this document comport with the Minnesota Pollution Control Agency Vapor Intrusion Technical Document, August 2010.

The information in this report including text, photographs and diagrams shall be considered to be the intellectual property of Clean Vapor, LLC and is intended to facilitate the vapor intrusion mitigation of 200 West 2nd Street, Hastings, Minnesota. Any reproduction of the content of this report in part or total for any other purpose is prohibited without the written consent of Clean Vapor, LLC.

1.2 Building Sections

Building Section A and the north third of the Section D basement are the oldest and original sections of the building. The basement section was constructed in 1913 and the crawlspace, Section A was constructed in 1914. The crawlspace has exposed soil and is divided into three spaces by brick support walls that run east to west the full length of the crawlspace. The brick walls provide a carrying structurer for the floor jousts that run north to south. Sections B and C were constructed in 1921. Section B is a crawlspace that also has exposed soil and is divided into three spaces by brick support walls that run east to west the full length of the crawlspace. There are also concrete machine pads that arise from the underlying soil to a top elevation that is flush with the level of the weed floor. The Section C basement has a concrete floor that was poured over uncompacted indigenous soils. The southwest corner of this basement section has a slab area that is approximately two feet lower than the rest of the basement. This space has what

[1]Sundquist, Jon A. Ph.D., Wertz, William E. PhD, Boyd, John H., September 2007, AWMA Symposium, Providence, RI. Sub Slab Depressurization System Performance Evaluation

appears to be remnants of a large chimney foundation and was nearly full of standing water at the time of our visit. The southern two-thirds of Section D was constructed in 1921. The sub slab material is also uncompacted indigenous soils with loose sandy clay and some small stones. Section E is a rectangular crawlspace that runs north to south and appears to have been constructed at the time of the 1921 addition. Section F was constructed in 1927. The sub slab material consisted of moderately compacted native soils. Section G is an addition that was constructed in 1946 and the sub slab material is sand and small stones. There is also a cut out in the floor for a Toledo Scale.

2.0 Diagnostics

2.1 Diagnostic Procedures

In accordance with the accepted design proposal and plan for diagnostics dated October 16, 2015, a building investigation and diagnostic testing was performed on February 10-12, 2016. A total of four (4) 2 5/8 inch diagnostic suction hole transects were drilled throughout the building. A calibrated shop vacuum was used to apply vacuum to the sub slab material to simulate vacuum fields. Smaller test holes were drilled through the slabs within the suction holes' radii of influence. The motor speed of the vacuum was varied to develop a performance curve that would enable us to project the airflow characteristics of different blowers. Static vacuum and airflow measurements were conducted at the suction holes. A micro-manometer was used to measure pressure differentials at the remote test holes. A vane anemometer was used to measure airflow that was yielded from the sub slab. The acquired data has been interpolated to make reasonable assumptions to predict pressure field extension and airflow. Prior to conducting vacuum field testing, base line pressure differential measurements were recorded. The average base line pressure differential was approximately +0.006″ w.c. indicating a significant negative pressure inside the building relative to the underlying soil. The outdoor temperature during the time while diagnostic testing was conducted ranged between 7 to 12 degrees Fahrenheit and the indoor temperature was approximately 55 degrees indicating a temperature differential of approximately 40 degrees F. The average pressure differential of +0.006 that was measured at this building is approximately four times what is normally observed when there is a 40 degree indoor to outdoor temperature differential. The winds were calm and relatively nonexistent while the baseline pressure field data was being collected so wind was not a contributing factor to the large pressure differentials.

Temperature differentials are the single largest driving factor that contributes to vapor intrusion. Depending on the profile and geometry of the building, wind and barometric pressure differentials are usually distant second or third place influencing factors. The angular structure of this building where there are large additions that are perpendicular to the main structure and high peaked roofs contribute to the building being easily influenced by wind induced pressure differentials. These features combined with the climate zone temperature differentials that are inherent to Minnesota where there can be 80 to 90 degrees or more temperature differentials

from summer to winter make this building a good candidate for the integration of pressure stabilizing dynamic controls. These controls will provide significant energy savings while extending the life of the motors because they will only be operating at maximum speeds during the coldest times of the year.

The results of diagnostic testing are shown in the Diagnostic Data Section of this report. Pictures of the diagnostics being performed can also be seen in the Pictures section and relevant points from diagnostics are shown on a drawing in the attached drawings.

2.2 *Diagnostic Data*

Test hole locations can be found in the attached drawings. All distances are in feet and vacuum measurements in inches of water column.

2.2.1 Building Section G, Test Suction Point #1

Vacuum Applied ("wc):		Baseline	10	5	2.5
Airflow (cfm):		-	115	76	51
Test Hole #	**Distance (ft.)**	**Pressure field extension table begins below this line**			
V-1	1	0.0088	-2.07	-1.20	-0.67
V-2	5	0.0102	-0.9520	-0.5480	-0.3210
T-1	10	0.0136	-0.5180	-0.3020	-0.2030
T-2	20	0.0151	-0.4100	-0.2340	-0.1548
T-3	30	0.0348	-0.3010	-0.0031	0.0116
T-4	40	0.0317	0.0119	0.0139	0.0138
T-5	50	0.0391	0.0332	0.0332	0.0382
T-6	10	0.0134	-0.8020	-0.4550	-0.2950
T-7	20	0.0096	-0.3440	-0.1956	-0.1278
T-8	25	0.0060	-0.1949	-0.1144	-0.0739
T-9	10	0.0105	-0.8670	-0.5010	-0.3020
T-10	20	0.0060	-0.2740	-0.1708	-0.0974
T-11	30	0.0040	-0.0764	-0.0466	-0.0255
T-12	40	0.0035	-0.0435	-0.0257	-0.0136
T-13	10	0.0099	-0.3730	-0.2200	-0.1202
T-14	20	0.0141	-0.1771	-0.1017	-0.0559
T-15	25	0.0134	-0.1228	-0.0668	-0.0324
T-16	50	0.0001	-0.0165	-0.0095	-0.0050

Average Baseline pressure differential 0.0135″ w.c.

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2.2.2 Building Section C, Test Suction Point #2

Vacuum Applied ("wc):		Baseline	5.0	2.5
Airflow (cfm):		-	128	90
Test Hole #	**Distance (ft.)**	**Pressure field extension table begins below this line**		
V-3	1	0.0018	-0.53	-0.2980
V-4	5	0. 0020	-0.4720	-0.2640
T-17	10	0.0023	-0.4693	-0.2580
T-18	20	0.0024	-0.3780	-0.2046
T-19	25	0.0028	-0.3636	-0.1964
T-20	10	0.0043	-0.4660	-0.2560
T-21	20	0.0045	-0.4516	-0.2477
T-22	30	0.0021	-0.4370	-0.2409
T-23	8	0.0023	-0.4670	-0.2630
T-24	10	0.0017	-0.0045	-0.0025
T-25	20	0.0009	-0.0050	-0.0029
T-26	25	0.0011	-0.0053	-0.0029
T-27	10	0.0000	-0.4416	-0.1113
T-28	20	0.0025	-0.3650	-0.2096
T-29	30	0.0006	-0.0951	-0.0700
T-30	40	0.0033	-0.1174	-0.0654
T-31	36	0.0038	-0.2914	-0.1668
T-32	36	0.0046	-0.1886	-0.1071
T-33	36	0.0024	-0.3829	-0.2250
T-34	32	0.0023	-0.4199	-0.2477

Average Baseline pressure differential 0.0023″ w.c.

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2.2.3 Building Section D, Test Suction Point #3

Vacuum Applied ("wc):		Baseline	24.8	10	5
Airflow (cfm):		-	72	48	30
Test Hole #	**Distance (ft.)**	**Pressure field extension table begins below this line**			
V-5	1	0.0027	-13.45	-5.9	-3.67
V-6	5	0.0001	-9.70	-4.29	-2.63
T-35	10	0.0003	-9.40	-4.19	-2.56
T-36	20	0.0003	-0.9470	-0.68	-0.1560
T-37	Not Used				
T-38	10	0.0003	-0.3370	-0.1653	-0.1187
T-39	20	0.0033	-0.7728	-0.3360	-0.2190
T-40	30	0.0051	-0.0542	-0.0274	-0.0160
T-41	40	0.0072	0.0000	0.0000	0.0000
T-42	10	0.0001	-9.00	-4.60	-2.53
T-43	20	0.0012	-0.5003	-0.2861	-0.1754
T-44	27	0.0011	-0.3661	-0.2155	-0.1324
T-45	10	0.0006	-8.95	-4.45	-2.23
T-46	20	0.0014	-1.22	-0.6227	-0.3250
T-47	29	0.0007	-0.0700	-0.0531	-0.2800

Average Baseline pressure differential 0.0017″ w.c.

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2.2.4 Building Section F, Test Suction Point #4

Vacuum Applied ("wc):		Baseline	19.7	10	5
Airflow (cfm):		-	92	64	43
Test Hole #	**Distance (ft.)**	**Pressure field extension table begins below this line**			
V-7	1	-0.0080	-4.06	-2.20	-1.23
V-8	5	-0.0090	-1.1900	-0.6690	-0.3600
T-48	10	0.0100	-0.5500	-0.3300	-0.1834
T-49	20	0.0110	-0.3860	-0.2330	-0.1334
T-50	30	0.0115	-0.3210	-0.1930	-0.1105
T-51	35	0.0120	-0.2970	-0.1768	-0.1000
T-52	10	0.0080	-0.6640	-0.4000	-0.2160
T-53	20	0.0070	-0.1922	-0.1148	-0.0617
T-54	29	0.0075	-0.1805	-0.1090	-0.0588
T-55	10	0.0082	-1.0500	-0.6380	-0.3410
T-56	20	0.0087	-0.5900	-0.3600	-0.1941
T-57	30	0.0075	-0.1395	-0.0815	-0.0425
T-58	40	0.0070	-0.1330	-0.0780	-0.0407
T-59	44	0.0063	-0.1068	-0.0650	-0.3170
T-60	10	0.0097	-0.6020	-0.3530	-0.1975
T-61	20	0.0095	-0.3620	-0.2200	-0.1191
T-62	30	0.0090	-0.2240	-0.1305	-0.0690
T-63	40	0.0080	-0.1578	-0.0911	-0.0461
T-64	50	0.0077	-0.0800	-0.0450	-0.0220
T-40	60	0.0072	-0.0200	-0.0104	-0.0020
T-41	70	0.0001	-0.0040	-0.0006	0.0000

Average Baseline pressure differential 0.0066″ w.c.

2.3 Interpretation of Diagnostics

Pressure fields were determined by evaluating the results of the pressure field testing. The overall vacuum field extension testing provided data that could be used to develop a model capable of projecting the negative pressure field that will prevent the upward migration of soil gases into the occupied space.

Based on the tables in Section 2, radii of influence ranged from 20 to 50 feet throughout the building sections. Overall, the vacuum field extensions were greater than 40 feet. There were only a few areas where the vacuum field was truncated by sub slab obstructions. Suction point locations were based on these observed radii of influence.

Measurements of the indoor air pressure relative to the outdoor air indicated that under current building conditions, the building is under a negative load. This indicates that unless active sub slab vacuum is applied to overcome this building pressure, vapor intrusion will continue to occur.

2.4 Blower Selection and Suction Point Locations

There will be five (5) mitigation blowers installed on the roof of the building. The locations of the blowers are indicated on the attached drawings and a typical photo example can be seen in the Pictures section. Blowers and suction points have been selected and specified based on the volume of air yield and static pressure readings recorded from the diagnostics testing. The design objective is to create a negative pressure field with a minimum performance of -0.004" w.c. at the outer extent of the negative pressure field. When soil is removed from the suction point, solution channels that were not detected during the diagnostic phase are sometimes discovered. This can result in greater than expected airflow and decreased static vacuum. It cannot be projected if or when this may occur but when it does, it is considered to be good because it can allow the consultant the opportunity to specify a lower vacuum and horsepower blower which results in the motor operating at greater efficiency and under less load.

After the suction points have been developed, they shall be individually tested using a vapor blower or calibrated vacuum to simulate the vacuum to be applied by the permanent blower. This should be done before the permanent blower is mounted to the stand for final activation. Static vacuum, airflow and the pressure differential at a temporary floor port shall be measured. The temporary floor port should be located at the projected outer extent of the negative pressure field. Most of these ports will be mid-way between a suction point that is located on the next column line up and over. A data set shall be attained at maximum motor speed. The motor speed should then be reduced until the distant test port measures -0.008" w.c. The second set of static vacuum and air flow measurements shall be recorded. The temporary ports shall be numbered on the suction point drawing. This data shall be logged in table format and retained. Once the suction point performance of all of the suction points within an individual system has been measured and the extension of the negative pressure field verified, the data should be evaluated to confirm that the blower that was specified matches the static vacuum and airflow yield potential of the total system. When evaluating the potential soil gas yields from the crawlspace systems, pressure differentials shall be measured from the embedded probes that are most distant from the sub linear suction points. This procedure and the interpretation of the data should be done by a person who is experienced and skilled in the art of evaluating suction point data and selecting blowers for optimal performance and energy efficiency. If the system is yielding a greater or less than anticipated volume of soil gas, the blower shall be changed to a blower in an appropriate performance range. Once an individual system’s performance has been verified the manufacturer shall be directed to ship the properly sized blower.

The blowers for Systems 1 through 5 will be mounted on the flat section of the roof. The systems' common riser pipe will penetrate the third story roof and run to the roof mounted blowers.

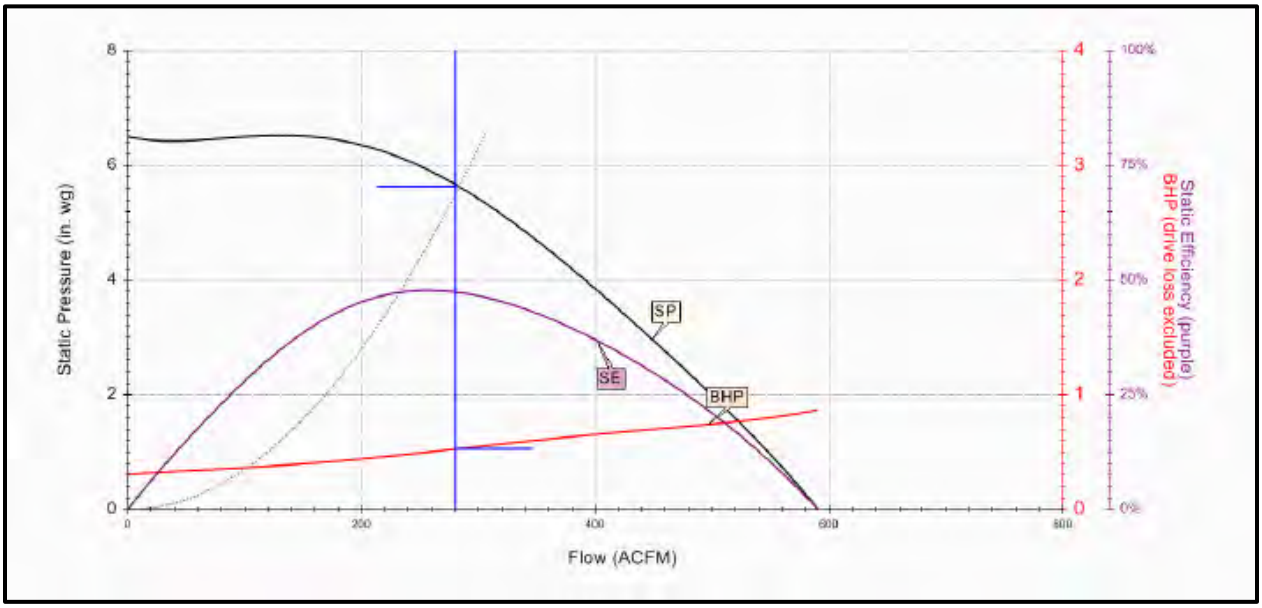
The roof mounted blowers will be located directly above, or as close as possible, to roof trusses and support columns. The location and blower type is noted by a symbol in the System Drawing. The blower exhaust will be a minimum of two feet above the roofline. The blower exhaust will be a minimum of twenty feet from windows, doors, air intakes, passive relief vents or any other openings in the building that cannot be easily repaired. The final location of each blower will be field verified by the owner and the architect responsible for the project.

An examination of the soil matrix, sub slab permeability mapping data, and experience factors are all considered when developing these projections. The following graphs show the blower curves for the fan types to be installed at the site. When systems are dynamically controlled, the blower curve will change based on applied power to the motor.

2.5 Cincinnati Fan PB-9

Cincinnati Fan Model PB-9 @3,450 RPM 0.75 Horse Power

Rating Point: 5.5″ w.c. @ 280 CFM



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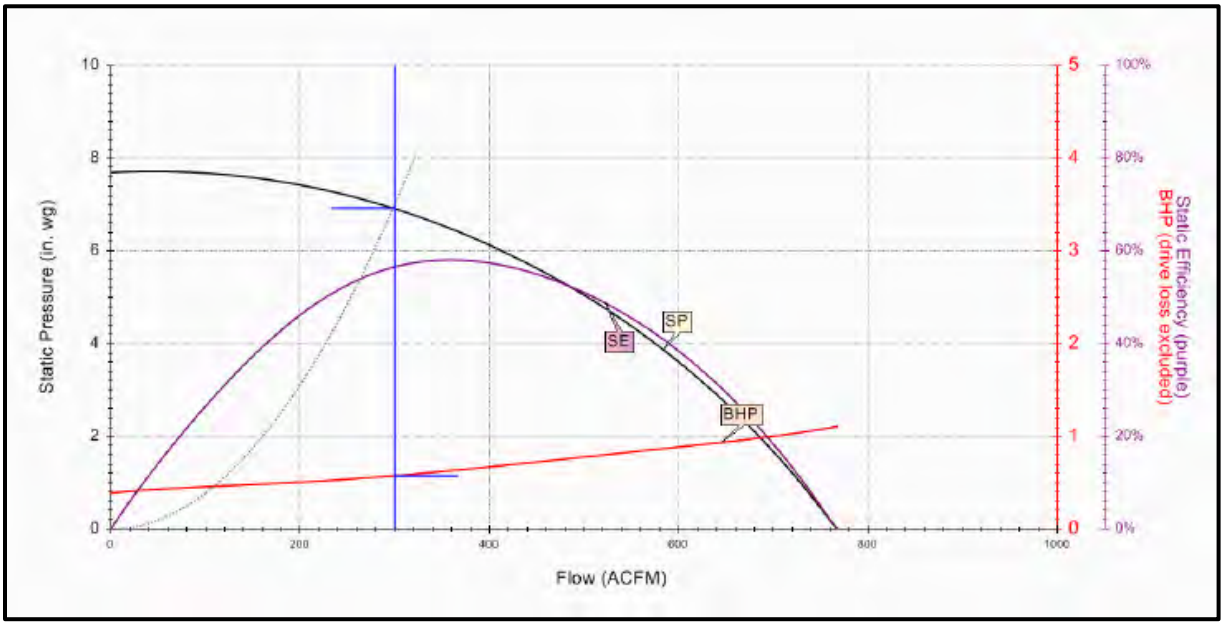
2.6 Cincinnati Fan PB-10A

Cincinnati Fan Model PB-10A @3,450 RPM 0.75 Horse Power

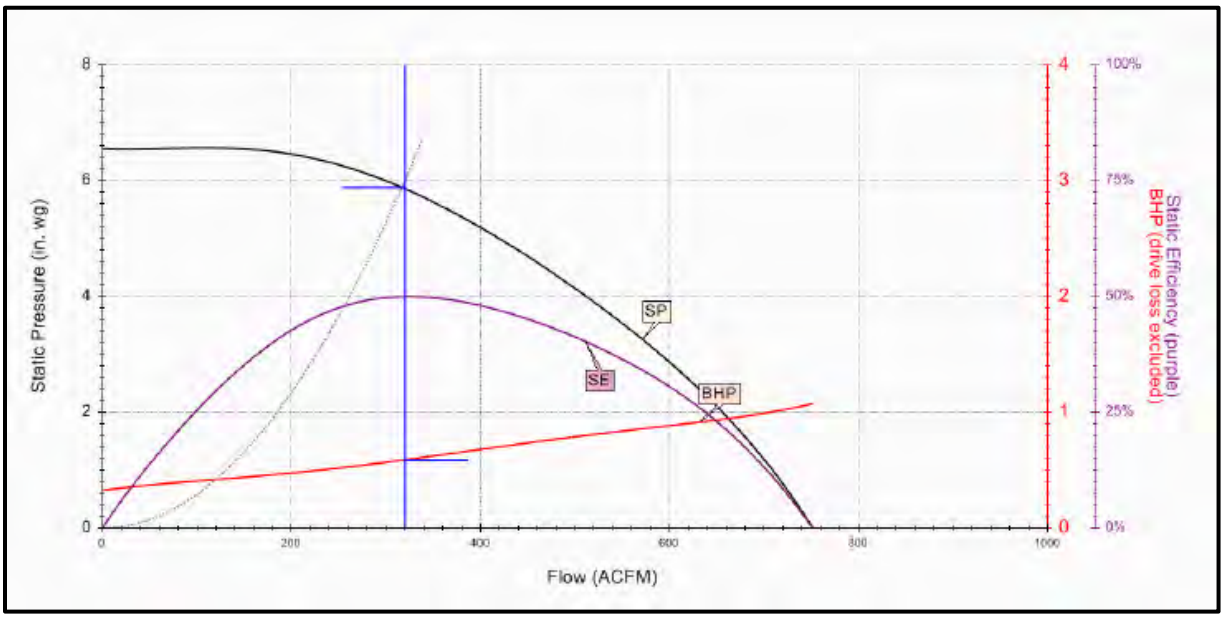
Rating Point: 7.0″ w.c. @ 300 CFM



2.7 Cincinnati Fan PB-10A

Cincinnati Fan Model PB-10A @3,450 RPM 0.75 Horse Power

Rating Point: 6.0″ w.c. @ 320 CFM



3.0 System Design and Installation

3.1 System Layout

Each of the seven targeted building sections will have independent systems. Basement Sections A and E and Crawlspace Sections D and F each being serviced by a single blower. The table below displays the targeted applied vacuum and projected soil airflow yields to meet minimum pressure differential requirements.

Blower System #	Section #	Fan Model	Applied Vacuum ("w.c.)	Projected Airflow (cfm)	# of Suction Points
1	G	Cincinnati Fan Model PB-10A	7.0	300	4
2	B	Cincinnati Fan Model PB-9	5.5	280	3
3	C	Cincinnati Fan Model PB-10A	6.0	320	3
4	A, E	Cincinnati Fan Model PB-9	5.5	280	4
5	D, F	Cincinnati Fan Model PB-10A	7.0	300	5

3.2 Suction Holes

A total of twenty (20) suction points will be installed. Twelve (13) of the suction points will be conventional sub slab suction points that draw soil gases from cavities below the slab and seven (7) of the suction points will be sub liner suction points that draw soil gases from a collection plenum that is below a sealed spray applied vapor barrier. See Drawing Sheet 3 for the locations of suction points, mitigation piping and blower locations. To enhance the vacuum field distribution and limit any disruption to building use, the suction points will be located near permanent walls or existing support columns. The specific location of the suction holes shall be agreed upon by Clean Vapor and the building owner's representative prior to installation. When drilling suction holes, the procedures listed in the General Installation section shall be followed to minimize damaging any sub slab utilities.

Approximately 1.5 cubic feet of soil will be removed from each suction point. *Clean Vapor is not responsible for sub slab fill testing and disposal, it is estimated that, five (5) 55 gallon drums will be required. For the best cost efficiency excavated sub slab soils should be disposed with the soil that is removed from the crawlspaces.*

3.3 System Piping

All horizontal pipe runs between the fans and the first suction hole will be installed with one inch slope back to a suction hole for each ten feet of horizontal pipe run. All vertical pipe runs will be installed plumb. All horizontal runs after the first suction hole may be run level. However, in no case will the piping be installed so as to create a possible water trap in the piping. All piping and fittings installed, unless otherwise noted or specified, shall be Schedule 40 PVC pipe.

The PVC pipe will be supported at least every six feet of horizontal run and at least every ten feet of vertical run. All horizontal pipe runs will have a support with an appropriate device

within two feet of each fitting and a maximum distance between supports of eight feet as per the National Plumbing Code. Conduit channel with pipe clamps can also be used to support pipe routed along the ceiling or walls. Pipe cannot be supported by other building piping or ducts. Swivel ring or standard bolt-type clevis will be used to support pipe

There may be a need to balance airflow and equalize the distribution vacuum throughout the systems. Inline gate valves shall be installed in each suction point riser pipe for all systems. The slide ring clamp should be fixed in place with silicone caulk after the system has been balanced.

3.4 Blower Installation and Start Up

There will be five (5) roof mounted blowers installed. The locations of the blowers are indicated on the attached drawings and typical photo examples can be seen in the Pictures section. Blowers were specified based on diagnostic vacuum distribution and airflow measurements as discussed earlier. When soil is removed from the suction point, solution channels that were not detected during the diagnostic phase are sometimes discovered. This can result in greater than expected airflow and decreased static vacuum. After the suction points have been developed they shall be individually tested using a vapor blower or calibrated vacuum to confirm the vacuum to be applied by the permanent blower. This should be done before the permanent blower is mounted to the stand for final activation. If an individual system is yielding a greater or less than anticipated volume of soil gas, the blower shall be changed to a blower in an appropriate performance range.

The roof mounted blowers will be located directly above, or as close as possible to; roof trusses, support columns, or existing engineered curbs. The location and blower type is noted by a symbol in the System Drawing. The blower exhaust will be a minimum of two feet above the roofline. The blower exhaust will be a minimum of twenty feet from windows, doors, air intakes and passive relief vents. The final location of each blower will be field verified by Clean Vapor prior to installation.

3.5 Roof Penetrations

All roof penetrations must be coordinated with the owner's representative prior to performing the work. Clean Vapor will penetrate the roof and provide final roof sealing.

3.6 Sealing

3.6.1 Cracks and Joints

Any visible expansion joints or slab cracks in the areas being mitigated that have a 1/16 inch or greater opening will be sealed. Cracks will be cleaned with a walk behind rotary wheel device with a vacuum attachment to capture dust or debris. Cracks that are from concrete faults and identified expansion joints will be channel key cut prior to sealing using a crack saw fitted with a dust collecting device. Cracks will be sealed with a gun-grade urethane caulk sealant. Any

openings into the slab, such as those that may occur around conduit pipe penetrations through the slab, will be cleaned and sealed with gun-grade urethane caulk. Expansion joints that are greater than ¼ inch in width or greater than 3/8 inch below the floor surface may require the installation of backer rod and self-leveling urethane sealant. There are several large floor fissures in Building Section G as well as an abundance of perimeter floor wall joints and expansion joints that require sealing. 4th

3.7 Area G Floor Scale

There is also a large Teledo Scale embedded into the floor in Section G. The base of the vault that houses the scale was not available for inspection at the time of our visit. As part of the fit out, this scale should be removed and the vault inspected for cracks and any that are observed sealed. It is also recommended if the scale is not going to be kept for it's historical value then the scale shall be removed and the space backfilled with crushed stone and a new slab poured flush with the level of the existing floor. In Sections D and F almost all of the expansion joints will require preparation and sealing.

3.8 Blower Wiring

A dedicated breaker should be used for the mitigation blowers. This will prevent the blowers from being shut off when a circuit is powered down for an unrelated function. Based on the blower amperage requirements, an electrician will determine the load for each circuit. The panel location and breaker number will be referenced in the final report and on the system labels. The electric will be pulled from the nearest available panel or other panel as identified by the building owner. Accommodating the power requirements of the specified blowers shall be integrated into the overall building rehabilitation plan.

The electrical contractor will be responsible for providing conduit, wiring and electrical power to the blowers. When wiring outdoor blowers, the electrical contractor will use outdoor rated flexible conduit from each switch box to the blower. Wiring from the switch box to the blower will be approved individual 12 gauge wire. Outdoor rated switch boxes will be attached to the blower housing.

3.9 Variable Frequency Drives

The radial blowers to be installed will be equipped with Variable Frequency Drives (VFD). The installation of a VFD allows us to tune the radial blower's performance to apply the most effective and efficient vacuum to the suction points in the system. The VFDs also allow for an incremental and even distribution of voltage during start up or in the event of a power outage. The VFD will be integrated into the dynamic control and management system and, through a control logic system, will actively manage the speed of the blowers to ensure that the specified vacuum fields are maintained. The management system also for provides for onsite and offsite blower control.

3.10 Vacuum Indicators

Magnehelics will be installed to indicate the static vacuum generated by each system. To the extent practicable, the range of the Magnehelics will be selected so that the indicator needle is close to or just to the right of center on the dial face. The Magnehelics shall be enclosed in a protective enclosure. The low pressure Magnehelic ports will be connected with 1/4" O.D. rigid polyethylene tubing to the interior air stream of one riser pipe of each blower system. The polyethylene tubing should arc to a higher elevation than where it exits the riser pipe before it is connected with the Magnehelic. This will prevent condensation from running into the Magnehelic or creating a water trap in the tube. Exposed sections of tubing below drop ceilings and longer than four inches will be enclosed in rigid conduit. It is recommended that the Magnehelic panel be located in Section G near where the piping turns up to travel through the above floors. The exact location of the Magnehelics is at the discretion of Clean Vapor, with input from the owner's representative, and should be noted in the final system As Built drawings.

3.11 Fire Stopping

PVC pipes that penetrate fire-rated walls or ceilings shall be protected using intumescent fire collars and fire-rated caulk. Hilti is the recommended manufacturer of fire stopping products.

3.12 Sampling Ports

Test ports for manually measuring vacuum and airflow shall be installed in each of the riser pipes at the 60 inch elevation. Ports should be on the right side of the pipe when viewed straight on when possible. They shall be drilled, taped and plugged using a 3/8-16 x ¾ stainless steel socket cap screw with a neoprene washer. Soil gas samples may also be collected from these ports. Permanent sub slab test ports will be installed at various locations throughout the building for the purpose of measuring sub slab vacuum. The location of these ports will be discussed prior to installation and shall be shown on the As Built drawings. Two (2) to six (6) ports will be installed per system; the port can be accessed via a flush mounted 3/4 inch cap head bolt.

3.13 System Labeling

A label will be installed at the disconnect switch next to the fan that says "Active Soil Depressurization System, Do Not Alter." The electrical circuit at the panel that is used to control the fan will be labeled as "Active Soil Depressurization System". At least every 20 feet of exposed contaminant vent pipe length will have a label that reads "Active Soil Depressurization System" attached to the pipe. All labels shall be readable from three feet away.

4.0 Special Tasks

4.1.1 Sealing and Depressurizing the Crawlspaces

Building Sections A, B and E are constructed over crawlspaces that will require sealing and depressurization. A crushed stone, perforated pipe and spray applied vapor barrier venting system has been designed for the relief of these contaminants. As part of the remedial effort, soil from these areas has been removed using vactor trucks. The space between the crawlspace soil and the vapor barrier is scheduled to be filled with # 57 stone that will provide permeable bedding for the collection system and other utility piping associated with the fit out. The stone gravel bed shall be AASHTO #57 the American Association of State Highway and Transportation Officials grading system for stone that requires 87 percent of the stone to pass through a 3/4" sieve, 25-60 percent must pass through ½" sieve and 0-10 percent must pass through a No. 4 sieve.

The crawlspaces are longitudinally segmented by brick foundation walls into areas that are approximately 20 feet wide. Twenty feet long 3 x 12 floor joists that are twelve inches on center, span the distance between the brick wall joist support. In some areas, there are concrete machine pads that are set in the ground with tops that are flush with the level of the existing floor. It is planned for the wood joists to be removed by the renovation contractor. All exposed crawlspace soils shall be covered with Mirafi 500X geotextile fabric before installing the crushed stone layer.

A contiguous bed of #57 stone shall be installed to within twelve inches of finished floor elevation. Four-inch perforated PVC pipe shall be embedded in the top twelve inches of the stone layer to facilitate a conveyance plenum that will run the full length of each crawlspace section. The top of lateral perforated PVC pipe shall be two to four inches below the vapor barrier. Maintaining a contiguous pipe and stone bed that forms a collection plenum the entire length of each crawlspace segment is critical to the function of the system. Individual gate valves shall be installed in the basement at the point where the collection pipes exit the crawlspace. Once in the basement, each of the crawlspace riser pipes shall be joined to a common conveyance pipe that is connected to a roof mounted blower. Sub grade plumbing discharge pipes will also be installed in the stone.

4.1.2 Water Relief

Simultaneous to the installation of the crushed stone, a perforated 3-inch Schedule 40 water relief and drainage pipe shall be installed against the down slope wall of each crawlspace section. The pipe shall rest in a bed of crushed stone above the filter fabric or on top of a one-foot wide piece of Geovent®. The purpose of the Geovent® is to create a space between the drainage pipe and the ground where fine soil particles can accumulate without blocking the inflow of water

into the pipe. In Crawlspace Section B, the dedicated drainage pipes will need to penetrate the base of two of the longitudinal walls and terminate in the open basement space C. A ball valve will be located in the basement where the pipe exits the common wall. In Crawlspace Sections A and E, the individual drainage outflow pipes will exit the common wall of each crawlspace section into the basement. Each individual pipe will be equipped with a manual ball valve. Down gradient of the ball valves from each of the four crawlspace water relief valves, the drainage pipes can be joined to a common water drainage pipe. Since it is not possible to determine if water will accumulate within the vapor collection system, the water relief component has been designed with manual valves to drain off accumulated water. In the future, if it is determined that water accumulation is an inherent occurrence, sensors and electronically actuated valves can be integrated for automated water relief. Closed sump basins or other mechanisms for discharging water can be also be integrated if excess groundwater becomes a problem. It is likely that the water vapor will be carried though the venting system and the moisture exhausted above the roofline though the blower(s).

Prior to the installation of the Liquid Boot® vapor barrier layer, pressure probe ends shall be installed in the upper layer of the crushed stone for crawlspaces A, B and E. The probe details and locations are indicated on the detail drawings. Probe ends on the up gradient side of the crawlspace slope shall be located at least three feet in from the exterior wall and probe ends on the down slope end of the crawlspace shall be a minimum of six feet from the exterior crawlspace wall. All conduit and tubing shall slope up to the sensor box. In Crawlspace Sections A and B, the tubing and conduit will need to penetrate the longitudinal separation walls. At no time should sensor tubing or conduit be installed in a manner that would allow for the collection of water between the sensor and the probe end.

4.1.3 Vapor Collection Plenum

The vapor collection plenum shall consist of #57 stone. A centrally located four inch perforated PVC pipe shall be embedded in the stone the entire length of the segmented section of crawl space. The pipe shall have 5/8" holes located at the 4, 6, and 8 o'clock positions with the 6 o'clock set of holes facing down. This will prevent condensation form accumulating in the pipe. If pipe with the specified hole pattern cannot be locally sourced than 5/8" holes shall be drilled at the 6 o'clock position at four feet on center. PVC collection pipe that is embed in stone shall be Schedule 40 PVC ASTM D 2665 pipe. Once the conveyance pipe, stone and pressure differential probes have been installed, the Liquid Boot vapor barrier process may be installed.

4.1.4 Vapor Barrier (LIQUID BOOT®)

A continuous CETCO Liquid Boot® 60 mil vapor barrier shall be installed between the AASHTO #57 stone gravel bed and the top coating of three inches of Dense Graded Aggregate (DGA). The vapor barrier shall be installed by a CETCO licensed applicator. The Liquid Boot® shall be smoke tested and certified following the installation.

Liquid Boot is a laminate vapor barrier system consisting of a base layer fabric (T-60) to cover the 5 inch AASHTO #57 stone base. 60 dry mils of Liquid Boot is then spray applied to the T-60 fabric layer. A protective layer of G-1000 fabric is then applied directly to the Liquid Boot layer once cured.

Once the application of the Liquid Boot has been completed , a smoke test shall be conducted by the Liquid Boot licensed applicator to demonstrate the gas tight properties of the Liquid Boot application. The Quality Assurance smoke test can be accomplished by blowing the indicator smoke below the liner through the pipe system that is installed to vent sub liner gases. After a successful smoke test, the top coating of DGA can then be applied over the G-1000 fabric. 100% of the DGA must be able to pass through a ¾ inch sieve. Once the DGA has been applied, the top layer of concrete can then be installed. The DGA layer is expected to be approximately 8 inches thick.

The Liquid Boot® vapor barrier shall not be punctured under any circumstances for any reason. The concrete batch plant shall be contacted in advance to ensure that the concrete delivered is of sufficient slump to ensure that there is not excess water to be drained off. The structural, onsite consulting engineer or construction manager shall coordinate this task with the concrete contractor. Concrete buggies or other heavy equipment cannot cross the vapor mitigation system without bridging. Laser screeds and concrete pump equipment are permitted providing the concrete contractor coordinates the placement of equipment with the vapor mitigation contractor.

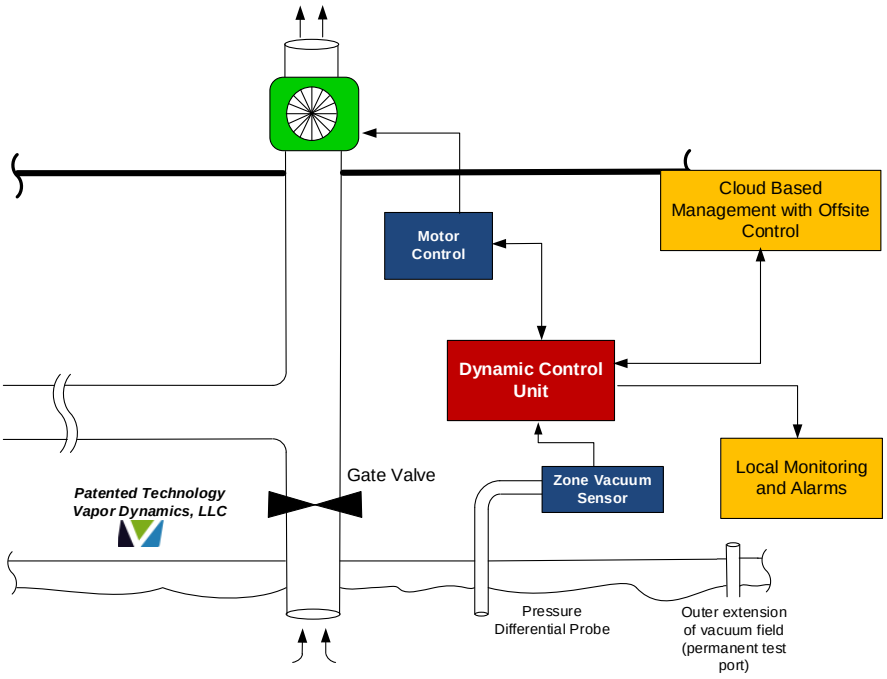
5.0 Vapor Guardian 5500 Dynamic Controls and Remote Management

Clean Vapor is a certified installer of the Vapor Dynamics, LLC Vapor Guardian 5500™ monitoring and controls panel. This panel offers the owner and consultant the ability to remotely monitor the performance the vapor intrusion mitigation system including sub slab pressure differentials, static system vacuum, and power consumption. This feature will ensure that sub slab vacuum levels are not breached thus creating a potential sub slab vapor pathway.

The Vapor Guardian 5500™ will electronically notify the consultant in the event of a system parameter fault. Electronic notifications can be triggered based on sub slab or system static vacuum set points. The system integrates the use of a 4G Verizon modem for control and data monitoring. If sufficient signal strength is not achieved at the location of the transmitter, a roof mounted antenna, which is approximately 12 inches tall, may need to be installed. The exact location of the monitoring hardware is at the discretion of installation contractor and the owner and shall be noted in the final system As-Built drawings. The following metrics will be monitored for each system; power consumption, applied vacuum, vacuum at the outer extent of the sub slab and sub liner the pressure fields.

The Vapor Guardian 5500TM, in addition to remotely monitoring the system, will also dynamically control the blower systems. Dynamic controls enable the vapor intrusion mitigation

system to maintain a constant predetermined sub slab pressure differential that is individually set for each blower system as part of the electronic management and monitoring system. The system monitors the sub slab vacuum levels and self corrects for pressure induced changes that may occur from HVAC operation, exhaust appliances, wind loading and temperature induced indoor pressure differentials. Section 2.1 discussed the unusual high temperature induced sub slab to indoor pressure differentials that exist at this building. The convection associated with indoor to outdoor temperature differentials are the main force that drives vapor intrusion. These conditions make it a prime candidate for the integration of dynamic controls. Wind induced pressure differentials at this building will be amplified because of the angularity of the building and high sloped roofs. This will be more problematic during the winter months when outside air is dense and temperature differentials are the greatest. The same principles of moving air over a longer distance that creates the vacuum to induce lift in airplane wings apply to this building. The low pressures that are induced as air travels over the high pitched roofs will create a series of low pressure pockets that will vary in intensity with a change in wind speed and direction. Gusts and the resultant turbulence will create the most sever low pressures. These low pressures are transferred into the building though the leakage associated with the roof, windows and exhaust appliance ports. The sub slab and sub liner differential pressure sensors are continually monitored by a programmable logic controller (PLC) which controls the variable frequency drive (VFD) to adjust the blower speed to maintain the predetermined sub slab or sub liner vacuum set point. It is anticipated that a dampening function will need to be applied to the drive algorithm so blowers do not servo in response to varying wind speeds. The performance data from each blower is stored for analysis and reporting (if required). All performance metrics are monitored hourly and an email is sent if a system's metrics are operating outside of a predetermined range. This system operates 24/7 and provides the finest energy saving and liability reduction that technology offers.



Vapor Guardian Control Logic and Monitoring Diagram

6.0 General Installation Notes

All mitigation system components will be installed to facilitate servicing, maintenance and repair or replacement of other equipment components in or outside the building. Where mounting heights are not detailed or dimensions not given, system materials and equipment are to be installed to provide the maximum headroom or side clearance as is possible. The owner's representative will be contacted in cases where a conflict exists. All systems, materials and equipment will be installed level, plumb, parallel or perpendicular to other building systems and components unless otherwise specified.

Every reasonable precaution shall be made to avoid any damage to existing utilities located anywhere in the building or those located in or below the slab floor. Detailed blueprints indicating utility piping in or under the slab are not available. Undocumented sub slab utilities may alter the scope of work. A metal detecting relay box or another similar instrument should be used in conjunction with any slab drilling that does not involve wet coring.

All penetrations through the foundation walls and the roof shall be sealed. There will be no placement of piping or conduit that would inhibit intended use of any areas. No foreign materials shall be left or drawn into the vapor system piping or fan which might at a later period interfere with or in any way impair the vapor system performance. The entire system will have UL or equivalent ratings for both individual components and the entire system as applicable.

7.0 System Materials

I. Vapor Vent Piping
   a. PVC Schedule 40 pipe and fittings ASTM D-2665
      i. Hollow Core PVC is not permissible
   b. PVC cement clear primer will comply with ASTM F-656
   c. PVC cement adhesive will comply with ASTM D-2564
   d. 3 and 4 inch Inline PVC slide valves (Valterra Bladex)

II. Piping Supports and Hardware
   a. 3", 4" Hanging Pipe Supports
   b. Adjustable swivel ring or standard bolt type clevis hangers
   c. Adjustable band hangers
   d. 3/8" threaded rod
   e. 1/2" threaded rod
   f. Conduit clamps
   g. Assorted bolts, nuts & washers
   h. 1 5/8" C- Profile Galvanized Unistrut
   i. 13/16" C- Profile Galvanized Unistrut

III. Vapor Barrier
   Mirafi 500X Geotextile Fabric
   CETCO Liquid Boot

IV. Collection Plenum

V. 4" PVC Pipe ASTM D-2665

VI. Blowers
   a. Cincinnati Fan PB-9 (2)
   b. Cincinnati Fan PB-10A (3)

VII. Frequency Inverter
   a. Mitsubishi FR 800 (5)

VIII. Blower Support Frames
   a. 1 5/8" C- Profile Galvanized Unistrut
   b. Dura Block Composite roofing blocks DB 10

IX. Visual Pressure Indicator and Protective Enclosure
   a. Magnehelics, Dwyer Instruments Inc. Model 2008 (5)

X. Sealing Materials
   a. Gun Grade Urethane Caulk (Vulkem 116)
   b. Flowable Urethane Caulk (Vulkem 45SSL)

XI. Fire Collars
   a. 3″ and 4″ Fire Collars (Hilti)

XII. Remote Monitoring
   a. Vapor Guardian 5500 (Vapor Dynamics)
   b. 4G Modem

c. Dwyer Magnesense Differential Pressure Transmitters 4-20 mili amp
d. Dwyer Magnesense Vacuum Sensors Series 668-4 0"- 25" w.c. (5)
e. Dwyer Magnesense MS 121 (5)

Note: Hilti is the suggested manufacturer of fastening products and fire collars

8.0 Administrative and Final Report

8.1 Permits

It is the responsibility of the mitigation contractor to secure any municipal permits. The owner will need to provide building access for the municipal building inspectors or any other jurisdictional authority to inspect the relevant components of the SSDS.

8.2 Warranties

The mitigation contractor shall warranty all system components, workmanship, and a sub slab vacuum level of -0.004" w.c. for a period of one year from the date of system commissioning. Sub slab vacuum extension values are based on the conditions at the date of the diagnostic measurements. The client will not incur any cost for warranty work performed during this period. Fluctuating water tables, sink holes, and other unforeseen sub slab anomalous conditions that may affect sub slab soil gas channeling after commissioning values have been achieved may be considered outside of the warranty. Repairing system damage caused by others is not included in the warranty. Clean Vapor's warranty does not apply to systems installed by others.

8.3 Final Project Report

The pressure field extension beneath the sub slab created by each SSDS shall be measured with a digital micro-manometer capable of reading down to 0.0001 inches water column. The slide valves in the riser pipes shall be adjusted to facilitate maximum vacuum distribution. Static vacuum measurements for each system will be recorded. All vacuum measurements will be measured in inches of water column. The exhaust airflow from each blower system shall be measured, calculated and reported in CFM. Data will be assembled in a pressure field measurement table.

The final report summarizing remedial activities shall include a summary of remedial activities, As Built drawings, blower and system performance tables, photo documentation, equipment warranties and material submittals.

The As Built drawing will be a modification of the original design print and include: all blowers and suction points, the specific locations of all blowers, including manufacturer, model and amperage draw, and the locations of piping and connected suction points. The electrical panel

location and breaker number will also be noted for each blower. The location of all low pressure gauges will also be on the drawing. The title block will include the final system installation date.

Photo documentation will include at least one picture of the blowers installed, the low pressure panel, system labels, suction points, relevant sealing, fire stopping, roof penetrations, post-mitigation vacuum testing and pictures thought to be important by the owner or Stantec. Warranties and Submittals will include: all blower warranties, performance and wiring information, and Material "cut sheets".

The Operations and Maintenance Section will include a table of items to be checked quarterly along with login information to the Vapor Dynamics terminal. The table will include each blower numbered in accordance with the As Built drawing, suction points and system static vacuum. A copy of the final report will be maintained by Clean Vapor, Stantec and the owner.

8.4 Submittals

The mitigation contractor shall provide copies of submittals to Stantec:

I. Pre Work Submittals
    a. Copy of N.E.H.A. Radon Proficiency Radon Mitigation Certification
    b. Equipment Manufacturer Cut Sheets
II. Post Work Submittals
    a. As Built drawings to include all applicable mechanical component locations
    b. Final project report
    c. OM&M instructions and recommendations
    d. Access to Vapor Dynamics remote login terminal

Appendix A – Drawings

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
200 WEST 2ND STREET
HASTINGS, MN 55033

AUGUST 24, 2016
REVISION #1 3-22-17
REVISION #2 12-18-17
REVISION #3 8-13-19

DRAWING LIST

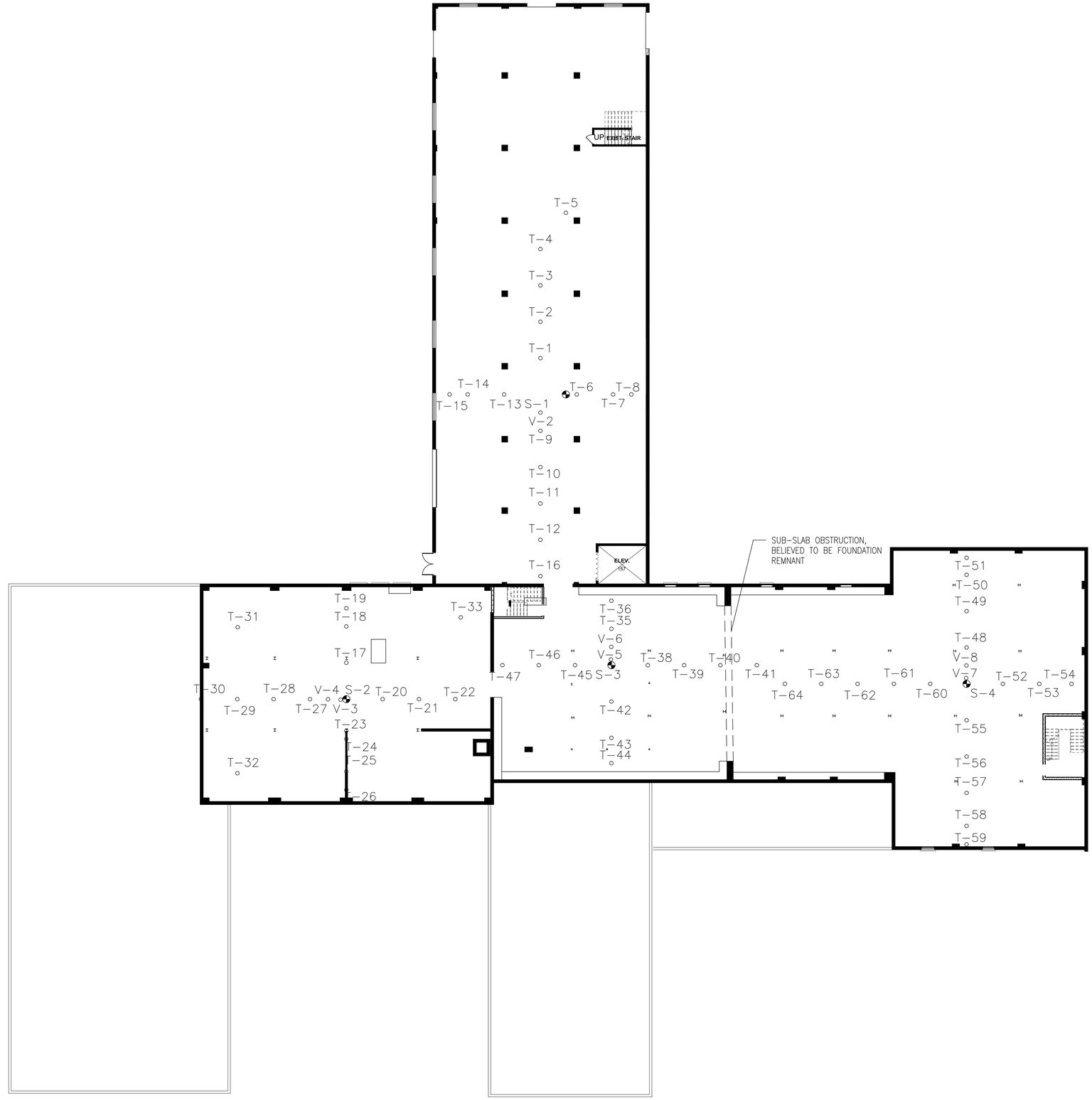
C	Cover
1	Diagnostic Test Holes
2	Basement Sealing Plan
3	Basement Suction Points
4	First Floor Risers
5	Second Floor Risers
6	Loft / Roof Plan
7	Mechanical Details
8	Mechanical Details

CLEAN VAPOR LLC
V.O.C. & RADON PLAN DESIGN AND REMEDIATION

CLEAN VAPOR LLC

P.O. BOX 688, BLAIRSTOWN, NEW JERSEY 07825

Ph 908 362-5616 Fax 908 362-5433 www.cleanvapor.com



BASEMENT PLAN

0 12' 36'
6' 24' 48'
GRAPHIC SCALE

LEGEND

T-1 TESTHOLE

V-2 VELOCITY TEST HOLE

S-1 SUCTION POINT

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CLEAN VAPOR LLC
V.O.C. & RADON FLUX DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
HASTINGS, MN 55033

REVISION	DATE
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

DIAGNOSTIC TEST HOLES

SHEET NO.

1

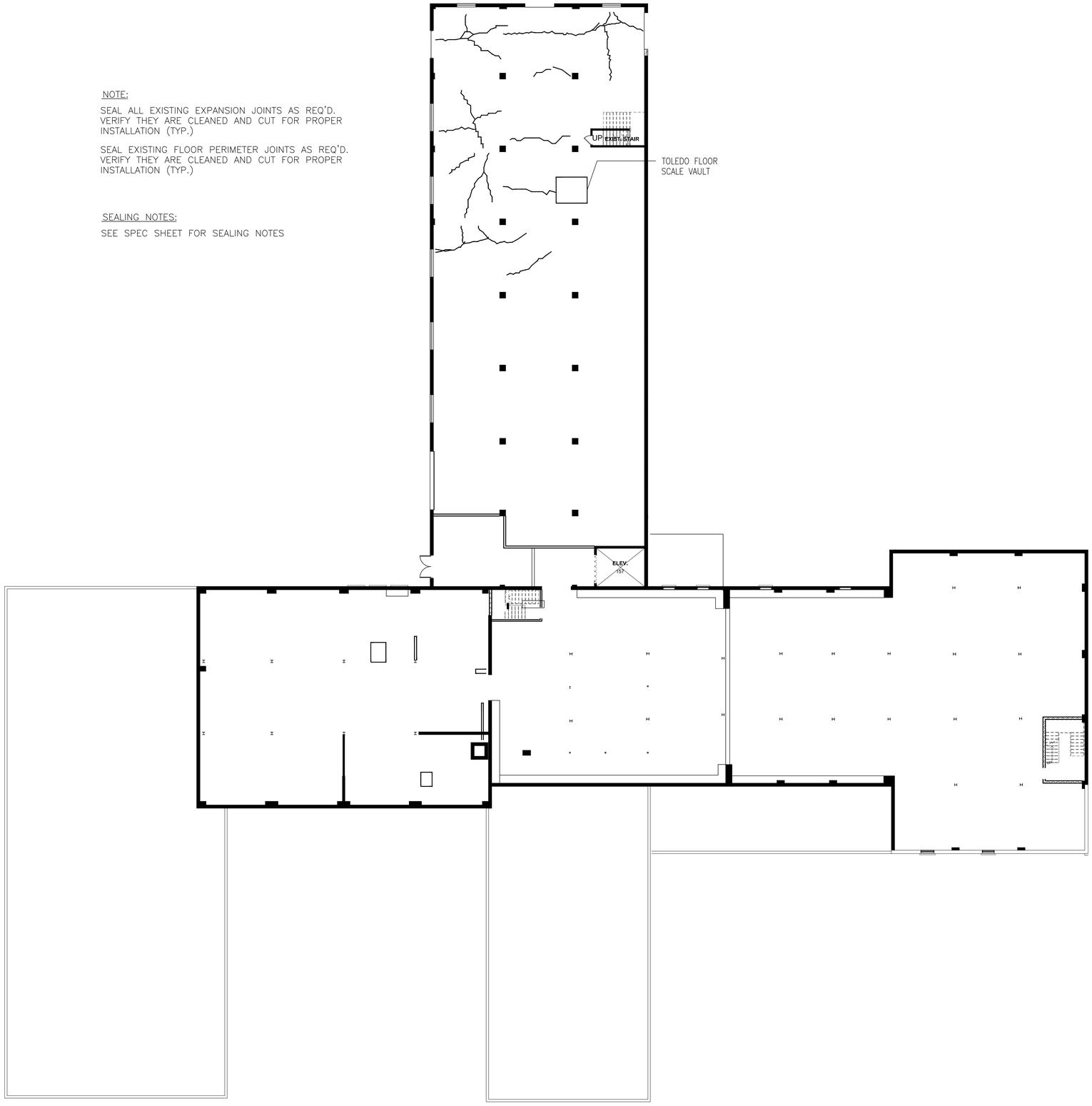
NOTE:

SEAL ALL EXISTING EXPANSION JOINTS AS REQ'D. VERIFY THEY ARE CLEANED AND CUT FOR PROPER INSTALLATION (TYP.)

SEAL EXISTING FLOOR PERIMETER JOINTS AS REQ'D. VERIFY THEY ARE CLEANED AND CUT FOR PROPER INSTALLATION (TYP.)

SEALING NOTES:

SEE SPEC SHEET FOR SEALING NOTES



BASEMENT PLAN

0 12' 36'

6' 24' 48'

GRAPHIC SCALE

LEGEND

EXPANSION JOINT

CRACK IN CONCRETE

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CLEAN VAPOR LLC
VOC & RADON FLUX DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
HASTINGS, MN 55033

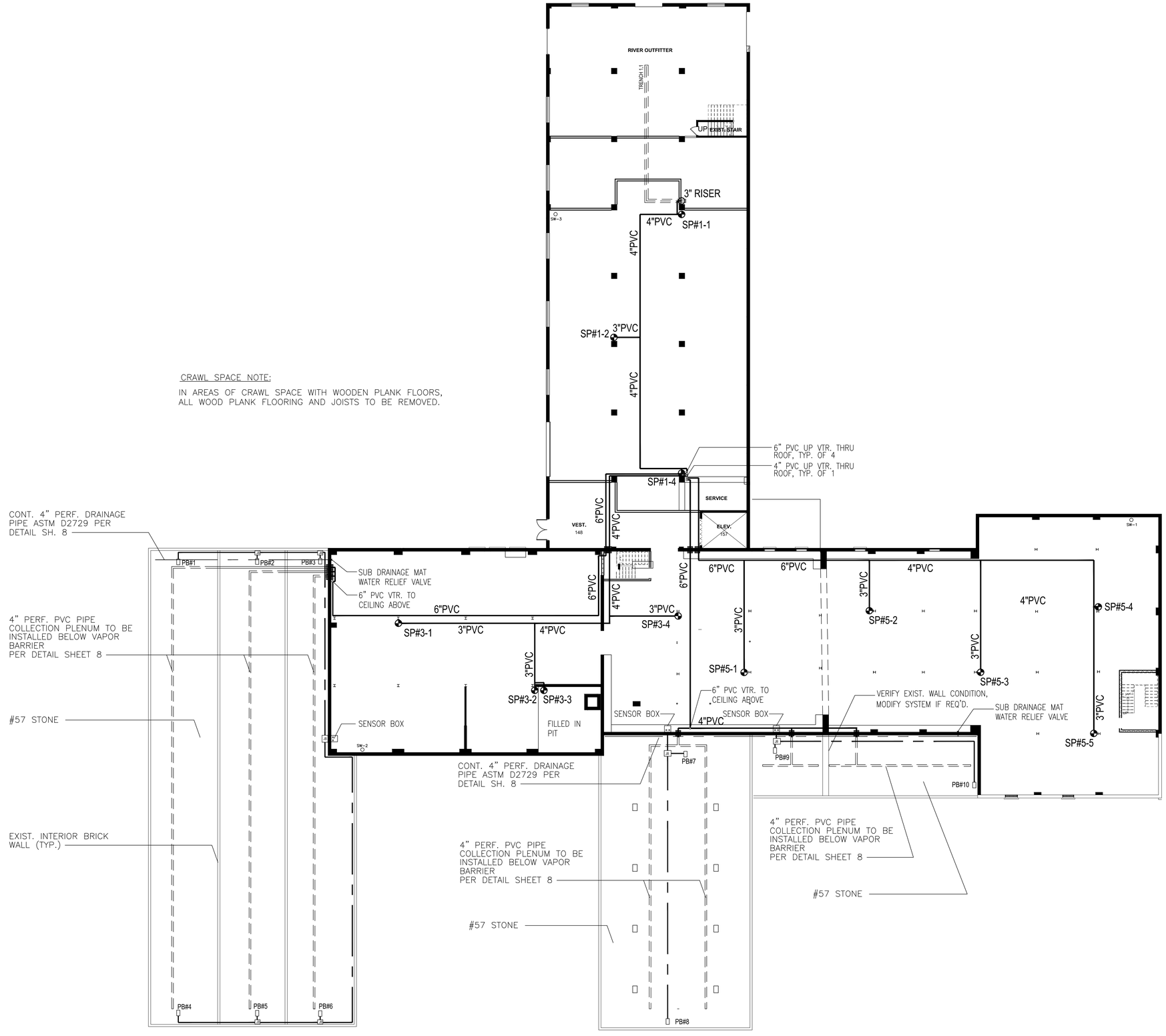
REVISION	DATE
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

SEALING PLAN

SHEET NO.

2



CRAWL SPACE NOTE:

IN AREAS OF CRAWL SPACE WITH WOODEN PLANK FLOORS, ALL WOOD PLANK FLOORING AND JOISTS TO BE REMOVED.

BASEMENT PLAN

0 12' 36'
6' 24' 48'
GRAPHIC SCALE

LEGEND

SP#16	SUCTION POINT
	MAGNEHELIC PANEL*
	VAPOR GUARDIAN PANEL*
- - -	SENSOR CONDUIT
JB	JUNCTION BOX
PP#1	REMOTE MONITORING PORT
SW-1	SENSOR WELLS
	FIRE COLLAR
==	4" PERF. PVC PIPE
– –	3" PERFORATED PVC PIPE HOLES 6"O.C. 180° IN TRENC

* LOCATION TO BE DETERMINED

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CLEAN VAPOR LLC
V.O.C. & RADON PURGE DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
HASTINGS, MN 55033

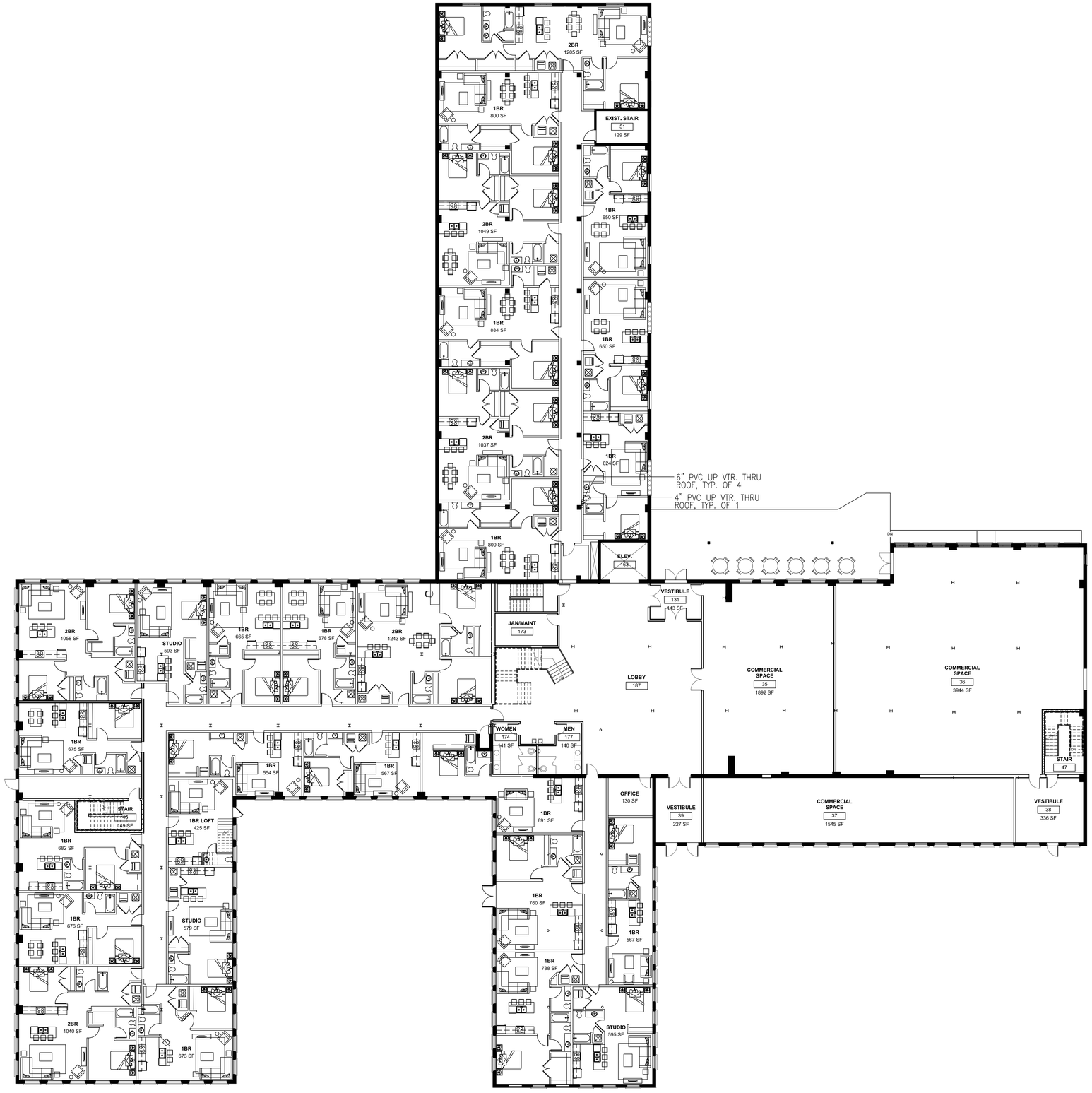
REVISION	DATE
REV #2	12-19-17
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

SUCTION PT. & BLOWERS

SHEET NO.

3



FIRST FLOOR PLAN

0 12' 36'

6' 24' 48'

GRAPHIC SCALE

LEGEND

○ RISER PIPE, PER PLANS

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ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
HASTINGS, MN 55033

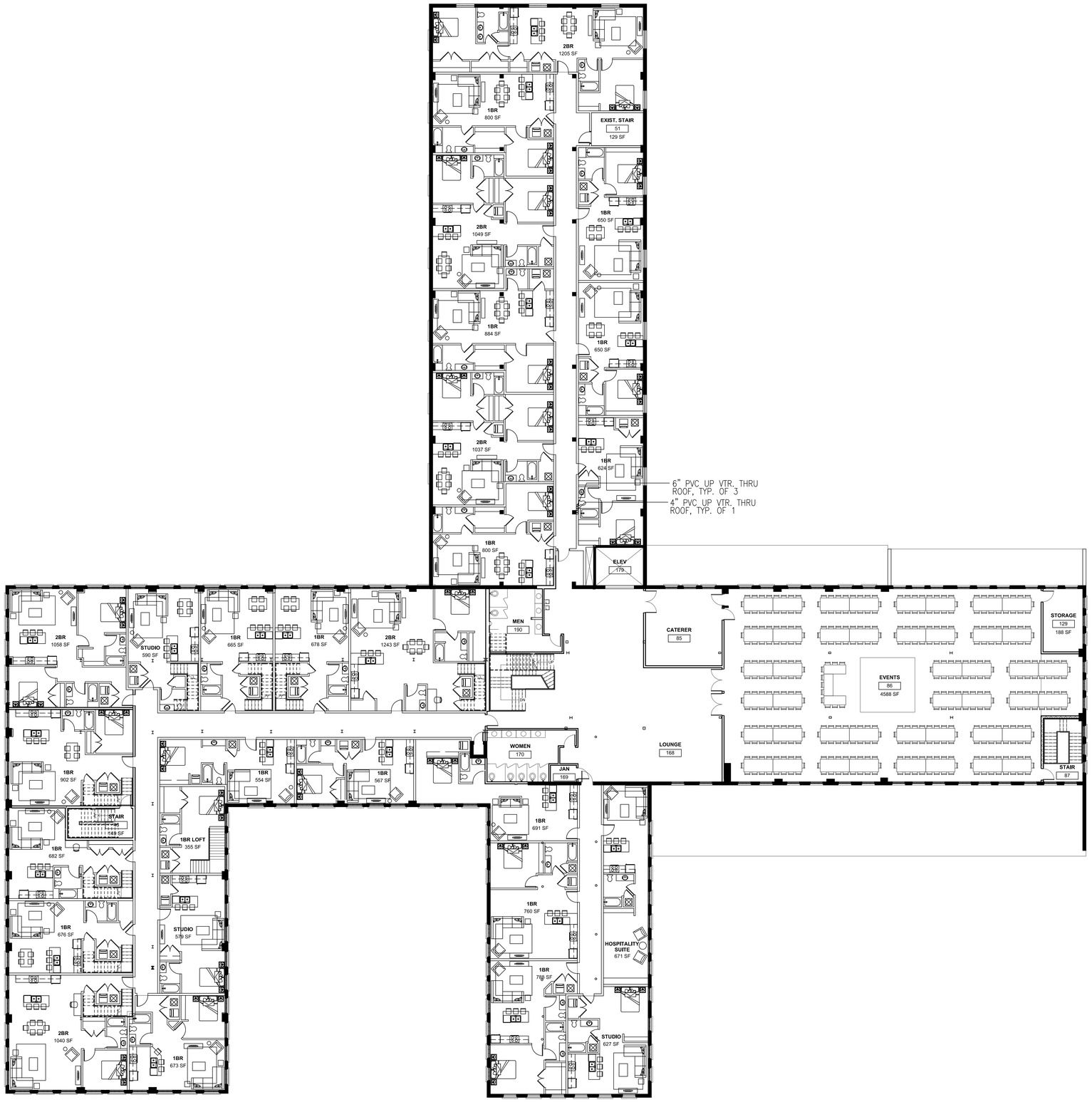
REVISION	DATE
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

FIRST FLOOR RISERS

SHEET NO.

4



SECOND FLOOR PLAN

0 12' 36'

6' 24' 48'

GRAPHIC SCALE

LEGEND

° RISER PIPE, PER PLANS

CLEAN VAPOR LLC
P.O. BOX 688, BLAIRSTOWN, NJ 07825
Ph. 908 362- 5616 Fax. 908 362-5433
www.cleanvapor.com

CLEAN VAPOR LLC
V.O.C. & RADON PLAN DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER HD HUDSON MANUFACTURING FACILITY
HASTINGS, MN 55033

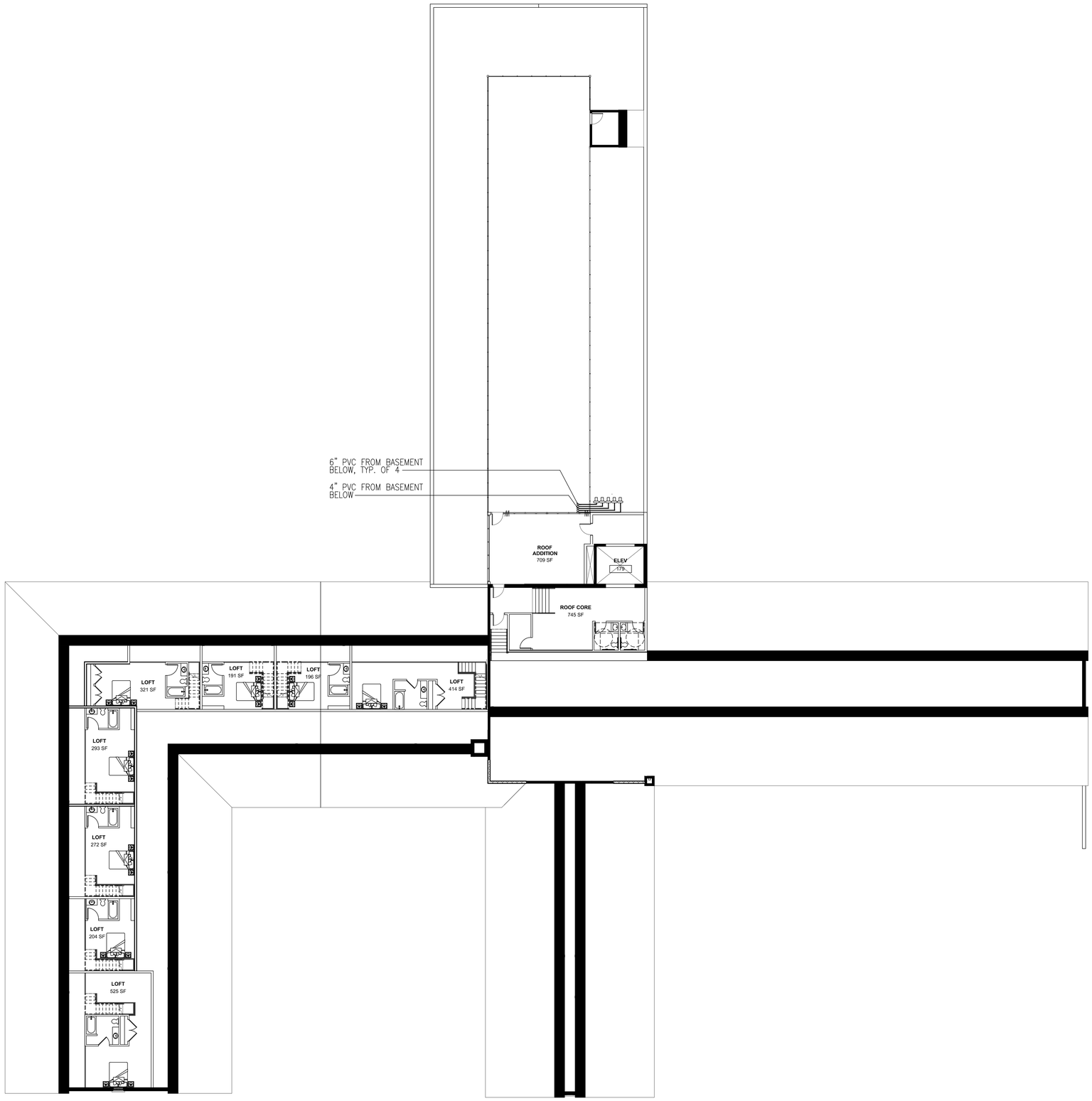
REVISION	DATE
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

2ND FLOOR RISERS PLAN

SHEET NO.

5



LOFT / ROOF PLAN

0 12' 36'
6' 24' 48'
GRAPHIC SCALE

LEGEND

CINCINNATI FAN BLOWERS

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VOC & RADON FLUX DESIGN AND REMEDIATION

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HASTINGS, MN 55033

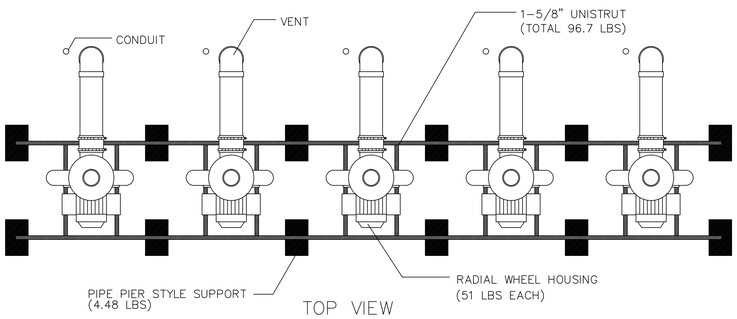
REVISION	DATE
REV #3	8-13-19
	8/24/16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

LOFT / ROOF PLAN

SHEET NO.

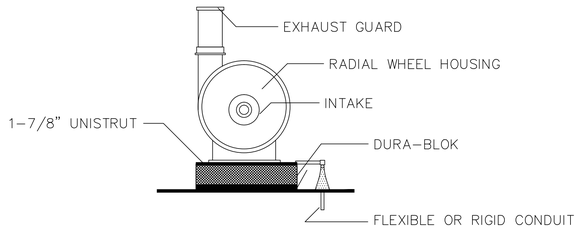
6



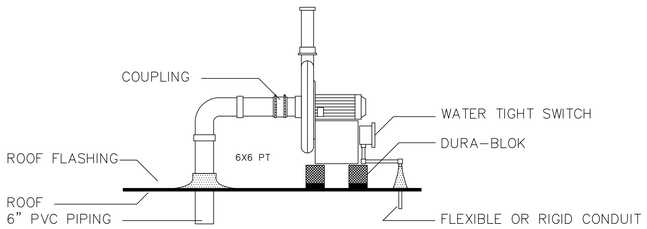
TOP VIEW

RADIAL BLOWER BANK

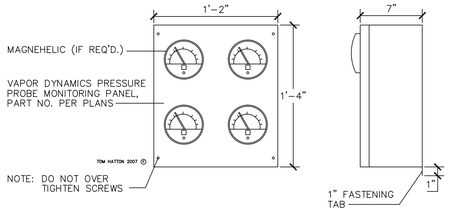
RADIAL BLOWER SIDE VIEW DETAIL



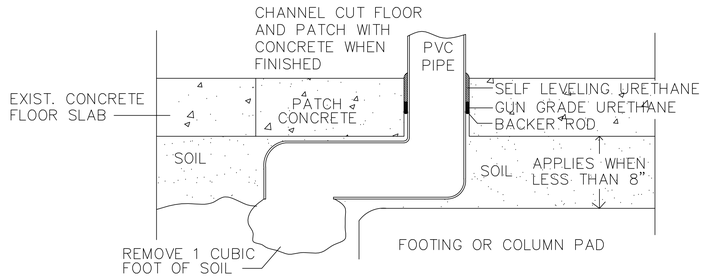
RADIAL BLOWER



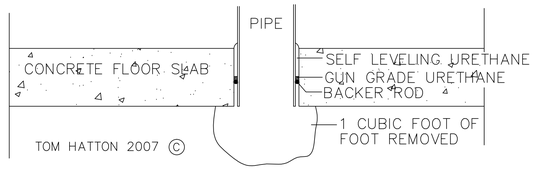
MAGNEHELIC AND PROTECTIVE BOX ENCLOSURE DETAILS

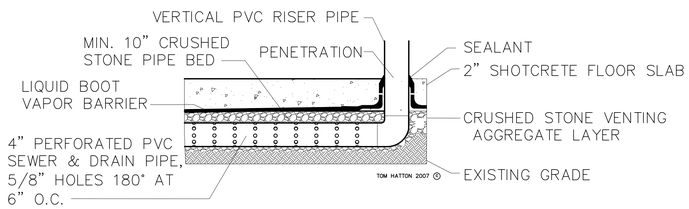


SUCTION POINT DETAIL AT FOOTER



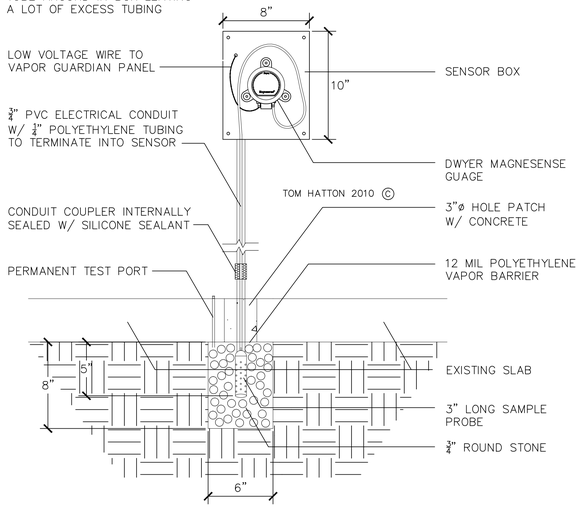
SUCTION POINT DETAIL



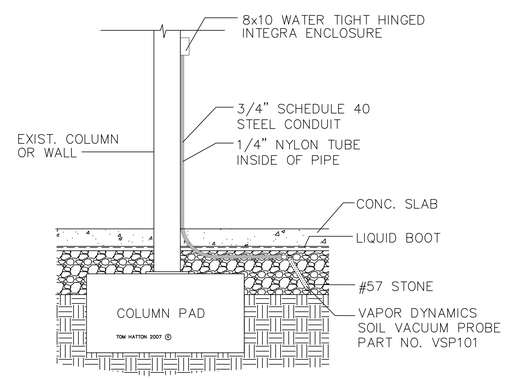


RISER PIPE/HORIZ. COLLECTION PIPE

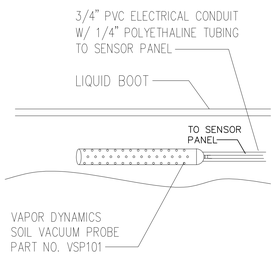
NOTE:
MOUNT SENSOR UPRIGHT, COIL
TUBE AROUND IN BOX LEAVING
A LOT OF EXCESS TUBING



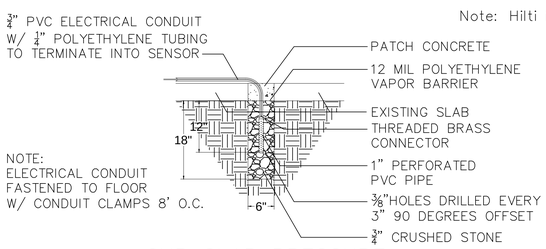
SUB SLAB PRESSURE PROBE DETAIL



SUB SLAB PRESSURE PROBE DETAIL



PRESSURE PROBE DETAIL



SUB SLAB PRESSURE PROBE DETAIL

EQUIPMENT SCHEDULE

I. Vapor Vent Piping
- a. PVC Schedule 40 pipe and fittings ASTM D-2665
  - i. Hollow Core PVC is not permissible
- b. PVC cement clear primer will comply with ASTM F-656
- c. PVC cement adhesive will comply with ASTM D-2564
- d. 3 and 4 inch Inline PVC slide valves (Valterra Bladex)

II. Piping Supports and Hardware
- a. 3", 4" Hanging Pipe Supports
- b. Adjustable swivel ring or standard bolt type clevis hangers
- c. Adjustable band hangers
- d. 3/8" threaded rod
- e. 1/2" threaded rod
- f. Conduit clamps
- g. Assorted bolts, nuts & washers
- h. 1 5/8" C- Profile Galvanized Unistrut
- i. 13/16" C- Profile Galvanized Unistrut

III. Vapor Barrier
- Mirafi 500X Geotextile Fabric
- CETCO Liquid Boot

IV. Collection Plenum

V. 4" PVC Pipe ASTM D-2665

VI. Blowers
- a. Cincinnati Fan PB-9 (2)
- b. Cincinnati Fan PB-10A (3)

VII. Frequency Inverter
- a. Mitsubishi FR 800 (5)

VIII. Blower Support Frames
- a. 1 5/8" C- Profile Galvanized Unistrut
- b. Dura Block Composite roofing blocks DB 10

IX. Visual Pressure Indicator and Protective Enclosure
- a. Magnehelics, Dwyer Instruments Inc. Model 2008 (5)

X. Sealing Materials
- a. Gun Grade Urethane Caulk (Vulkem 116)
- b. Flowable Urethane Caulk (Vulkem 45SSL)

XI. Fire Collars
- a. 3nj4" and 6nj Fire Collars (Hilti)

XII. Remote Monitoring
- a. Vapor Guardian 5500 (Vapor Dynamics)
- b. 4G Modem
- c. Dwyer Magnesense Differential Pressure Transmitters 4-20 mili amp
- d. Dwyer Magnesense Vacuum Sensors Series 668-4 0"- 25" w.c. (5)
- e. Dwyer Magnesense MS 121 (5)

Note: Hilti is the suggested manufacturer of fastening products and fire collars

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ACTIVE SOIL DEPPRESSURIZATION SYSTEM
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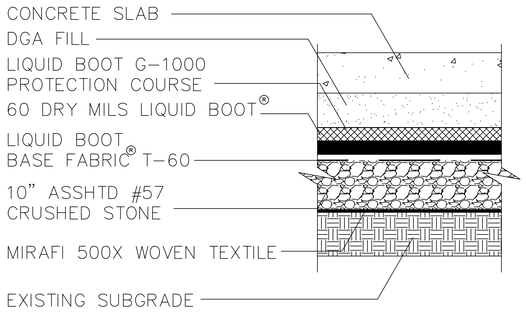
1100 FRANK E RODGERS BLVD. SOUTH
HASTINGS, MN 55033

THOMAS E. HATTON
NEHA I.D. 104705
NJDEP MIS 10245

REV #2 REV #3	12-19-17 8-13-19
DATE	8-24-16
DRAWN BY	DAB
APPROVED	TEH
SCALE	NTS
CHECKED BY	TEH

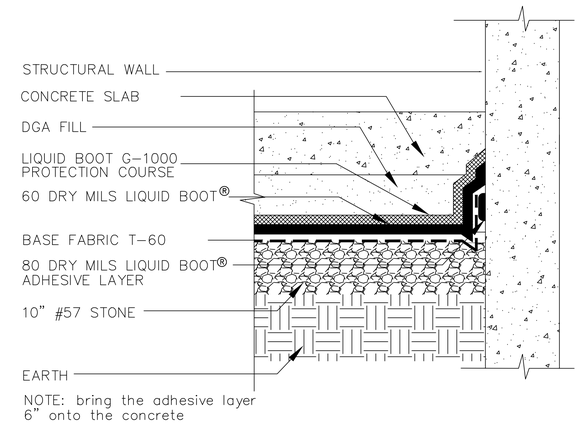
SHEET TITLE
MECHANICAL DETAILS

SHEET NO.
7

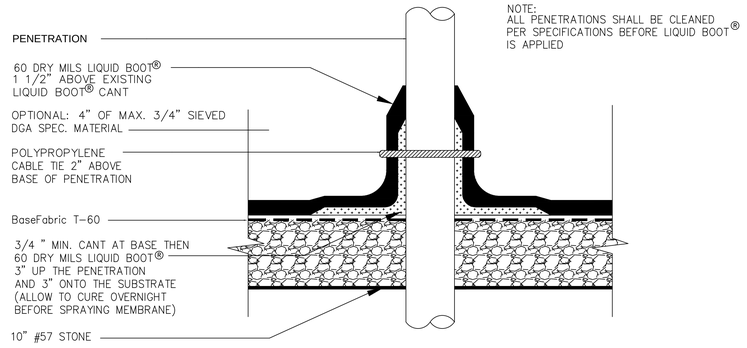


LIQUID BOOT SECTION

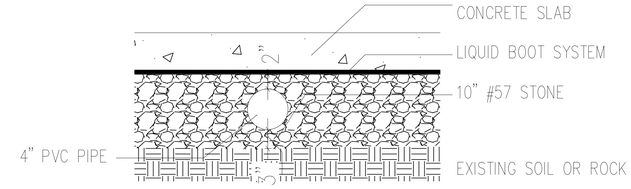
NOTE: Do not puncture vapor barrier or other components of vapor mitigation system under any circumstances. Should the vapor barrier or other components of vapor mitigation system be damaged ï damage shall be repaired as required and specified by the system manufacturer/installer.



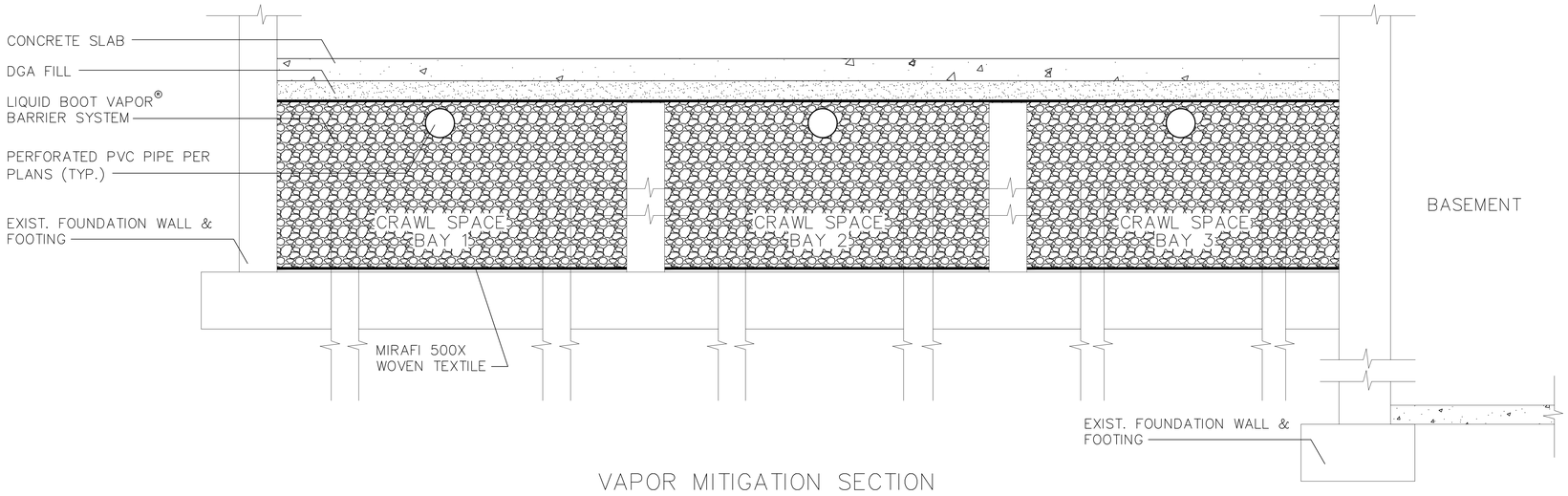
GAS VAPOR BARRIER VERTICAL ATTACHMENT



GAS VAPOR BARRIER PENETRATION



UNDERSLAB VAPOR PIPE SECTION



VAPOR MITIGATION SECTION

CLEAN VAPOR LLC
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Ph. 908 362-5616 Fax. 908 362-5433
www.cleanvapor.com

CLEAN VAPOR LLC
VOC & RADON PEAK DESIGN AND REMEDIATION

ACTIVE SOIL DEPPRESSURIZATION SYSTEM
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1100 FRANK E RODGERS BLVD. SOUTH
HASTINGS, MN 55033

THOMAS E. HATTON
NEHA I.D. 104705
NJDEP MIS 10245

REV #1 REV #3	3-22-17 8-13-19
DATE	8-24-16
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE
MECHANICAL DETAILS

SHEET NO.
8

BID RESPONSE FORM

Former H.D. Hudson Manufacturing Facility
200 West 2nd Street
Hastings, Minnesota

Item No.	Item	Unit	Estimated Quantity	Unit Price	Price
1	Mobilization/Demobilization.	LS	1		
2	Clean the basement ceiling and joists (Overview Figure Areas C, D and F) and the first-floor ceiling and joists (Overview Figure Areas A, B, C, D, E, F and H).	LS	1		
3	Clean the first-floor floor joists (Overview Figure Areas A, B, E and H) with Sika Corporation Sikagard 62 in Oxford Grey.	LS	1		
4	Remove the hardened tar-like substance from the first-floor concrete flooring (Overview Figure Area G).	LS	I		
5	Seal the basement ceiling and joists (Overview Figure Areas C, D and F) with Sika Corporation Sikagard 62 in Oxford Grey.	LS	1		
6	Seal the first-floor ceiling and joists (Overview Figure Areas A, B, C, D, E, F and H) with Sika Corporation Sikagard 62 in Oxford Grey.	LS	1		
7	Seal the first-floor floor joists (Overview Figure Areas A, B, E and H) with Sika Corporation Sikagard 62 in Oxford Grey.	LS	1		
8	Apply touch up sealant to area impacted by construction work.	LS	1		
9	Load, haul and dispose of solids/particulates/contaminated materials (e.g. protective clothing, broom, brushes, etc.) as a special waste at a MPCA-approved waste disposal facility.	LB	50		
10	Load, haul and dispose of solids/particulates contaminated materials (e.g. protective clothing, broom, brushes, etc.) as a hazardous waste at a MPCA-approved waste disposal facility.	LB	50		
11	Load, haul and dispose of liquids as a special waste at a MPCA-approved waste disposal facility.	GAL	100		
12	Load, haul and dispose of liquids as a hazardous waste at a MPCA-approved waste disposal facility.	GAL	100		

Total Bid _____

Bidder Name_____ Business Address_____

Signed by _____ _____

Title _____ Telephone No. _____

Email _____ Fax No. _____

If you have questions, contact:

Responsible Party Representative: **John Hinzman (Hastings Economic Development and Redevelopment Authority) @ 651-480-2378**
JHinzman@hastingsmn.gov

Engineer Representative: **Dave Constant (Stantec) @ 612-712-2031**
David.Constant@stantec.com

REFERENCES

Contractor shall provide a list of three (3) significant special projects consisting of the encapsulating wooden ceilings and joints with sealants in the last three (3) years. At least two (2) projects must have a project cost greater than $50,000.

Project No.1

Project Name and Location _____
Dates for Project _____
Scope of Work _____
Final Project Cost _____
Project Contact _____
Contact Telephone Number _____
Contact Email _____

Project No.2

Project Name and Location _____
Dates for Project _____
Scope of Work _____
Final Project Cost _____
Project Contact _____
Contact Telephone Number _____
Contact Email _____

Project No.3

Project Name and Location _____
Dates for Project _____
Scope of Work _____
Final Project Cost _____
Project Contact _____
Contact Telephone Number _____
Contact Email _____

MANDATORY PRE-BID MEETING

A mandatory pre-bid meeting will be held at the former H.D. Hudson Manufacturing Facility, 200 West 2nd Street, Hastings, Minnesota on **September 17, 2019** at 11:00 am to review existing site conditions and access. All questions must be submitted in writing. Verbal statements may not be relied upon and will not be binding or legally effective.

PRE-BID QUESTIONS

Bidders are encouraged to submit bid questions via email to David Constant (David.Constant@stantec.com) and Hiedi Waller (Hiedi.Waller@stantec.com) by 4:00 pm on **September 19, 2019**. Engineer will respond to questions in writing by 4:00 pm on **September 20, 2019**. The response will be available on the City's website at www.hastingsmn.gov.

PROJECT TIMELINE

Bids are due by 4:00 pm on **September 25, 2019**. Bids shall be submitted by email to John Hinzman (JHinzman@hastingsmn.gov). Work shall be awarded by **September 26, 2019. Work shall be substantial complete by November 8, 2019** and completed by **December 31, 2019**.

SPECIFICATIONS

1. GENERAL REQUIREMENTS
   - 1.1 Owner: The Owner is Confluence Development LLC.
   - 1.2 Responsible Party: The Responsible Party is the Hastings Economic Development and Redevelopment Authority.
   - 1.3 Engineer: The Engineer is Stantec Consulting Services Inc.
   - 1.4 City: The City is Hastings, Minnesota.
   - 1.5 Work includes cleaning and sealing the basement ceiling and joists and the first-floor ceiling, joists and floor joists with Sika Corporation Sikagard 62 in Oxford Grey.
   - 1.6 Responsible Party reserves the right to not award all Bid Items.
   - 1.7 Substantial Completion Date: Work shall be substantially completed by November 8, 2019. Work shall be substantially complete when identified surfaces have been cleaned and sealed and sealant surface samples have been submitted to an analytical laboratory.
   - 1.8 Work shall be complete by December 31, 2019.
   - 1.9 Access: All construction access for personnel, equipment and materials shall be through 2nd Street West, Lock and Dam Road or the access road to the parking area under the Highway 61 Bridge.
   - 1.10 Hours: Work hours are restricted to 7:00 am – 7:00 pm, Monday through Friday.
   - 1.11 Conformance: Unless identified otherwise, all work shall conform to the Minnesota Department of Transportation "Standard Specifications for Construction," 2018 Edition (MnDOT Spec.) and the "Materials Lab Supplemental Specifications for Construction" 2018 Edition (MnDOT Mat.).
   - 1.12 Building Services: The building is heated and limited electricity is available.
   - 1.13 Permits: Contractor will be responsible for obtaining and administering all applicable federal, state and local permits required for cleaning and encapsulating the basement ceiling and joists and the first-floor ceiling and joists. All costs associated with such permits shall be included in the Mobilization/Demobilization Bid Item.
   - 1.14 Retainage: Fifteen percent of the Total Bid Cost shall be retained by the Responsible Party until Contractor has completed any required re-sealant application as outlined in Section 5 below.
   - 1.15 Traffic: Contractor shall provide, erect, maintain and later remove any traffic control measures (i.e. barricades, traffic control devices) necessary to facilitate cleaning and encapsulating the basement ceiling and joists and the first-floor ceiling and joists. All costs associated with traffic control measures shall be included in the Mobilization/Demobilization Bid Item.
   - 1.16 Mobilization/Demobilization: Contractor shall include costs to mobilize/demobilize appropriate equipment and personnel to complete the requested Work.
   - 1.17 Security: The Owner and/or the Responsible Party shall secure the building as necessary to exclude unauthorized access.
   - 1.18 Health and Safety: Contractor shall follow all applicable federal, state and local regulations. Contractor shall develop a Site Safety and Health Plan (SSHP). Cost for the SSHP shall be included in the Mobilization/Demobilization Bid Item. Contractor is responsible for site safety at all times. Contractor employees shall have completed an Occupational Safety and Health Administration 40-hour HAZWOPER training course and the 8-hour annual refresher training, as needed. All PPE to be containerized and properly disposed.
   - 1.19 Laboratory Analytical Reports: Available upon request. Summary information is below.

1.19.1 1st Floor Ceiling Sample Results: No PCBs were detected in samples collected from the 1st Floor ceiling. Select PAHs (chrysene and/or phenanthrene) were detected at concentrations up to 39,000 micrograms per kilogram (ug/kg) in areas that were visibly stained. Total lead was detected at concentrations ranging from 23 to 340 parts per million (ppm).

1.19.2 Basement Ceiling Sample Results: Total PCBs were detected (7,400 ug/kg and 7,500 ug/kg). Select PAHs (chrysene, fluoranthene, and/or phenanthrene) were detected at concentrations up to13,000 ug/kg in areas which were visibly stained. Total lead was detected at concentrations ranging from 24 to 46 ppm.

1.19.3 A summary table of analytical results and figures showing sampling locations are in Attachment A.

1.19.4 The MPCA-approved work plans for the encapsulation are available upon request.

1.20 Protection and Preparation: Take all necessary precautions to adequately protect personnel and property in the areas of Work. Confine dust and debris to immediate areas of work being performed.

1.21 Scheduling: Notify Owner and City of proposed work schedule, both weekly and daily. Coordinate operations involving extreme noise and vibration with Owner and City a minimum of 24 hours prior to such operations.

1.22 Vapor Intrusion Mitigation System (VIMS) installation may be occurring (by Others) during the schedule of this Work. Contractor shall coordinate schedules with the VIMS contractor to minimize conflicts.

1.23 Documentation: Contractor shall provide Engineer and Responsible Party with all permits, receipts, disposal documentation and/or manifests obtained.

1.24 Bonds: Separate Performance and Payment Bonds shall be submitted utilizing EJCDC Form C-610 and C615 or a similar bond form if approved by Responsible Party. Bid Bonds are not required.

1.25 Insurance

1.25.1 Contractor shall supply statutory worker's compensation coverage.

1.25.2 Employer's liability shall be $1,000,000 per employee.

1.25.3 Contractor shall maintain General Liability

i.	General Aggregate	$1,000,000
ii.	Products - Completed Operations Aggregate	$1,000,000
iii.	Personal and Advertising Injury	$1,000,000
iv.	Each Occurrence (Bodily Injury and Property Damage)	$1,000,000
v.	Excess or Umbrella Liability:	
	1. General Aggregate	$1,000,000
	2. Each Occurrence	$1,000,000

vi. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.

1.25.4 Umbrella excess liability shall be a combined single limit which shall provide excess liability insurance over Commercial General Liability, Comprehensive Automobile Liability, and Employers Liability.

1.25.5 Automobile Liability: Combined Single Limit - Bodily injury and property damage. All owned, non-owned, and hired vehicles. $1,000,000

1.25.6 The Contractual Liability coverage shall provide coverage for not less than

$1,000,000 for bodily injury for each person and each accident.

1.25.7 The Contractual Liability coverage shall provide coverage for not less than $1,000,000 for property damage for each accident and annual aggregate.

1.25.8 Responsible Party shall be included as additional insured. This coverage shall be primary and noncontributory.

2. CLEANING

2.1 Contractor shall provide labor, materials, equipment and services to clean the basement ceiling (Overview Figure Areas C, D and F) and joists (Overview Figure Areas A, B, E and H) and the first-floor ceiling (Overview Figure Areas A, B, C, D, E, F and H), joists (Overview Figure Areas A, B, C, D, E, F and H) and floor joists (Overview Figure Areas A, B, E and H) to remove loose particles prior to sealing.

2.2 After cleaning, the surfaces of the basement ceiling and joists and the first-floor ceiling, joists and floor joists shall be ready for the application of the Sika Corporation Sikagard 62 in Oxford Grey.

2.3 Cleaning method or methods shall be chosen by Contractor.

2.4 Cleaning shall be paid for on a Lump Sum basis under Bid Items 2 and 3. If multiple methods are proposed, Bidder shall include the costs of all methods in Bid Items 2 and 3.

2.5 Contractor shall provide, erect, maintain and later remove any dust control measures as necessary to avoid the spreading of contaminated dust throughout the building during the cleaning process.

2.6 Particles/solids generated during the cleaning process shall be placed into labeled 55-gallon drums for later analysis and disposal.

2.7 Liquids generated during the cleaning process shall be placed into labeled 55-gallon drums for later analysis and disposal.

2.8 Other potentially contaminated materials (e.g. protective clothing, broom, brushes, etc.) generated during the cleaning process shall be placed into labeled 55-gallon drums for later analysis and disposal.

2.9 Engineer shall collect samples of the particulates and the liquids for laboratory analyses of polynuclear aromatic hydrocarbons (PAHs; EPA Method 8270D), polychlorinated biphenyls (PCBs; EPA Method 8082A), and lead (EPA Method 6010C) to determine disposal method.

2.10 Contractor shall be responsible for paying the disposal fees for the disposal of the particulates, liquid and other potentially contaminated materials (e.g. protective clothing, broom, brushes, etc.).

3. REMOVAL OF THE EXISTING HARDENED TAR-LIKE SUBSTANCE

3.1 Contractor shall provide labor, materials, equipment and services to remove the existing hardened tar-like substance from the concrete flooring from the first-floor concrete floor in Overview Figure Area G.

3.2 Contractor shall remove the existing hardened tar-like substance from the concrete flooring from the first-floor concrete floor in Overview Figure Area G.

3.3 Particles/solids generated during the removal of the tar-like substance shall be placed into labeled 55-gallon drum(s) for later analysis and disposal.

3.4 Liquids generated during the removal of the tar-like substance shall be placed into labeled 55-gallon drums for later analysis and disposal.

3.5 Other potentially contaminated materials generated during the removal of the tar-like substance (e.g. protective clothing, broom, brushes, etc.) shall be placed into labeled 55-gallon drums for later analysis and disposal.

3.6 Engineer shall collect samples of the particulates and liquids for laboratory analyses of PAHs (EPA Method 8270D), PCBs (EPA Method 8082A), and lead (EPA Method 6010C) to determine disposal method.

3.7 Contractor shall be responsible for paying the disposal fees for the disposal of the particulates, liquid and other potentially contaminated materials.

4. SEAL SURFACES

4.1 Contractor shall provide labor, materials, equipment and services to seal the basement ceiling (Overview Figure Areas C, D and F) and joists (Overview Figure Areas A, B, E and H) and the first-floor ceiling (Overview Figure Areas A, B, C, D, E, F and H), joists (Overview Figure Areas A, B, C, D, E, F and H) and floor joists (Overview Figure Areas A, B, E and H) surfaces.

4.2 Contractor shall protect and dry the sealant coatings; protecting traffic and property upon and in the vicinity of the sealant application; and protect all portions of the building not identified as part of this Work from disfigurement by sealant application.

4.3 Approved sealant is Sika Corporations Sikagard 62 in Oxford Grey.

4.4 Sealant shall be applied per manufacturer's recommendations. Sealant shall be applied at a sufficient thickness to form a cohesive barrier over the basement ceiling and basement joists and the first-floor ceiling, joists and first-floor floor joists surfaces.

4.5 All visible sides of the basement ceiling, basement joists, first-floor ceiling, joists and first-floor floor joists surfaces shall be sealed.

4.6 Contractor shall apply sealant in a neat and skillful manner. Apply the coating smoothly and uniformly so no excess sealant collects at any point. Provide a finished surface free of streaks, pitting, wrinkling, or other irregularities.

4.7 If applying sealant with spray equipment, Contractor shall immediately brush it smooth, if necessary, to provide uniform coverage and to eliminate wrinkling, blistering, and air holes.

4.8 Sealant shall be free of coarse particles, skins, or other foreign materials detrimental to the application or appearance of the material.

4.9 If **recommended by the manufacturer**, a second coat shall be applied of the sealant. Costs for a second coat (including labor, materials, equipment and services) shall be included in Bid Items 5, 6 and 7.

4.10 If needed, Contractor shall apply supplemental sealant to areas impacted by work of Others.

4.11 Contractor shall assume that no more than 3% of the total area sealed shall require supplemental sealing to areas impacted by construction work.

4.12 Contractor shall assume that all supplemental sealing will be applied during one mobilization.

4.13 All supplemental sealing shall be applied by December 31, 2019.

4.14 All costs for supplemental sealing including labor, materials, equipment, services and mobilization shall be included in Bid Item 8.

5. SEALANT SURFACE SAMPLING

5.1 One month following sealant application, Engineer shall take wipe samples on the sealed surfaces and submit the samples for laboratory analysis of PCBs, lead, and PAHs.

5.2 Areas receiving supplemental sealant shall not be sampled.

5.3 Lead analytical results shall be compared to the U.S. Department of Housing and Urban Development clearance lead concentration of 40 micrograms per square foot (40 ug/ft^2)

"*Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Office of Healthy Homes and Lead Hazard Control*," Second Edition, July 2012.

5.4 PCBs analytical results shall be compared to the MPCA guidance of 10 micrograms per 100 square centimeters (10 ug/100 cm^2) total PCBs per "*Responding to PCB Leaks and Spills, Guidance for responding to PCB leaks and spills in Minnesota*," March 2012, w-hw4-48g.

5.5 The PAHs analytical results shall be evaluated for the presence/absence of PAHs.

5.6 Surfaces with lead analytical results greater than 40 ug/ft^2; PCBs analytical results greater than 10 ug/100 cm^2; and/or analytical results with PAHs present shall be re-sealed at no additional cost to the Responsible Party.

6 DISPOSAL

6.1 Engineer shall evaluate the laboratory analytical results and determine if the liquids and the solids/settled particulates are normal waste, special waste and/or hazardous waste.

6.2 Analytical results show that the liquids and/or the solids/particulates are normal waste.

6.2.1 If both the liquids and the solids/particulates are normal waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as normal waste.

6.2.2 Contractor shall load, haul and dispose of the liquids, the solids/particulates, protective clothing, brushes, etc. as normal waste.

6.2.3 Contractor shall dispose of the liquids, the solids/particulates, protective clothing, brushes, etc. at no additional cost to the Responsible Party.

6.3 Analytical results show that the liquids and/or the solids/particulates are special waste.

6.3.1 If both the liquids and the solids/particulates are special waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as special waste.

6.3.2 If either the liquids or the solids/particulates is special waste and the other is normal waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as special waste.

6.3.3 Contractor shall be responsible for completing the required disposal application (including waste profile sheets if needed) as well as the Dakota County permit disposal approval form (if needed). Cost to complete the disposal application and/or Dakota County form shall be included in Bid Item 9 and/or Bid Item 11.

6.3.4 A copy of the landfill approval at a MPCA-approved waste disposal facility shall be submitted to the Responsible Party and Engineer prior to disposal.

6.3.5 Contractor shall load, haul and dispose of the liquids and/or the solids/particulates.

6.3.6 Cost to load, haul and dispose of the liquids and/or the solids/particulates as special waste shall be included in Bid Item 9 and/or Bid Item 11.

6.3.7 Cost to load, haul and dispose of protective clothing, brushes, etc. as special waste shall be included in Bid Item 9.

6.3.8 Contractor shall pay disposal costs

6.4 Analytical results show that the liquids and/or the solids/particulates are hazardous waste.

6.4.1 If both the liquids and the solids/particulates are hazardous waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as special waste.

6.4.2 If either the liquids or the solids/particulates is hazardous waste and the other is normal waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as hazardous waste.

6.4.3 If either the liquids or the solids/particulates is hazardous waste and the other is special waste, the other potentially contaminated materials (e.g. protective clothing, brushes, etc.) shall be treated as hazardous waste.

6.4.4 Contractor shall be responsible for completing the required disposal application (including waste profile sheets if needed) as well as the Dakota County permit disposal approval form (if needed). Cost to complete the disposal application and/or Dakota County form shall be included in Bid Item 10 and/or Bid Item 12.

6.4.5 A copy of the landfill approval at a MPCA-approved waste disposal facility shall be submitted to the Responsible Party and Engineer prior to disposal.

6.5 Contractor shall load, haul and dispose of the liquids, the solids/particulates and the protective clothing, brushes, etc.

6.6 Cost to load, haul and dispose of the liquids and/or the solids/particulates/protective clothing, brushes, etc. as special waste shall be included in Bid Item 9 and/or Bid Item 11

6.7 Cost to load, haul and dispose of the liquids and/or the solids/particulates/protective clothing, brushes, etc. as hazardous waste shall be included in Bid Item 10 and/or Bid Item 12.

6.8 Contractor shall pay all disposal costs.

7 PAYMENT

7.1 Fifteen percent of the Total Bid Cost shall be retained by the Responsible Party until Contractor has completed any required re-sealant application as outlined in Section 5.

7.2 **For all items not bid on a lump sum (LS) basis, quantities shown on the Bid Response Form are estimates only**.

7.3 For items bid on a pound (LB) or gallon (GAL) basis, payment shall be based on **actual quantities** disposed of as documented through waste disposal manifests or other reliable and verifiable means.

7.4 As the Contractor shall be selecting the method(s) to clean the basement ceiling and joists (Overview Figure Areas C, D and F), the first-floor ceiling and joists (Overview Figure Areas A, B, C, D, E, F and H) and the first-floor floor joists (Overview Figure Areas A, B, E and H), the Responsible Party reserves the right to renegotiate the disposal costs should the actual quantities generated be more than or equal to double the estimated quantities.

END

FIGURES

N

0 100 200
Horizontal Scale In Feet

APPROXIMATE PROPERTY BOUNDARIES

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PROJECT LOCATION

ENCAPSULATION PROJECT
HASTINGS ECONOMIC DEVELOPMENT AND REDEVELOPMENT AUTHORITY
HASTINGS, MINNESOTA

DATE OF ISSUANCE
6/30/2016

NO	REVISION	DATE
1	ADDENDUM 1	2/1/16

SURVEY	
DRAWN	EJM
DESIGNED	EJM
CHECKED	RJB
APPROVED	HAW
PROJ. NO.	193704121

SHEET NUMBER
FIGURE 1

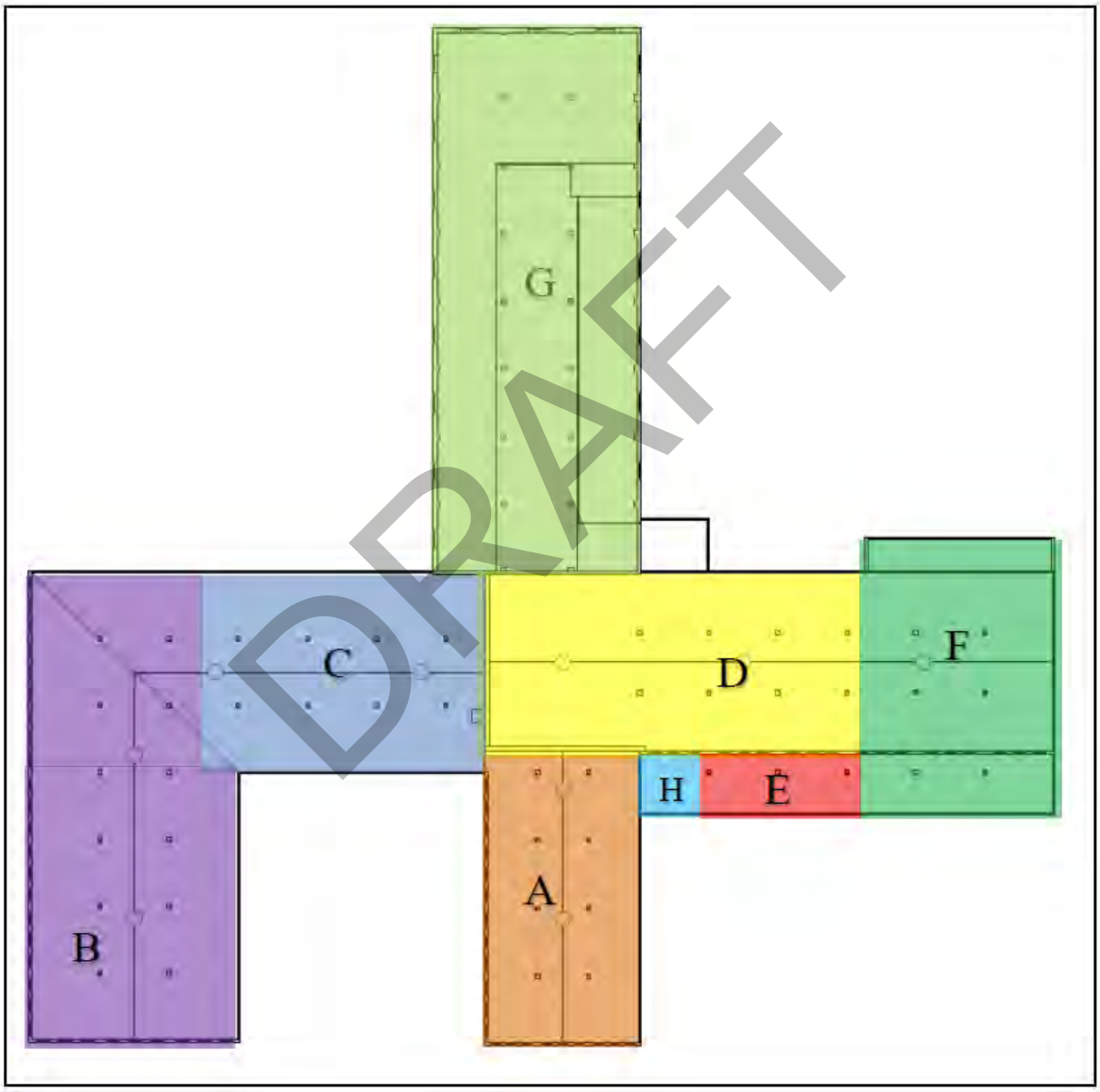
Overview Figure

Encapsulation Project

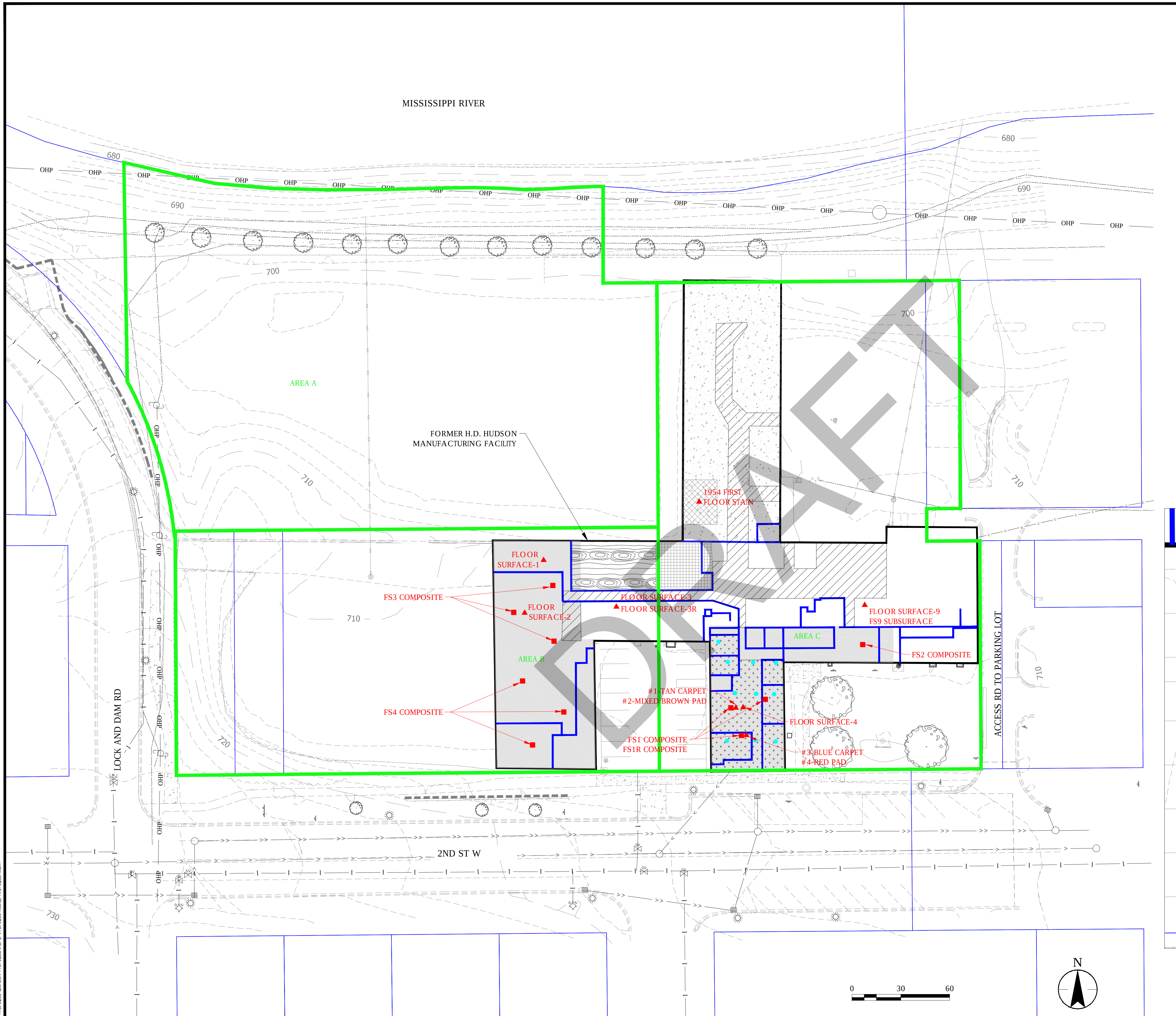
Former H.D. Hudson Manufacturing Facility

Hastings Economic Development and Redevelopment Authority

Hastings, MN



ATTACHMENT A

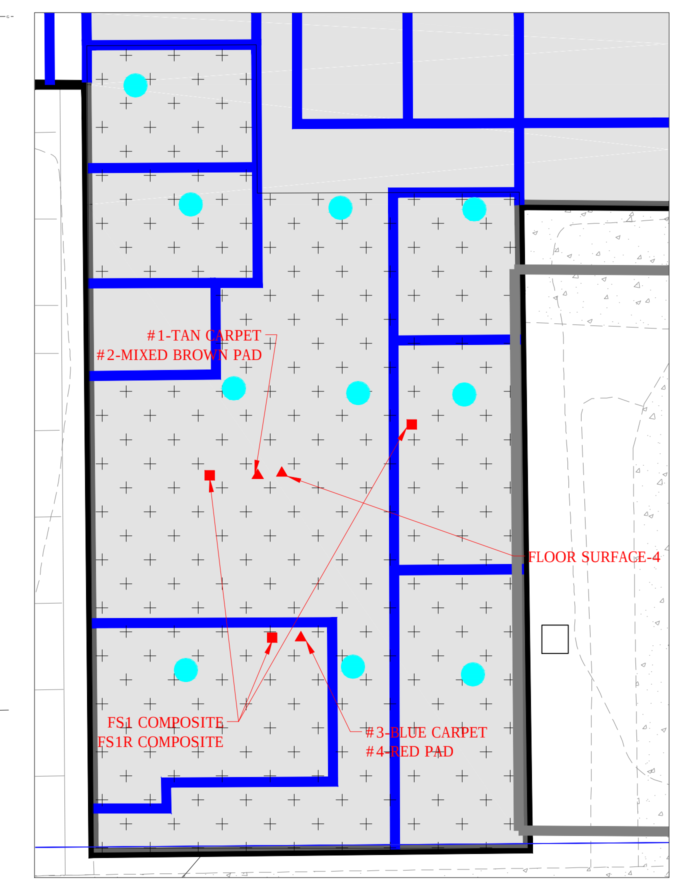


LEGEND

- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- EPA GRANT BOUNDARIES
- DAKOTA COUNTY PARCELS (2013)
- FLOOR SURFACE-1 — SAMPLE LOCATION AND DESIGNATION
- FS1 COMPOSITE — COMPOSITE SAMPLE AREAS AND DESIGNATION
- OFFICE CARPET AND OFFICE PADDING COMPOSITE SAMPLE APPROXIMATE LOCATIONS
- EXTERIOR BUILDING WALLS
- APPROXIMATE INTERIOR BUILDING WALLS
- APPROXIMATE LOCATION OF FIRST FLOOR FLOORING TO BE REMOVED AND DISPOSED OFFSITE (ABOVE CRAWL SPACES)
- APPROXIMATE EXISTING CONCRETE FLOOR STRUCTURE
- APPROXIMATE EXISTING STEEL PLATES OVER FLOOR
- APPROXIMATE EXISTING PLYWOOD OVER FLOOR
- APPROXIMATE EXISTING TILE OVER FLOOR
- APPROXIMATE FLOOR STAIN
- APPROXIMATE EXISTING CARPET

NOTES:

1. EXISTING FLOOR IS WOOD FLOOR ON WOOD JOISTS UNLESS DEPICTED OTHERWISE.
2. FLOOR LAYOUT HAS BEEN UPDATED BASED ON ACTUAL FIELD MEASUREMENTS



ENLARGEMENT OF APPROXIMATE EXISTING CARPET AREA C

0 10 20

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FIRST FLOOR SAMPLES

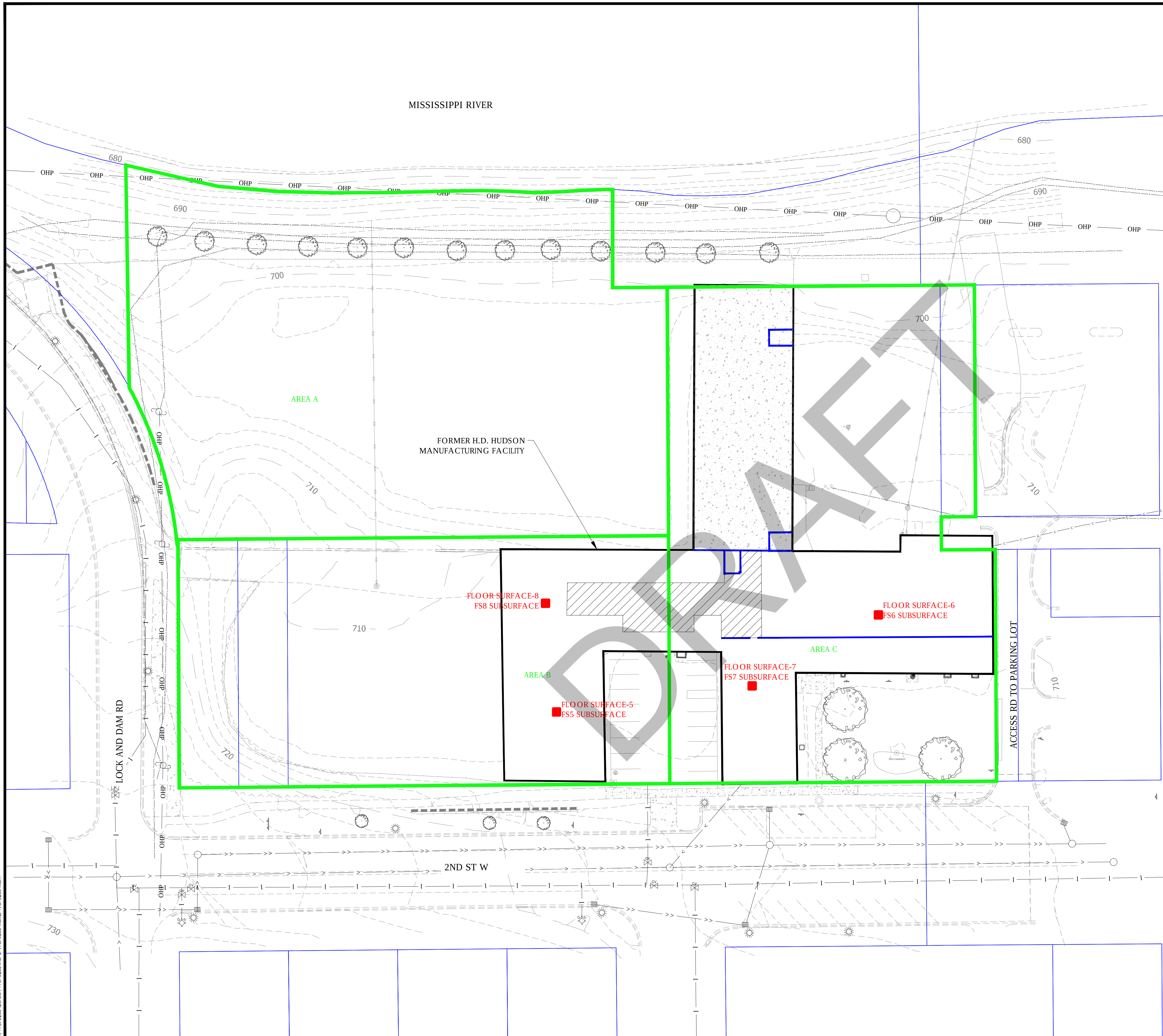
FLOORING MANAGEMENT AND ABATEMENT WORK PLAN
HASTINGS ECONOMIC DEVELOPMENT AND REDEVELOPMENT AUTHORITY
HASTINGS, MINNESOTA

DATE OF ISSUANCE 6/30/2016

NO	REVISION	DATE

SURVEY	
DRAWN	EJM
DESIGNED	EJM
CHECKED	RJB
APPROVED	HAW
PROJ. NO.	193704121

SHEET NUMBER
FIGURE 2



LEGEND

- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- EPA GRANT BOUNDARIES
- DAKOTA COUNTY PARCELS (2013)
- FS5 — COMPOSITE SAMPLE AREAS AND DESIGNATION
- EXTERIOR BUILDING WALLS
- APPROXIMATE LOCATION OF INTERIOR BUILDING WALLS
- APPROXIMATE LOCATION OF EXISTING CONCRETE FLOOR STRUCTURE
- APPROXIMATE LOCATION OF EXISTING STEEL PLATES OVER FLOOR

NOTES:

1. EXISTING FLOOR SHOULD BE CONSIDERED WOOD FLOOR ON WOOD JOISTS UNLESS DEPICTED OTHERWISE.
2. FLOOR LAYOUT HAS BEEN UPDATED BASED ON ACTUAL FIELD MEASUREMENTS.

0 30 60

N

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SECOND FLOOR SAMPLES

FLOORING MANAGEMENT AND ABATEMENT WORK PLAN
HASTINGS ECONOMIC DEVELOPMENT AND REDEVELOPMENT AUTHORITY
HASTINGS, MINNESOTA

DATE OF ISSUANCE
6/30/2016

NO	REVISION	DATE

SURVEY	
DRAWN	EJM
DESIGNED	EJM
CHECKED	RJB
APPROVED	HAW
PROJ. NO.	193704121

SHEET NUMBER
FIGURE 3

TABLE 1 - LABORATORY DATA
FLOORING MANAGEMENT AND ABATEMENT WORK PLAN
FORMER H.D. HUDSON MANUFACTURING FACILITY PROPERTY, HASTINGS, MN

Borehole Number	1st or 2nd Floor	Remove or Remain	Area B or Area C	Date	GRO/DRO (mg/kg)		Volatile Organic Compounds (ug/kg or ppb)																				
					Gasoline Range Organics	Diesel Range Organics	Trichloroethene	1,1,1-Trichloroethane	1,1 - Dichloroethane	1,1-Dichloroethylene	cis-1,2-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	Benzene	Ethylbenzene	Methyl Ethyl Ketone	Methyl Isobutyl Ketone	Naphthalene	n-Propylbenzene	p-Isopropyltoluene	Tetrachloroethylene	Tetrahydrofuran	Toluene	Xylene (Total)	Xylene M&P	Xylene - o
TCLP					NE		500	NE	NE	700	NE	NE	NE	NE	500	NE	200,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
20 x TCLP					NE		10,000	NE	NE	14,000	NE	NE	NE	NE	10,000	NE	4,000,000	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
FLOOR SURFACE-1	1st Floor	Remove	Area B	12/07/15	-	**52000**	<200	290	<200	<200	<200	<200	<200	<100	<200	<200	<200	<200	<510	<200	<200	<200	<100	<200	<200	<410	<200
FLOOR SURFACE-2				12/07/15	-	**25000**	<250	<250	<250	<250	<250	<250	<250	<120	<250	<250	<250	<250	<620	<250	<250	<250	<120	<250	<500	<500	<250
FS3 Composite				03/15/16	-	**10000**	<780	<780	<780	<780	<780	1200	<780	<3900	<780	<780	<780	<780	<1900	<780	3400	<780	<3900	<780	<2380	<1600	<780
FS4 Composite				03/15/16	-	**42000**	<800	<800	<800	<800	<800	<800	<800	<4000	<800	<800	<800	<800	<2000	<800	1700	<800	<4000	<800	<2400	<1600	<800
FLOOR SURFACE-3	1st Floor	Remain		12/07/15	-	**9200**	<230	<230	<230	<230	<230	<230	<230	<120	<230	<230	<230	<230	<580	<230	<230	<230	<120	590	<230	<470	<230
FLOOR SURFACE-3R				01/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLOOR SURFACE-5	2nd Floor	Remain		01/13/16	-	**48000**	<1300	<1300	<1300	<1300	<1300	1600	<1300	<6500	<1300	<1300	<6500	2200	<3300	<1300	<1300	<1300	<6500	<1300	-	-	<1300
FS5 Subsurface				04/12/16	-	**83000**	<760	<760	<760	<760	<760	10000	2700	<3800	<760	1000	<380	13000	13000	1100	1900	<760	<3800	3100	-	-	2700
FLOOR SURFACE-8				01/14/16	-	**21000**	<1400	<1400	<1400	<1400	<1400	<1400	<1400	<6800	<1400	<1400	<6800	<1400	<3400	<1400	<1400	<1400	<6800	<1400	-	-	<1400
FS8 Subsurface				04/12/16	-	**23000**	<790	<790	<790	<790	<790	2500	<790	<4000	<790	<790	<400	1800	2300	<790	2400	<790	<4000	1100	-	-	1100
FLOOR SURFACE-4	1st Floor	Remove	Area C	01/14/16	-	**13000**	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<6700	<1300	<1300	<6700	<1300	<3300	<1300	<1300	<1300	<6700	<1300	-	-	<1300
FS1 Composite				03/10/16	-	**8700**	<820	<820	<820	<820	<820	<820	<820	<4100	<820	<820	<820	<820	<2000	<820	<820	<820	<4100	<820	<2420	<1600	<820
FS1R Composite				04/20/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FS2 Composite				03/10/16	-	**2100**	<760	<760	<760	<760	<760	<760	<760	<3800	<760	<760	<760	<760	<1900	<760	<760	<760	<3800	<760	<2260	<1500	<760
#1 - Tan Carpet				04/08/16	-	**4400**	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<8000	<1600	<1600	<8000	<1600	<4000	<1600	<1600	<1600	<8000	<1600	-	-	<1600
#2 - Mixed Brown Pad				04/08/16	-	**45000**	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<7900	<1600	<1600	<7900	<1600	<4000	<1600	<1600	<1600	<7900	<1600	-	-	<1600
#3 - Blue Carpet				04/08/16	-	**3500**	<1500	<1500	<1500	<1500	<1500	<1500	<1500	<7600	<1500	<1500	<7600	<1500	<3800	<1500	<1500	<1500	<7600	<1500	-	-	<1500
#4 - Red Pad				04/08/16	-	**30000**	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<8000	<1600	<1600	<8000	<1600	<4000	<1600	<1600	<1600	<8000	<1600	-	-	<1600
Office Carpet*				06/02/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Padding*				06/02/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLOOR SURFACE-9	1st Floor	Remain		01/14/16	-	**5100**	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<6600	<1300	<1300	<6600	<1300	<3300	<1300	<1300	<1300	<6600	<1300	-	-	<13100
FS9 Subsurface				04/13/16	-	**5600**	<790	<790	<790	<790	<790	1700	<790	<3900	<7900	<790	<3900	<790	3700	<790	1100	<790	<3900	<790	-	-	<790
1954 First Floor Stain				04/28/16	-	**42000**	<210	<210	<210	<210	<210	<210	<210	<1000	<210	<210	<1000	<210	<520	<210	<210	<210	<1000	<210	-	-	<210
FLOOR SURFACE-6	2nd Floor	Remain		01/13/16	-	**23000**	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<6300	<1300	<1300	<6300	<1300	<3200	<1300	<1300	<1300	<6300	<1300	-	-	<1300
FS6 Subsurface				04/13/16	-	**8100**	<800	<800	<800	<800	<800	<800	<800	<4000	<800	<800	<400	<800	3200	<800	1300	<800	<4000	1100	-	-	<800
FLOOR SURFACE-7				01/14/16	-	**11000**	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<6300	<1300	<1300	<6300	<1300	<3200	<1300	<1300	<1300	<6300	<1300	-	-	<1300
FS7 Subsurface				04/12/16	-	**3000**	<800	<800	<800	<800	<800	<2000	<800	<4000	<800	<800	<400	<800	<2000	<800	1300	<800	<4000	<800	-	-	<800

Note: Only analytes detected in at least one sample are summarized on this table

- = Not analyzed
DRO = diesel range organic
GRO = gasoline range organic
ND = not detected (analyte concentration is below reportable detection limit)
NE = not established
PCB = polychlorinated biphenyl

mg/kg = milligrams per kilogram
mg/L = milligrams per liter
ug/kg = micrograms per kilogram

* Analyzed for VOC's and RCRA Metals using TCLP Method
No VOCs were Detected and as such, not presented on the table

XXX = designates concentrations that exceed Petroleum Remediation Guideline Criteria
= designates exceedances associated with on-site samples
= designates exceedances > 20 x TCLP

TABLE 1 - LABORATORY DATA
FLOORING MANAGEMENT AND ABATEMENT WORK PLAN
FORMER H.D. HUDSON MANUFACTURING FACILITY PROPERTY, HASTINGS, MN

Borehole Number	1st or 2nd Floor	Remove or Remain	Area B or Area C	Date	Metals and Cyanides (mg/kg or ppm)										TCLP Metals (mg/L or ppm)					Polynuclear Aromatic Hydrocarbons (ug/kg or ppb)															PCBs (ug/kg or
					Antimony	Arsenic	Barium	Berryllium	Cadmium	Chromium (Total)	Lead	Mercury	Selenium	Silver	Lead	Barium	Cadmium	Chromium	Mercury	Anthracene	Acenaphthylene	BaP Equivalent	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Phenanthrene	Pyrene	Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268
				TCLP	NE	5	100	NE	1	5	5	0.2	1	5	5	100	1	2	0.2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
				20 x TCLP	NE	100	2,000	NE	20	100	100	4	20	100	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
FLOOR SURFACE-1				12/07/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<23000	<23000	-	<23000	<23000	<23000	<23000	<23000	<23000	<23000	<23000	<23000	<23000	<23000	<23000	All ND
FLOOR SURFACE-2				12/07/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<22000	<22000	-	<22000	<22000	<22000	<22000	<22000	<22000	<22000	<22000	<22000	<22000	<22000	<22000	All ND
FS3 Composite	1st Floor	Remove		03/15/16	-	<1.0	32	-	0.58	5.3	74	<0.50	<2.5	<0.50	-	-	-	-	-	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	2300	<1600	13000	<1600	<1600	25000	7000	All ND
FS4 Composite				03/15/16	-	<1.0	17	-	0.21	2.2	19	<0.50	<2.5	<0.50	-	-	-	-	-	<4500	<4500	<4500	<4500	<4500	<4500	<4500	<4500	<4500	<4500	<4500	4700	<4500	4700	7500	<4500	All ND
FLOOR SURFACE-3	1st Floor	Remain	Area B	12/07/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<24000	<24000	-	<24000	<24000	<24000	<24000	<24000	<24000	<24000	<24000	<24000	<24000	<24000	<24000	12000
FLOOR SURFACE-3R				01/13/16	-	7.2	330	-	11	600	2300	2.6	<2.5	2.4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14400
FLOOR SURFACE-5	2nd Floor	Remain		01/13/16	-	2.8	78	-	16	38	2000	6.1	<2.5	0.57	3.6	-	-	-	<0.05	<7100	<7100	-	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	<7100	3700
FS5 Subsurface				04/12/16	-	<1.0	13	-	0.31	0.96	200	<0.50	<2.5	<0.50						<16000	<16000	-	<16000	<16000	<16000	<16000	<16000	<16000	<16000	<16000	<16000	<16000	<16000	17000	<16000	<1500
FLOOR SURFACE-8				01/14/16	-	1.6	160	-	13	70	1300	8.5	<2.5	0.92	6.2	-	-	-	<0.05	<2600	<2600	-	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	<2600	6500
FS8 Subsurface				04/12/16	-	<1.0	27	-	1.4	5.2	150	0.55	<2.5	<0.50						<660	<660	-	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	600
FLOOR SURFACE-4				01/14/16	-	8.5	280	-	61	45	4200	1.9	<2.5	3.3	46	-	-	-	-	<7200	<7200	-	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	<7200	All ND
FS1 Composite				03/10/16	-	<1.0	51	-	2.3	3.6	79	<0.50	<2.5	<0.50	-	-	-	-	-	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	All ND
FS1R Composite				04/20/16	-	-	-	-	-	-	-	-	-	-	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FS2 Composite				03/10/16	-	2.4	19	-	0.14	<0.50	22	<0.50	<2.5	<0.50	-	-	-	-	-	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	All ND
#1 - Tan Carpet				04/08/16	-	2.4	20	-	1.8	5.4	190	<0.50	<2.5	<0.50	8.2	-	-	-	-	<1700	<1700	-	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<340
#2 - Mixed Brown Pad	1st Floor	Remove		04/08/16	-	2.0	4,300	-	1.2	4.2	83	<0.50	<2.5	<0.50	-	0.5	-	-	-	<7900	<7900	-	<7900	<7900	<7900	<7900	<7900	8400	<7900	<7900	<7900	<7900	15000	<7900	<1200
#3 - Blue Carpet				04/08/16	-	17	5.8	-	0.5	4	18	<0.50	<2.5	<0.50	-	-	-	-	-	<830	<830	-	<830	<830	<830	<830	<830	<830	<830	<830	<830	<830	<830	<830	<830	<430
#4 - Red Pad				04/08/16	-	5.5	930	-	28	46	630	0.97	<2.5	0.77	16	-	2.4	-	-	<8000	<8000	-	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<8000	<3600
Office Carpet*				06/02/16	-	-	-	-	-	-	-	-	-	-	1.83	<0.50	0.11	0.037	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Padding*				06/02/16	-	-	-	-	-	-	-	-	-	-	0.412	<0.50	<0.02	0.232	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLOOR SURFACE-9	1st Floor	Remain		01/14/16	-	2.5	63	-	57	26	560	<0.50	<2.5	1.1	5.8	-	-	-	-	<2800	<2800	-	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	850
FS9 Subsurface				04/13/16	-	3.3	29	-	4.2	4.2	48	<0.50	<2.5	<0.50						<1300	<1300	-	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	<1300	600
1954 First Floor Stain				04/28/16	-	2.6	96	-	1.8	80	260	<0.52	<2.6	<0.52						<8700	<8700	-	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<8700	<4200
FLOOR SURFACE-6	2nd Floor	Remain		01/13/16	-	4.1	130	-	28	200	1400	3.1	<2.5	3.6	11	-	-	-	-	<6500	<6500	-	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	<6500	4700
FS6 Subsurface				04/13/16	-	<1.0	61	-	1.9	4.2	160	<0.50	<2.5	<0.50						<1300	<1300	-	<1300	<1300	<1300	<1300	<1300	1600	<1300	4600	<1300	<1300	4600	3500	<1200
FLOOR SURFACE-7				01/14/16	-	4.9	160	-	26	100	1000	2.1	<2.5	1.1	4.3	-	-	-	-	<2800	<2800	-	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	<2800	1200
FS7 Subsurface				04/12/16	-	<1.0	24	-	1.7	0.74	50	<0.50	<2.5	<0.50						<660	<660	-	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	<660	600

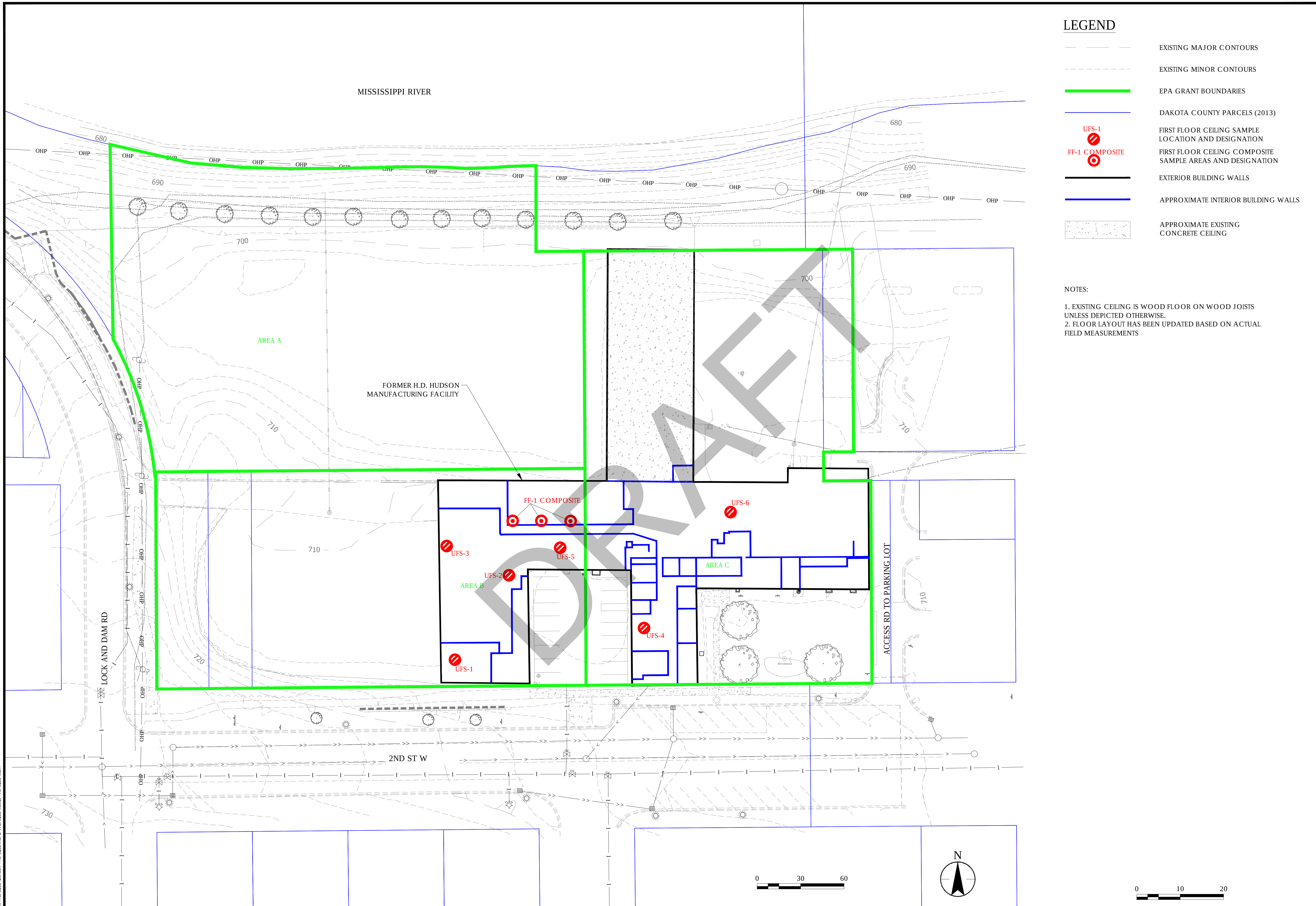
Note: Only analytes detecte
in at least one sample are
summarized on this table

- = Not analyzed
DRO = diesel range organic
GRO = gasoline range organic
ND = not detected (analyte concentration is below reportable detection limit)
NE = not established
PCB = polychlorinated biphenyl

mg/kg = milligrams per kilogram
mg/L = milligrams per liter
ug/kg = micrograms per kilogram

* Analyzed for VOC's and RCRA Metals using TCLP Method
No VOCs were Detected and as such, not presented on the table

XXX = designates concentrations that exceed Petroleum Remediation Guideline Criteria
= designates exceedances associated with on-site samples
= designates exceedances > 20 x TCLP



Stantec
12075 N. Corporate Parkway, Suite 200
Mequon, WI 53092
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FIRST FLOOR CEILING SAMPLES

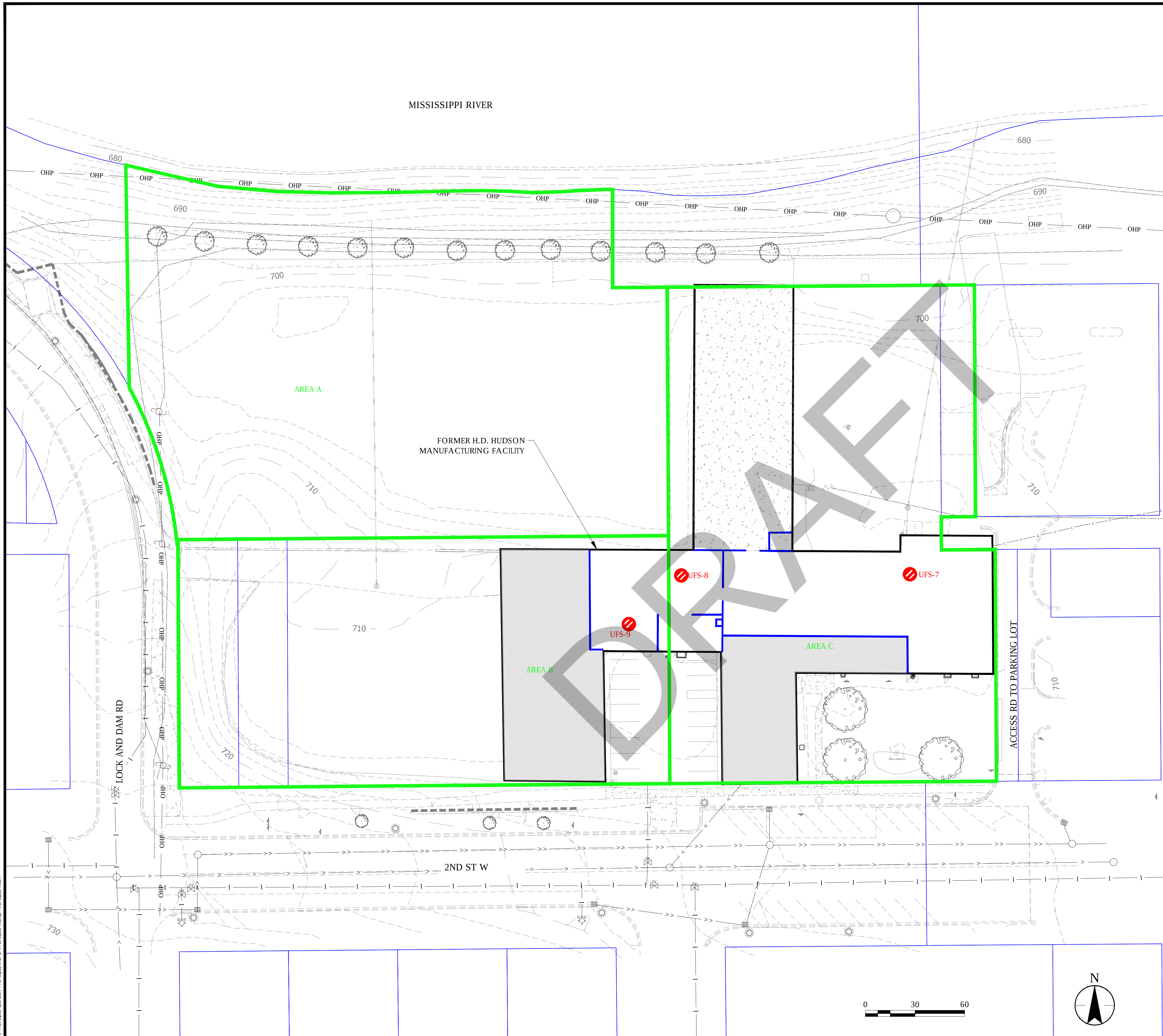
FLOORING MANAGEMENT AND ABATEMENT WORK PLAN ADDENDUM
HASTINGS ECONOMIC DEVELOPMENT AND REDEVELOPMENT AUTHORITY
HASTINGS, MINNESOTA

DATE OF ISSUANCE	
2/03/2017	

NO	REVISION	DATE

SURVEY	
DRAWN	EJM
DESIGNED	EJM
CHECKED	RJB
APPROVED	HAW
PROJ. NO.	193704121

SHEET NUMBER
FIGURE 2



LEGEND

- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- EPA GRANT BOUNDARIES
- DAKOTA COUNTY PARCELS (2013)
- UFS-9 — BASEMENT CEILING SAMPLE LOCATION AND DESIGNATION
- EXTERIOR BUILDING WALLS
- APPROXIMATE INTERIOR BUILDING WALLS
- APPROXIMATE LOCATION OF CRAWL SPACE
- APPROXIMATE EXISTING CONCRETE CEILING

NOTES:

1. EXISTING CEILING IS WOOD FLOOR ON WOOD JOISTS UNLESS DEPICTED OTHERWISE.
2. FLOOR LAYOUT HAS BEEN UPDATED BASED ON ACTUAL FIELD MEASUREMENTS

Stantec
12075 N. Corporate Parkway, Suite 200
Mequon, WI 53092
www.stantec.com

BASEMENT CEILING SAMPLES

FLOORING MANAGEMENT AND ABATEMENT WORK PLAN ADDENDUM
HASTINGS ECONOMIC DEVELOPMENT AND REDEVELOPMENT AUTHORITY
HASTINGS, MINNESOTA

DATE OF ISSUANCE
2/03/2017

NO	REVISION	DATE

SURVEY	
DRAWN	EJM
DESIGNED	EJM
CHECKED	RJB
APPROVED	HAW
PROJ. NO.	193704121

SHEET NUMBER
FIGURE 3

TABLE 1 - LABORATORY DATA
FLOORING MANAGEMENT AND ABATEMENT WORK PLAN ADDENDUM
FORMER H.D. HUDSON MANUFACTURING FACILITY PROPERTY, HASTINGS, MN

Sample Number	Floor	Remove or Remain	Area	Date	Metals and Cyanides (mg/kg or ppm)										Polynuclear Aromatic Hydrocarbons (ug/kg or ppb)														PCBs (ug/kg or ppb)
					Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (Total)	Lead	Mercury	Selenium	Silver	Anthracene	Acenaphthylene	BaP Equivalent	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Phenanthrene	Pyrene	Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268
				TCLP	NE	5	100	NE	1	5	5	0.2	1	5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
				20 x TCLP	NE	100	2,000	NE	20	100	100	4	20	100	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
FF-1	1st Floor	Remain	Ceiling Joist	01/13/17	-	-	-	-	-	-	65	-	-	-	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	<1600	All ND
UFS-1				01/13/17	-	-	-	-	-	-	220	-	-	-	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	<5900	All ND
UFS-2				01/13/17	-	-	-	-	-	-	340	-	-	-	<37000	<37000	<37000	<37000	<37000	<37000	<37000	<37000	<37000	<37000	<37000	<37000	39000	<37000	All ND
UFS-3				01/13/17	-	-	-	-	-	-	240	-	-	-	<13000	<13000	<13000	<13000	<13000	<13000	<13000	<13000	19000	<13000	<13000	<13000	<13000	<13000	All ND
UFS-4				01/13/17	-	-	-	-	-	-	22	-	-	-	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	2800	<2000	<2000	<2000	<2000	<2000	All ND
UFS-5				01/13/17	-	-	-	-	-	-	100	-	-	-	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	<0980	All ND
UFS-6				01/13/17	-	-	-	-	-	-	23	-	-	-	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	<14000	All ND
UFS-7	Basement	Remain	Ceiling Joist	01/13/17	-	-	-	-	-	-	24	-	-	-	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	All ND
UFS-8				01/13/17	-	-	-	-	-	-	28	-	-	-	<7000	<7000	<7000	<7000	<7000	<7000	<7000	<7000	7700	<7000	8100	<7000	<7000	13000	<7000	7400
UFS-9				01/13/17	-	-	-	-	-	-	46	-	-	-	<7600	<7600	<7600	<7600	<7600	<7600	<7600	<7600	8700	<7600	<7600	<7600	<7600	<7600	<7600	7500

Note: Only analytes detected in at least one sample are summarized on this table

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mg/L = milligrams per liter
ND = not detected (analyte concentration is below reportable detection limit)
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* Analyzed for VOC's and RCRA Metals using TCLP Method
No VOCs were Detected and as such, not presented on the table

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