

November 27, 2018
File No. 25211374.51

Ms. Cindy Koepke, PG, Hydrogeologist
Remediation & Redevelopment Program
Wisconsin Department of Natural Resources - South Central Region
3911 Fish Hatchery Road
Fitchburg, WI 53711

Subject: Summary of Pressure Field Extension Testing
Laundry Land Cleaners (former), Northgate Shopping Center
1131 N. Sherman Avenue, Madison, Wisconsin
WDNR BRRTS #02-13-552183

Dear Ms. Koepke:

On behalf of Northgate Partnership, SCS Engineers (SCS) is providing the following summary of sub-slab pressure field extension (PFE) testing for the Laundry Land Cleaners DERF site. The testing was conducted to evaluate sub-slab depressurization as a means of mitigating locations where sub-slab vapor sampling results indicate a potential for vapor intrusion.

The PFE testing indicated relatively poor vacuum distribution within the sub-slab, suggesting that sub-slab depressurization may not be a feasible or cost-effective form of mitigation for this facility. Based on these findings and other factors discussed below, SCS recommends additional evaluation to assess current sub-slab vapor concentrations and other potential mitigation options. If agreed, SCS will submit a scope of work and Change Order for the additional vapor assessment. Additional information regarding the PFE testing is provided below.

METHODS

The PFE testing was conducted by Acura Services, LLC (Acura) in July 2018 under the supervision of SCS. Acura's summary report is included in **Attachment A**. The PFE testing was conducted within seven units of the shopping center, including Dream Bikes, Boomerangs, CSN, Naly's Floral Shop, H & R Block, Falbo Brothers Pizza, and UPS Store units (**Figure 1**)

Vacuum test and observation points were installed in each unit by drilling 1-inch-diameter holes through the floor slab. Vapor sampling ports installed in 2012, 2015, and 2016 were also used as vacuum observation points where available.

A vacuum was applied to each test point using a wet-dry vacuum, and vacuum measurements were made at the surrounding vacuum observation points using a manometer. The vacuum at each observation point and the distance between the observation point and the test point were recorded for each test. The test points and observation points were abandoned by patching with concrete after the testing was completed.



FINDINGS

A limited radius of influence was observed during the PFE testing. Sub-slab vacuums ranged from 0.000 inches of water column (WC) to 0.062 inches WC with most readings being less than the 0.004 inches of WC specified in the Wisconsin Department of Natural Resources (WDNR) RR-800 guidance for commissioning of depressurization systems. These findings suggest a relatively impermeable sub-slab material or possible short circuiting of vacuum into more permeable sub-slab materials. The building foundation walls may also limit the extent of vacuum from one unit to the next. Based on the PFE testing, Acura indicates that the sub-slab depressurization zone is questionable at best, and they caution that pilot (fan) testing should be done before committing to a full-scale design.

Acura estimated a cost of \$51,575 to \$56,923 to construct the systems. These costs do not include construction oversight, documentation, operation and maintenance, or long-term monitoring costs associated with the systems.

CONCLUSIONS AND RECOMMENDATIONS

PFE test results suggest sub-slab depressurization may not be a feasible means of vapor mitigation. Even if full-scale systems are feasible, system costs are relatively high, and the excavation of numerous pick-up points, extensive piping runs, and long-term maintenance of the systems within active businesses will likely be disruptive.

Another factor to consider is that some of the shopping center units have been modified, tenants have changed, and remedial action (whey injections) has been performed since the initial vapor assessment sampling was performed. Due to these changes, sub-slab vapor concentrations may be different than those observed during prior vapor assessment sampling.

SCS recommends that additional vapor sampling be conducted and other means of vapor mitigation be evaluated based on the PFE test results, high system costs, disruption to tenants, and potential changes in sub-slab concentrations since the initial vapor assessment was performed. If the WDNR agrees, SCS will prepare a scope of work and Change Order for the additional vapor assessment.

Please contact us at 608-224-2830 if you have any questions concerning this letter.

Sincerely,



Robert Langdon
Senior Project Manager
SCS Engineers



Betty J. Socha, PhD, PG
Senior Project Manager
SCS Engineers

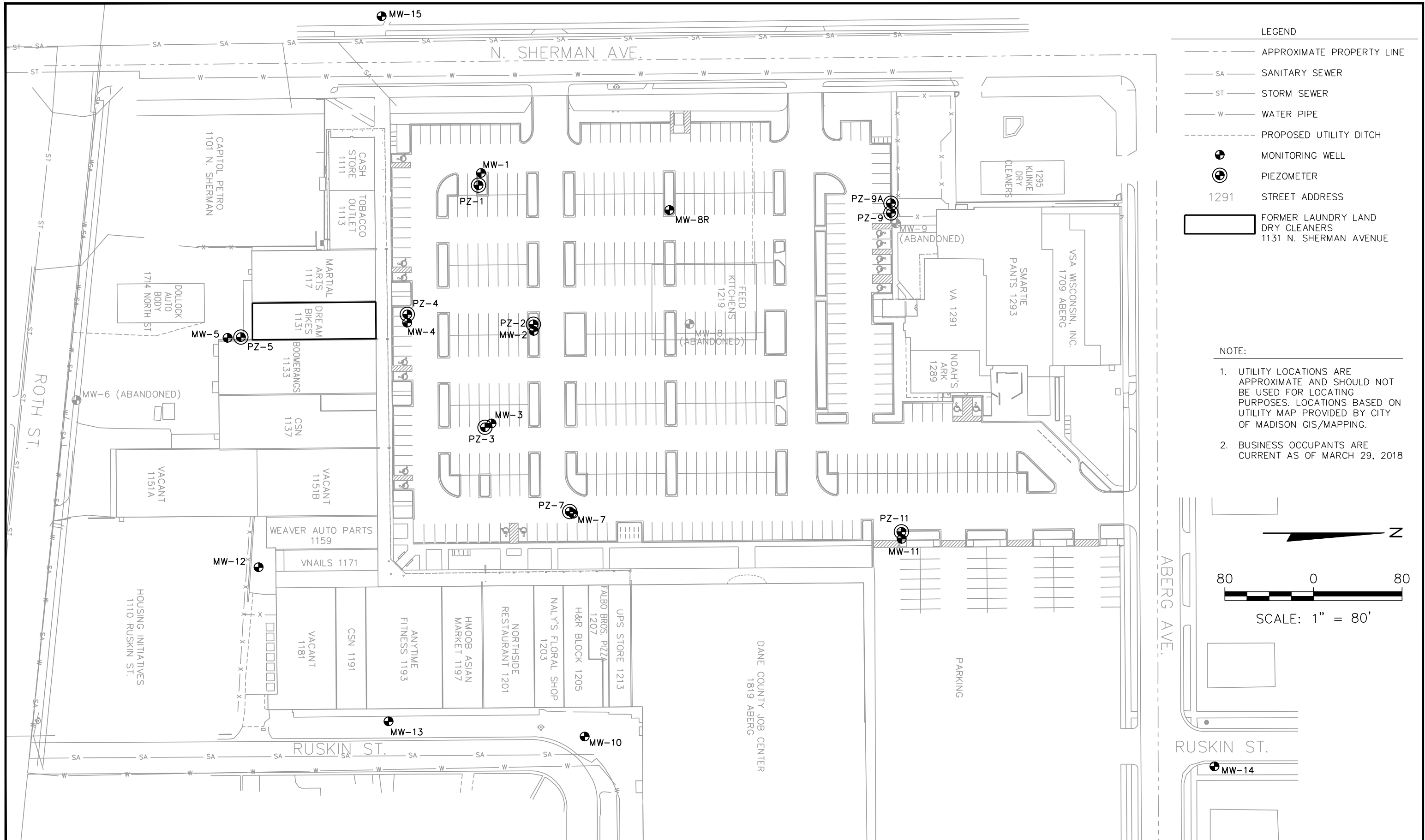
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cc: Paul Roth, Northgate Partnership
Maggie Mackey, 230 Brookdale Lane, Palatine, IL 60067

Attachments: Figure 1 – Site Map
Attachment A – July 28, 2018 Acura Services, LLC Report

Figure 1

Site Map

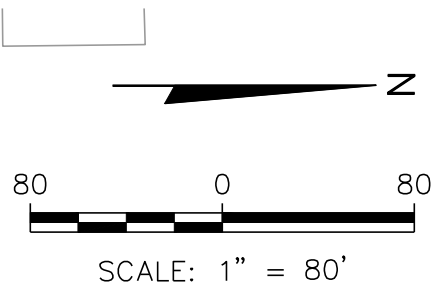


LEGEND


- APPROXIMATE PROPERTY LINE
- SA SANITARY SEWER
- ST STORM SEWER
- W WATER PIPE
- - - PROPOSED UTILITY DITCH
- ⊕ MONITORING WELL
- ⊕ (with circle) PIEZOMETER
- 1291 STREET ADDRESS
- ▭ FORMER LAUNDRY LAND
DRY CLEANERS
1131 N. SHERMAN AVENUE

NOTE:

1. UTILITY LOCATIONS ARE APPROXIMATE AND SHOULD NOT BE USED FOR LOCATING PURPOSES. LOCATIONS BASED ON UTILITY MAP PROVIDED BY CITY OF MADISON GIS/MAPPING.
2. BUSINESS OCCUPANTS ARE CURRENT AS OF MARCH 29, 2018



PROJECT NO. 25211374.50	DRAWN BY: BJM	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT NORTHGATE PARTNERSHIP 7625 BONETTI ROAD DANE, WI 53529	SITE NORTHGATE SHOPPING CENTER 1127 NORTH SHERMAN AVE. MADISON, WI	FIGURE 1
DRAWN: 08/25/16	CHECKED BY: BS				
REVISED: 06/28/18	APPROVED BY:				



Attachment A

July 28, 2018 Acura Services, LLC Report



Radon & Soil Vapor Mitigation Services

Anthony G. Hendricks P.E.

July 28, 2018

SCS Engineers
Betty J. Socha, PhD, PG
Senior Project Manager
2830 Dairy Drive
Madison, WI 53718-6751
(608) 216-7331

**Project: Northgate Shopping Center (Formerly Laundry Land Cleaners)
1131 N. Sherman Avenue, Madison, WI**

Communication (Connectivity) Testing & Design Mitigation Systems

Work Performed On Site July 26, 2018

Inspected the following building spaces at the Northgate Shopping Center (Formerly Laundry Land Cleaners) 1) Dream Bikes; 2) Boomerangs; 3) CSN 4) Naly's Floral; 5) H & R Block; 6) Falbo Brothers Pizza; 7) UPS Store and performed Vapor Mitigation Connectivity Testing.

Physical Description

- 1) **Dream Bikes:** Approximately 108 feet long by 29 feet wide, with a basement on the south side that is approximately 70 feet long by 16 feet wide. The area to be mitigated is the ground level floor only approximately 3,132 sq. feet.
- 2) **Boomerangs:** Approximately 140 feet long by 60 feet wide in the front and 46 feet wide in the back. (There's a jut out on the north-east side of 14 feet by 48 feet.) The area to be mitigated is approximately 7,120 sq. ft.
- 3) **CSN:** Approximately 140 feet long by 45 feet wide in the back (31 feet in the front). The area to be mitigated is approximately 5,628 sq. ft.
- 4) **Naly's Floral:** Approximately 100 feet long by 25 feet wide. The area to be mitigated is approximately 2,500 sq. ft.
- 5) **H & R Block:** Approximately 100 feet long by 22 feet in the front and 32 feet in the back. Approximately 2,697 sq. feet.
- 6) **Falbo Brothers Pizza:** Approximately 44 feet long by 18 feet wide in the front. In the back approximately 56 feet long by 8 feet wide. Approximately 1240 sq. ft.
- 7) **UPS Store:** Approximately 100 feet long by 20 feet wide. Approximately 2,000 sq. ft.

Northgate Shopping Center is angled with the parking lot filling in between the angle. Dream Bikes, Boomerangs and CSN are on the North Sherman Avenue side and are side by side. Naly's Floral, H & R Block, Falbo Brothers Pizza and UPS Store are on the Aberg Avenue end and are side by side.



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Communication Testing

In each space evaluated a search was made for existing vapor pins. The vapor pins if found were used to take depressurization readings with a micro manometer while vacuum was pulled on a one inch diameter hole through the concrete. In some of the areas the vapor pins could not be located. New flooring or carpeting may have been put down over them. In some areas there was so much stuff on the floor that vapor pins couldn't be located. During communication testing the bit occasional hit something hard below the floor level. Whether this is small stones, cobbles or rubble or something else is unknown.

- A) H & R Block: (No vapor pins were found. The carpet squares looked very new.)
Test Point A (located behind the door to the bathrooms 16 ft. from the back of the building.)
Test Point B (located near the water cooler in the conference room 23 ft, west of Test Point A.)
Test Point C (located 19 feet west of test point B along the same wall.)

Vac Test, Pt A to Pt. B (23 ft. approx.)	-0.062 inches WC
Vac Test, Pt 2 to Pt. 3 (19 ft. approx.)	-0.015 inches WC *
Vac Test, Pt. 3 to Pt. 2 (19 ft. approx.)	0.000 inches WC *

Note: * Vacuum pulled on Pt. 2 gave better results. Vacuum pulled on Pt. 3 demonstrated no connectivity. Sand fill observed at Pt. 2. Clay observed at Pt. 3.

- B) UPS Store: (Two vapor pins were located. One in the restroom and one near the front of the store behind the mail boxes.)
Test Point A (Located near the middle of the building near south wall)
Vapor Pin 1 (Located in the restroom toward the back of the building.)
Vapor Pin 2 (Located behind the mail boxes near the front of the store.)

Vac Test, A to VP 1 (28 ft. approx.)	-0.002 inches WC
Vac Test, A to VP 2 (45 ft. approx.)	0.000 inches WC

- C) Naly's Flora: (Located one vapor pin approx. 3 feet from back wall.)
Test Point A (Made in the restroom approx. 70 feet from the front)

Vac Test A to VP 1 (28 ft. approx.)	-0.002 inches WC
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- D) CSN: Located one vapor pin in closet at the back of the building, south-west corner.
Test Point A (Made approximately 28 feet east of the vapor pin, rear of building.)



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Vac Test A to VP 1 (28 ft. approx.) 0.000 inches WC

- E) Boomerangs: Located one vapor pin in utility area in the back near a work bench.
Test Point A (8 ft. from back door approx. 32 feet to the vapor pin)

Vac Test A to VP 1 (32 ft. approx.) 0.000 inches WC
Note: Large gap where floor and wall meet observed in utility area.

- F) Dream Bikes: Failed to locate any vapor pins.
Test Point A approx. 20 ft. from back wall, outside restrooms, 8.5 feet from east wall.
Test Point B approx. 25 ft. north of Test Point A. about 6 feet from the east wall.

Vac Test A to B (25 ft. approx.) 0.000 inches WC

The communication testing indicates that for the most part the sub slab soil is very tight, probably highly compacted clay like material. There was in the H & R Block area better results that may be due to more sand fill in a small localized area. Based on these results until proven differently the best we may be able to expect from a well-developed pickup point is around thirty-three feet maybe a little more of a depressurization zone under the slab.

Building Information (No Plans were available for review.)

The Northgate Shopping Center is L shaped with the parking lot in the middle. There's a roofed façade on the front of the building but behind the façade is a flat roof covered with rubber. The decking for the roof as viewed from the inside is steel. Steel trusses support the decking. The walls that the trusses span appear to be block. The height of the wall that supports the trusses appears to be about 14 feet. (Only Dream Bikes (Originally Laundry Land Cleaners) had the steel decking visible. The other spaces had drop ceiling for the most part at about 10 feet.)

No plans were available to review. It's assumed that the footers under the block walls are probably four feet deep. Therefore the possibility of communication between spaces separated by support walls seems unlikely. The majority of bathrooms were located in the backs of the spaces indicating that connecting sewers under the building may run under the back. Sewer manholes were observed in Roth Street and Ruskin Street behind the Shopping Center indicating that the building bathrooms most probably connect to the sewers in those streets.

The concrete floor was 6 to 8 inches thick. It appeared that two inches had been added over the original floor at some point as observed at the back doors of Naly's Floral, H & R Block, Falbo Bros. Pizza, and UPS Store. This may indicate that there may have been issues with the original floor at some point. So the integrity of the floor may be questionable. In limited areas that could be viewed where the floor abuts the wall some large gaps were observed. Most test points were drilled close to walls so leakage through where the floors abut walls could be a factor.



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Estimate For Installing Mitigation Systems

Dream Bikes

Based on the size the mitigation system would need (2) two well developed pickup points along the wall between Dream Bikes and Boomerangs. The wall is believed to be a support wall of block with footer assumed to be four feet down. Each Pickup point would be about at 33 feet. Dream Bikes ceiling is the metal roof sheeting approximately 14 feet or so above the floor. Would plan on connecting the two pickup points with piping and have one vertical pipe through the roof. The fan would then sit on that pipe and electric would have to also run through the roof. Anticipate using a fan capable of approximately 4 inches of vacuum. (Would be good to do a fan test early on to verify performance of well-developed pickup points.

Estimated Cost Range \$ 5,235 to 5,758

Boomerangs

Based on the size the mitigation system would need six (6) well developed pickup points; three pickup points spaced approximately 35 feet along each wall. Boomerangs is an active retail space so locations of pickup points may have to be shifted around displays etc. The ceiling is drop ceiling so the difficulty in connecting piping due to duct work is unknown. This design concept is based on assuming a fan for every two pickup points. Anticipate using a fan capable of approximately 4 inches of vacuum. Due to the nature of the business working around an active business will probably make for more difficulties.

Estimated Cost Range 19,785 to 21,985

Community Support Network

Based on the size of the area will need three (3) well developed pickup points; three pickup points spaced approximately 35 feet along the length of the area. Ceiling is unknown so the possibility of connecting the points to one or two fans is unknown. Assume two fans for estimating purposes. CSN is an active facility serving people with special needs. Inefficiencies are likely to be encountered. Assume vertical piping through roof and fan(s) above roof and electric. Anticipate using a fan(s) capable of approximately 4 inches of vacuum.

Estimated Cost Range \$9,935 to 11,245

Nalys Floral

Based on the size the mitigation system will need two (2) well developed pickup points; the points to be spaced approximately 33 feet along the wall between Naly's Floral and H& R Block.



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Part of ceiling is drop ceiling part may be dry wall in some of the back areas. Naly's is an active business so inefficiencies are likely. Assume vertical piping through roof and fan above roof and electric. Anticipate using a fan capable of approximately 4 inches of vacuum.

Estimated Cost Range \$5,575 to 6,135

H & R Block

Based on the size the mitigation system will need two (2) well developed pickup points; the points to be along the side toward Falbo Brothers Pizza. Anticipate using a fan capable of approximately 4 inches of vacuum. The fan will sit above the roof. The wall between the two is believed to be only a partition wall so no footer probably separates these two. The ceiling is drop ceiling. Currently H & R Block is not actively being used. Tax season sees the most use. Assume one fan connecting the two points exit through roof where the fan will be placed.

Estimated Cost Range \$ 5,450 to \$ 5, 900

Falbo Brothers Pizza

Based on the size of the area and that only a partition wall is believed to exist between it and H & R Block it's hoped that no separate system will be needed for this area.

Estimated Cost Range (None at this time.)

UPS Store

Based on the size of the area will need two (2) well developed pickup points; the points to be spaced approximately 33 feet along the most convenient wall. (Both walls appear to be block.) Anticipate using a fan capable of approximately 4 inches of vacuum. Assume vertical piping through roof and fan above roof and electric. Ceiling appeared to be drop ceiling.

Estimated Cost Range \$ 5,450 to \$ 5, 900

Total Estimated Cost Range \$51,430 to \$56,923

Prepared by: Anthony G. Hendricks P.E.

Cc: Rob Langdon, SCS



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Discussion of Variables, Options & Challenges That Can Impact Cost

First: The communication evaluation overall indicates tight probably well compacted soils. At this time my thinking is to try to expand a little on the development of the pickup points say one foot by one foot or one foot diameter to increase the surface area of the sidewalls still try to get three feet deep. In some cases we've found that we sometimes find looser material below two foot depth. No guarantee on this though. At this time I'm thinking a minimum of 33 foot spacing for pickup points in the areas of 100 ft. length, a minimum of 35 ft. spacing for the two areas that are 140 feet in length. Until a fan test is done on a fully developed pickup point the ability to extend the depressurization zone appears questionable at best.

Two: Consideration for the retail spaces would suggest possible doing the pickup points differently that would add cost. Instead of covering with a lid; hold the pickup points as close as possible to the walls, back fill with pea gravel or other suitable material around a perforated portion of PVC pipe that rests on the bottom of the pickup point then seal the top with concrete so that it is flush with the floor. Piping above floor would then be connected to the perforated PVC below and installed vertically up the wall.

Three: Option of horizontal pickup points as done in drainage/sump systems in basements. Although this is a potential option the question would be how effective and disruptive would this option be? Each segment would have to be probably 15 to 20 feet long. We'd only be working the most compacted layer of the fill and the potential for leakage along the length would be very high reducing the potential effectiveness unless there is very good quality control. Breaking out this much concrete etc. would be more disruptive of the retail spaces. At this point I'm not seriously considering this as a good option.

Four: In some of the spaces for instance CSN, Boomerangs, Naly's Floral, and the UPS Store we will probably need a small partition say of four feet by four feet covered in polyethylene to separate the work area from potential contact with those normally using these spaces. The only other option would be to try to do the work in off hours ie: when they are normally closed. The availability of getting contractors or contract labor during this times may be a difficult challenge?

Five: Misc. Cost Considerations not currently considered: a) Flooring -- Most of these spaces have a finished floor where the pickup point would be. So there's a high probability of needing to replace flooring after everything is done. Although we can try to hold the pipe as close to walls as possible there will still be a PVC pipe maybe with fittings sticking out of the floor. Trip Hazard? Would a chase be needed or advisable?

Six: Condensation that could drip off the exterior of the pipe. At this time I consider this unlikely for the following reasons: a) We are dealing for the most part in conditioned air. Most condensation issues arise when highly humid air surrounds pipe that's cooled due to moving air from below ground. Based on the tightness of the soil the air that each pickup point will generated is expected to



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be very low around 5 cfm to 10 cfm at most. My experience is that external condensation has only been an issue in high volume systems where the air is being pulled from below a basement. I think this is unlikely to be an issue in these systems.

Seven: Other issues to be considered: Equipment (for instance there is a boring machine with the ability to make 1 ft. diameter holes in concrete; will it fit and it would have to be used dry so dust collection would be critical.), ladders (accessing above the drop ceiling in particular) coordination with subcontractors.