REPORT
BUILDING SCIENCE SERVICES

EVALUATION OF SPECIFIC BUILDING CONCERNS REGARDING SOIL VAPOR TRANSPORT LOCATED AT 327 & 329 MAIN STREET HUNTINGTON, NEW YORK

ON-SITE VISITS CONDUCTED NOVEMBER 14, 2011

TURNER BUILDING SCIENCE & DESIGN, LLC

TURNER GROUP

MECHANICAL ENGINEERS • BUILDING SCIENTISTS • IAQ CONSULTANTS

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December 12, 2011

Mr. Gabriele Flickinger
14 Little Plains Court
Huntington, NY 11743

Via Email: giadarola@geiconsultants.com & others

SUBJECT: Report Regarding Forensic Evaluation
Mitigation of Pathways of VOC's from Carillon Cleaners
into an Adjoining Restaurant
Location: 327 & 329 Main Street
Huntington, New York

Dear Mr. Flickinger:

Background: In accordance with our approved consultant's Scope of Services dated October 27, 2011, we are pleased to offer this report concerning the results of our on-site evaluation and diagnostic measurements. The specific focus of the proposed services that we are reporting on was to conduct an evaluation of VOC migration pathways and to assist with the development of affordable, corrective action means at the above location. We understand from our phone discussions and documents that we received and reviewed, that despite reasonable appropriate professional efforts for soil gas (VOC vapors) mitigation, reported unacceptable chemical levels of PCE dry cleaning solvents have still been measured in the adjoining restaurant.

On November 14, 2011 we conducted a site visit to validate current building operational conditions, including building pressures and basic HVAC operation. From the on-site evaluation and field data obtained, we have reached professional conclusions, and we have suggested an initial plan of corrective action. These recommendations are based on the on-site data and our general historical experience and knowledge of building science regarding pressure fields and soil vapor material transport.

The intent of these services is to assist the Owner with appropriate short and long-term decisions regarding resolution of the historical situation with unacceptable indoor levels of PCE materials within the restaurant. The report is rather technical, thus the reader may need to have technical expertise to understand the report.

We are pleased to serve as professional consultants to you and GEI Consultants and we remain ready to further assist you with this situation if the need arises.

Please contact us if there are any questions on subjects presented here that need further clarification. You can reach William Turner at (800) 439-3446, ext. 311, or in the event of his absence, Steven Caulfield at ext. 314 in our Harrison, Maine office.

Sincerely,

TURNER BUILDING SCIENCE & DESIGN, LLC

William A. Turner, MS, P.E.
President/CEO

Steven Caulfield, P.E., CIH
Senior Vice President

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Attachments

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APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 Background: The owner has retained Turner Building Science & Design, LLC (TBS) to provide a forensic evaluation of migration pathways regarding the PCE that has been measured on several occasions within 329 Main Street. This restaurant is located immediately adjacent (attached) to a dry cleaning establishment located at 327 Main Street. The dry cleaning establishment is known to have a concentration of PCE located under the basement slab. Despite the installation of an effective sub-slab soil vapor extraction system, which has been installed in the basement of the dry cleaning establishment and under the slab in the restaurant, reported elevated PCE levels have persisted to a reported unacceptable degree in the restaurant.

1.2 Results of Pressure Diagnostics Revealed the Following

Finding #1: High restaurant negative pressures: In the as-found condition, when the restaurant kitchen hood exhaust and wall prop fan exhaust are operated (separately or together) they create sufficient negative pressures in the restaurant to pull air directly from the dry cleaning shop (first floor and basement) through parting wall penetrations into the restaurant. The dry cleaning machine and associated isolation room are directly on the other side of the wall adjacent to the restaurant (see Cross-Sections Sketch, Appendix B).

Finding #2: Effective soil gas capture and pressure field extension: In the as-found condition, the current soil vapor extraction system (which is located under the dry cleaning establishment and also effecting the basement floor of the restaurant), clearly creates sufficient suction under the floors to move room air down into the sub-slab soil, even though the restaurant exhaust fans and dry cleaning exhaust fans create negative pressures in the rooms above (i.e. the soil vapor extraction system is not being over-powered (reserved) by the observed high negative building pressures).

Finding #3: The PCE being measured in the restaurant is originating from the dry cleaning machine operation in the attached structure, not the contaminated soil below the buildings. It can be concluded from the diagnostics that the cause of the elevated PCE in the restaurants is from the fugitive emissions associated with the air inside the adjacent attached structure, not the soil below it. **Thus, it is our professional opinion that additional mitigation efforts need to deal with the effective control of PCE in the current dry cleaning operations, and improving building pressures between the two buildings.**

1.3 Recommendations for Corrective Action (See details within report section 2.0)

Recommendation #1: Provide Better Containment of PCE in the Cleaning Establishment
Recommendation #2: Improved Air Sealing at the Parting Wall of #327 and #329
Recommendation #3: Provide Improved Pressure Relationships between the Buildings

2.0 OBSERVATIONS, ANALYSIS, DISCUSSION AND RECOMMENDATIONS

2.1 Building Pressure Diagnostics

On November 14, 2011 we visited the site and gained access to the roof and basement of both #327 and #329 Main Street. We observed the current HVAC systems, focusing on inter-zonal pressures created by the exhaust and make-up air systems. A comparison to any HVAC drawings was not made, as no drawings have been made available for either facility. Observations are as follows:

2.1.1 Restaurant Establishment Observations: By observation, there is a rooftop heating and cooling unit with no indication of outside air introduction. There is an atmospherically vented, gas hot water heater located in the basement. There is also a kitchen exhaust hood and a wall mounted exhaust fan (see Photos, Appendix A). It is very unclear as to whether there is any planned make-up air supplied for the exhausts. There is a rather clogged hood on the roof in the vicinity of the exhaust that may have been, or could still be, intended for make-up air intake from the roof (see Photo #3, Appendix A). Evaluation of the suspect make-up air hoods function is beyond our scope.

Test Conditions: Pressure testing was conducted with:

a) The entry doors to the establishment in the closed position.
b) With a calibrated digital micromanometer and chemical tracer smoke.
c) The exhaust hood alone operated, at the as-found setting of 843 on the Variable Frequency Drive speed control that turns it on.

   With the above conditions, the facility overall pressure is -10 pascals.

d) If the prop fan on the wall is also turned on with the hood fan, the resulting pressure is -20 pascals.

Finding: Under exhaust fan operating conditions, the negative pressures were confirmed (with chemical smoke) to move air from the dry cleaning establishment

into the restaurant via air leakage sites in the parting wall (see Photo #4, Appendix A & Sketch, Appendix B).

2.1.2 Sub-Slab Pressure Field Extension Observations Under Restaurant: In both of the above noted restaurant exhaust negative pressure fan conditions (-10 and -20 pascals), the current soil vapor extraction system (which is located under the dry cleaning establishment and the basement floor of the restaurant), was observed at the vapor test ports in the basement, to create sufficient suction under the floors, to move room air down into the sub-slab soil even though the restaurant exhaust fans and dry cleaning exhaust fans create negative pressures in the rooms above (Test Port Photo #5, Appendix A).

Finding: The soil vapor extraction system's basement floor suction is not over-powered by the observed negative building pressures created by the restaurant exhaust fans.

2.1.3 Dry Cleaning Establishment Observations: By observation, located on the roof, there are:

a) Two non-functional, large evaporative cooling make-up air units.
b) Three general exhaust fans of various sizes.
c) A dedicated (dry cleaning machine) isolation room exhaust fan with a horizontal discharge duct located on the roof.
d) A very powerful (high capacity) exhaust fan fitted into one of the abandoned make-up air evaporative coolers.
e) Five (5) exhaust fans in total.

There is a steam generating boiler located inside a segregated boiler room in the rear of the building that appears to provide both process steam and heat to the facility. There is also what appears to be the condenser for an air conditioning unit located in the room.

Make-up air is currently provided passively via the abandoned, evaporative, cooling units and via reverse air flow through any exhaust fans when they are not operating, whenever the building is pulled negative via the exhaust fan operation for the dry cleaning establishment (see Photo #6, Appendix A).

Test Conditions: Pressure testing was conducted with the entry doors to the dry cleaning establishment in the closed position, with a calibrated digital micromanometer and tracer chemical smoke. We determined that when the isolation room exhaust fan is running, and all but the very large exhaust fan that is retrofitted in one of the abandoned swamp coolers is operated (total of (4) four fans), the overall facility pressure is -8 pascals, and a total of only -4 pascals when

only two fans are operated, which is reported to be the normal operating condition.

If the very large retrofitted prop fan is also turned on, the pressure rises to -31 pascals (we are told the use of this large fan is rare other than on very hot days, when certain infrequently used pieces of steam supplied equipment are used, and when it is used the back door is propped open). With the back door propped open wide, negative pressures were confirmed to be low, in the range of -4 or less pascals.

Finding: Under the normal operating building conditions, for both buildings, the restaurant exhaust fans create a larger suction pressure than the dry cleaning exhaust fans do and thus pull room air directly from the dry cleaning establishment into the restaurant establishment. This observation was also visually confirmed with smoke tracer in the basement area of the dry cleaner establishment wall penetrations.

2.1.4 Sub-Slab Pressure Field Extension Observations Under Dry Cleaning Establishment: When testing was conducted with all of the above noted exhaust fan operational conditions for the dry cleaning establishment, the current soil vapor extraction system (which is located under the dry cleaning establishment and restaurant) was observed at both of the test ports. Results indicated that the sub-slab suction was sufficient suction under the floors to move room air down into the sub-slab soil even though the restaurant exhaust fans and dry cleaning exhaust fans create negative pressures in the rooms above. Air movement at a partially filled construction hole in the side wall near the vapor extraction was also confirmed to be in the desired direction, down into the sub-slab (see Photo #9).

Finding: The soil vapor extraction system is not over-powered by the observed negative building pressures within the dry cleaning establishment or the restaurant establishment, even if all exhaust fans in both establishments are operating.

2.2 Conclusions

2.2.1 The PCE which has been measured in the restaurant does not migrate from the soil into the restaurant as its primary entry mechanism: On-site results of the detailed pressure mapping conducted by TBS and reported on above, indicates that the PCE being measured in the restaurant must be originating from the current dry cleaning machine operation in the immediately attached structure, not the contaminated soil below the buildings. It can be concluded from the pressure diagnostics summarized above that the cause of the

elevated PCE in the restaurants is from the fugitive emissions associated with the air inside the adjacent attached structure, not the soil below it.

2.3 Recommendations for Corrective Action

2.3.1 Expected Effective Mitigation Strategies: Given the results of the pressure mapping data, effective mitigation aimed at lowering the PCE levels in the restaurant need to deal with improving the control of PCE inside the dry cleaning building during the current dry cleaning operations.

This can be accomplished by reducing PCE levels in the adjoining isolation room, improving observed building pressures, and improved air sealing at the parting wall. Alternately, it could be accomplished by eliminating the PCE use and switching to a green dry cleaning process.

There are several approaches that should have a beneficial effect at lowering the measured PCE levels within the restaurant. The mitigation approaches include:

a) Better containing the PCE within the area of the dry-cleaning isolation room with increased machine maintenance and increased exhaust from the isolation room.
b) Improved air sealing at the parting wall of #327 and #329.
c) Reducing negative pressures in the restaurant.

Recommendation #1: Provide Better Containment of PCE in the Cleaning Establishment

It is our understanding that the dry cleaning machine isolation area door cannot be kept closed due to overheating and that PCE within the room is associated with the machine operation. Discussions with a representative of the owner included the concept of modifying one of the larger existing exhaust fans located above the containment room, such that it extracts more air and heat from the containment room and at a much higher rate than it is currently exhausted at. This approach makes sense; however, all exhaust fans will need to be maintained to prevent clogging (see Photos #8 and #10). Proper design of such a system, or review of a design, is not part of our scope.

Recommendation #2: Improved Air Sealing at the Parting Wall of #327 and #329

Access to the block wall separating the facility is not readily accomplished; however, the concept of improved air sealing also makes sense. As a minimum, appropriate fire stop materials can be utilized where holes or penetrations can be identified, such as the penetration in the wall in Photos #4 and #9 in Appendix A. Design of such a system, or review of a design, is not part of our scope.

Recommendation #3: Provide Improved Pressure Relationships between the Buildings

If the restaurant has a make-up air system for the kitchen exhaust hood, it should be placed back in service as the negative suction is borderline for violation of typical NFPA guidelines for negative pressures related to kitchens with gas-fired equipment. Additionally, there is an atmospherically vented, hot water heater located in the basement that could be down-drafted by negative building pressures at various times during the year. This approach to provide proper make-up air provisions makes sense; however, equipment will need to be maintained to prevent clogging (see Photo #3, Appendix A). Design of such a system, or review of a design, is not part of our scope.

3.0 LIMITATIONS OF TBS SERVICES

The review of received materials, new data collection, analysis, conclusions, and recommendations contained within this report are based on a review of what are believed to be materials generated by qualified professionals, and generally representative of the building situation at the time the data was generated. We have made professional recommendations to undertake specific corrective actions based on the information available to us at this time. Our current analysis is based on what is believed to be representative information by others, as well as information gained in our own observations. We believe all of the information to be accurate and representative of the specific conditions encountered within the facility during the various periods; however, it is impossible to know if the observations conducted are a good representation of all of the various zones or areas within the facility.

Appendix A

Representative Photos

Photo #1: Restaurant hood exhaust fan.

Photo #2: Restaurant wall exhaust fan.

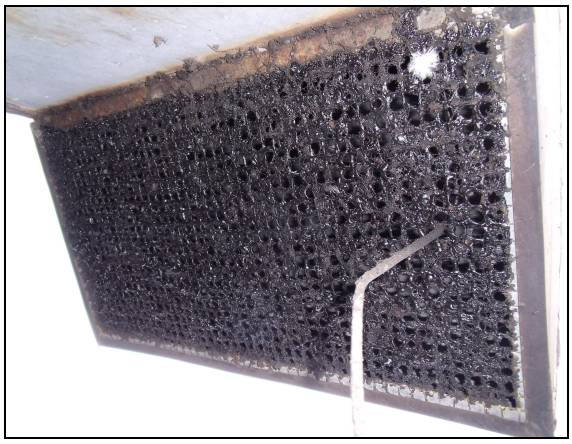


Photo #3: Restaurant rooftop air intake???

Photo #4: Air flow into restaurant from dry cleaner basement.

Photo #5: Restaurant basement floor test port.

Photo #6: Restaurant rooftop heating unit.

Photo #7: Dry cleaner rooftop equipment.

Photo #8: Dry cleaner machine room exhaust.

Photo #9: Construction hole basement of dry cleaner.

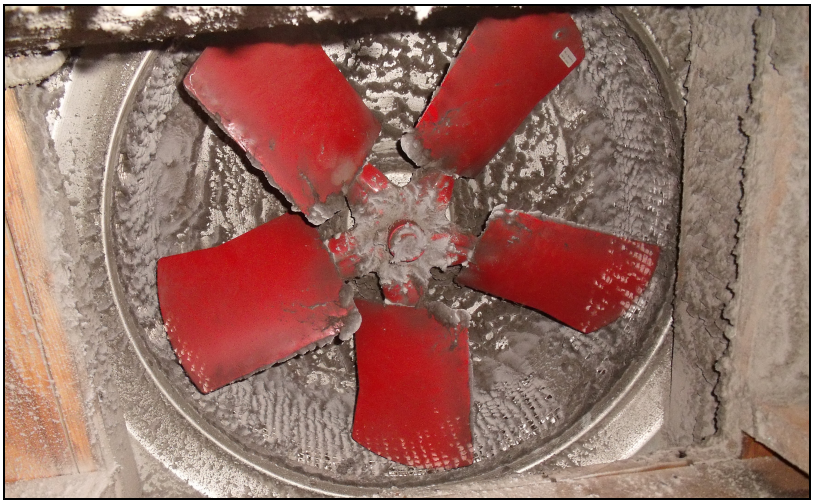
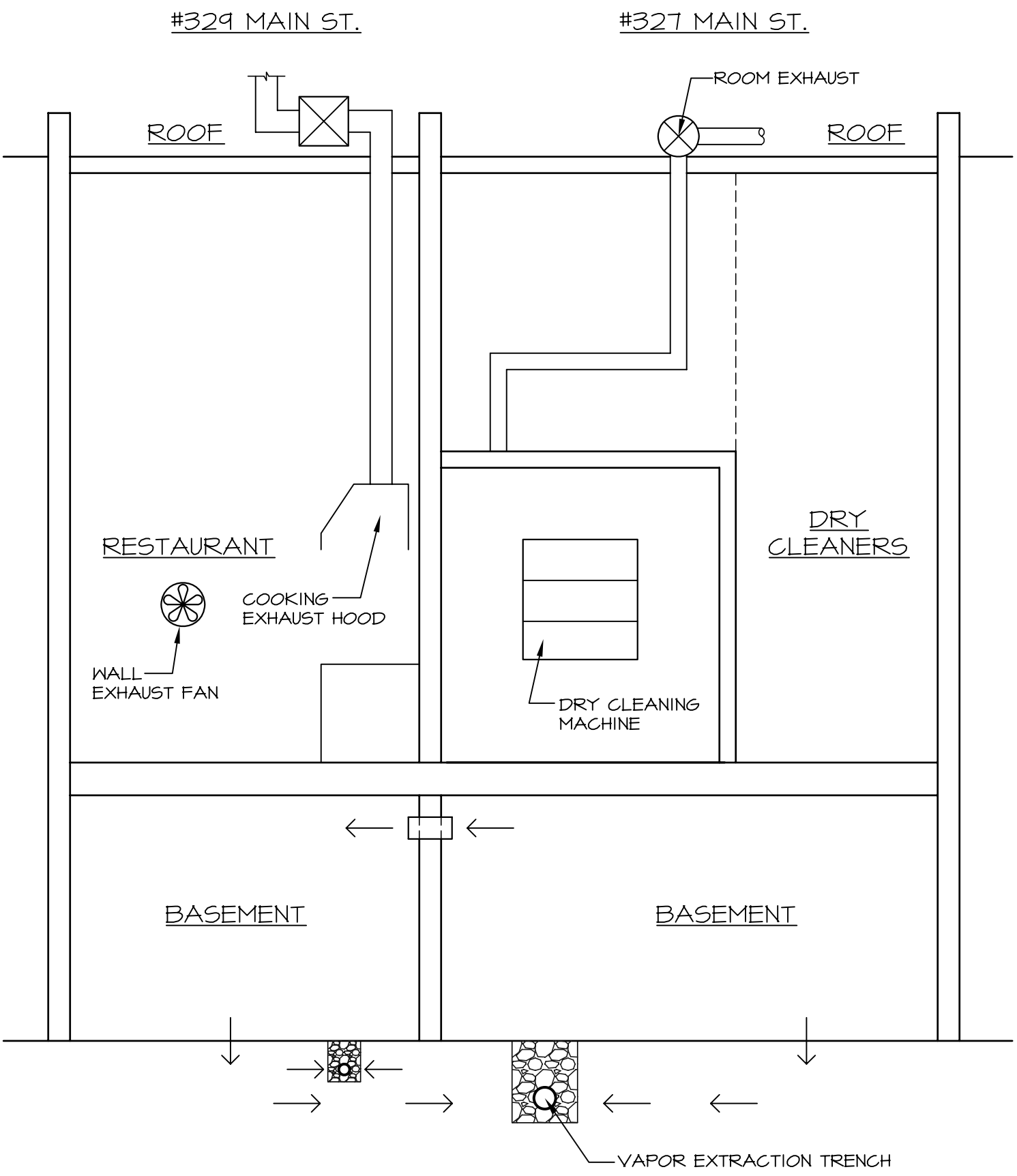


Photo #10: Dry cleaner general exhaust (1 of 4).

Appendix B

Cross-Sectional Sketch



SKETCH OF CROSS SECTION FROM STREET VIEW