

INNOVATIVE USE OF VAPOR INTRUSION COATING SPEEDS RENOVATIONS

CASE STUDY:

Retro-Coat Utilized to Prevent Harmful
TCE and Chloroform Vapor Intrusion





OVERVIEW

A former industrial manufacturing facility in Greenville, SC was purchased for redevelopment in 2017. Building improvements were planned to include a warehouse, offices and self-storage units to serve a growing commercial area. Now located within an urban commercial land use area of Greenville, redevelopment plans included converting the industrial warehouse building into climate controlled self-storage units, and renovating the office into an apartment unit and office.

Prior to purchasing the site in 2017, the current site owners entered into a Voluntary Cleanup Contract and Brownfields agreement with the South Carolina Department of Health and Environmental Control (SCDHEC). The Brownfields agreement allowed the site owners to purchase the site while receiving

SCDHEC liability protection for existing environmental contamination by agreeing to perform certain environmental assessment, mitigation, or remediation activities.



Photo depicts site conditions before Retro-Coat Installation.

HIGHLIGHTS



APPLY TO EXISTING STRUCTURES

The Retro-Coat barrier and Vapor-Vent system were incorporated into already planned renovations, saving the site owner time and money.



STRONG AND CHEMICALLY RESISTANT

Retro-Coat is resistant to both TCE and chloroform and is a wearing surface, rated for foot and forklift traffic.



RAPID APPLICATION TIME

The Retro-Coat system layers cure quickly, reducing building downtime.



SAFE AND EFFECTIVE

The combination of Retro-Coat and Vapor-Vent was chosen as a remedial solution to mitigate the risk of harmful vapor intrusion.



To prepare for renovations to the existing structures, the site owners enlisted the expertise of Bunnell Lammons Engineering (BLE) to conduct various soil, groundwater, and vapor intrusion assessments while the site was vacant. Vapor intrusion assessments included collecting sub-slab soil gas samples and indoor air samples. Sub-slab soil gas samples detected various volatile organic compounds (VOCs) above the laboratory method detection limit. BLE utilized the Environmental Protection Agency (EPA) Vapor Intrusion Screening Level (VISL) calculator to model potential indoor air concentrations of VOCs based on the sub-slab soil gas results. Based on these calculations, two VOCs, chloroform and TCE, had estimated indoor air concentrations above their respective EPA Industrial/Commercial Risk Based Screening Level (RSL). The indoor air samples had detections of TCE above the EPA Residential RSL.



PROJECT TIMELINE

September 2016

Phase I Environmental Site Assessment, prepared by Froehling & Robertson, Inc. (F&R)

January 2017

Limited Phase II Environmental Site Assessment, prepared by F&R

October 2017

Site Investigation Report, Prepared by BLE



May 2018

Vapor Intrusion Assessment Prepared by BLE

October 2018

Retro-Coat is applied by Certified Applicator SAEDACCO



Summer 2019

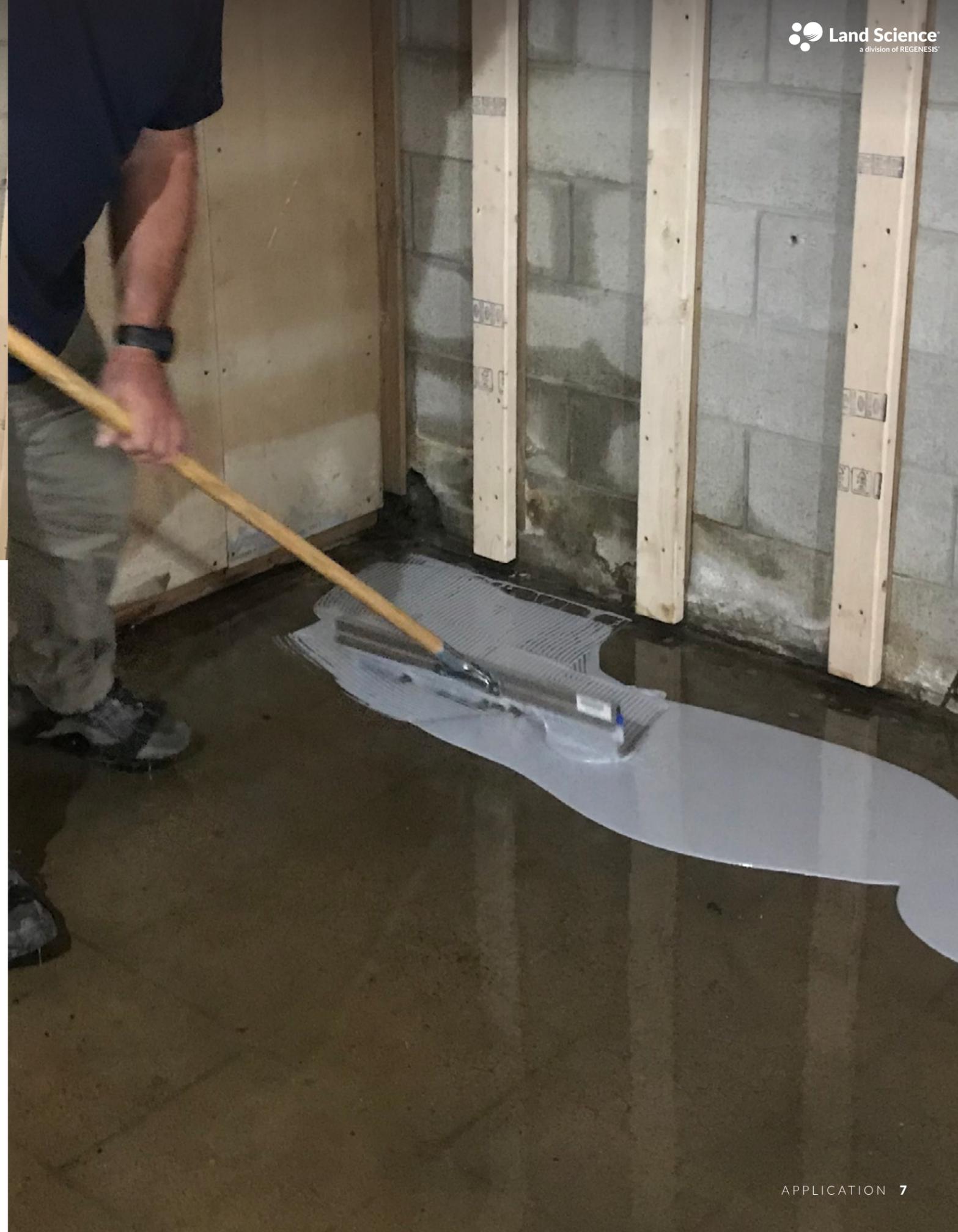
Confirmation Sampling

Winter 2019-2020

Confirmation Sampling

 BLE recommended the installation of Retro-Coat®, a vapor intrusion mitigation coating system...

With the site's prior history of industrial operations and the known vapor intrusion risks, the site owners and the SCDHEC determined a vapor mitigation system in the apartment and office space was necessary to help prevent potential exposure to VOCs, namely TCE and chloroform. BLE recommended the installation of Retro-Coat®, a vapor intrusion mitigation coating system, in conjunction with a passive sub-slab depressurization system (SSDS) comprised of Vapor-Vent to protect the structure from vapor intrusion. BLE's recommendation was ultimately approved by the SCDHEC and accepted by the site owners.



APPLICATION

A passive sub-slab depressurization system (SSDS) was installed through the approximate middle of the apartment and office area to provide a preferential pathway for contaminant vapors to safely migrate from below the building to the roofline. The SSDS consisted of Vapor-Vent® laid in an approximate 14 inch wide by 5 inch deep (below base of concrete slab) trench, stubbed up to two vent riser locations to terminate above the roofline. The bottom 2 inches of the trench consists of washed clean stone, followed by Vapor-Vent, followed by 2 inches of clean stone. New concrete was placed flush with the existing slab to fill in the trench line.

Following the Vapor-Vent installation, Retro-Coat was installed across the concrete slab of the apartment and office space. The installation was conducted by SAEDACCO, a certified Retro-Coat Applicator of

Land Science. To prepare the site for the Retro-Coat application, SAEDACCO mechanically ground the existing concrete to achieve a sound profile for the Retro-Coat system to bond. Cracks and divots in the slab were treated with Retro-Coat GEL to create a level finished floor. Retro-Coat Primer MV was installed in two 10-mil coats, followed by the Retro-Coat layer at a 20-mil thickness. Retro-Coat caulk was installed around penetrations, along interior wall tracks, and the building perimeter, to further seal the floor system.

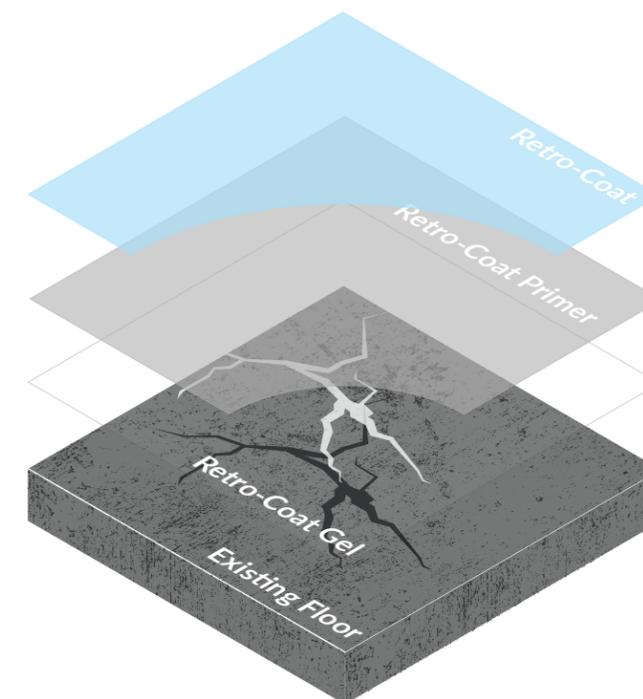
Retro-Coat™
Vapor Intrusion Coating



TECHNOLOGY

Retro-Coat™ Vapor Intrusion Coating

Retro-Coat Vapor Intrusion Coating consists of chemically resistant materials which protect existing structures from the threat of contaminant vapor intrusion. Retro-Coat was developed by experienced vapor intrusion specialists and is proven to resist the most aggressive chemical vapors, such as PCE and TCE. This niche technology acts as a protective barrier, eliminating the need to remove the existing slab and can act as a wearing, traffic-bearing surface if desired.



RESULTS

Incorporating the vapor mitigation technology into the anticipated renovations was both cost and time effective for the site owner. The combination of Vapor-Vent and Retro-Coat was determined as a mitigation technique to reduce the potential risk of harmful vapor intrusion in

the new apartment and office. BLE will perform two rounds of post-mitigation sampling, one in the summer between June and September 2019 and one in the winter between December 2019 and February 2020 to verify the effectiveness to the system.

Vapor-Vent™ Vapor Collection System

Vapor-Vent® is a low-profile vent system used in lieu of slotted PVC pipe. Through either passive or active ventilation, Vapor-Vent can safely regulate underground pressure. This technology provides cost savings through its quick installation and low-profile design.

ABOUT THE CONSULTANT

Bunnell Lammons Engineering (BLE) provides engineering and environmental solutions for projects in commercial, industrial, institutional and infrastructure markets. BLE's services include environmental consulting and engineering, geotechnical engineering, construction engineering and inspections, and construction materials testing. The firm maintains a full-service in-house geotechnical and materials testing laboratory as well as an environmental and geotechnical drilling fleet. Utilizing a team approach, BLE provides clients with the technical expertise required to successfully complete each project. Founded in 1996, BLE is headquartered in Greenville, SC with a regional office in Asheville, NC. For more information, visit www.blecorp.com or follow BLE on Facebook, Twitter, and LinkedIn.



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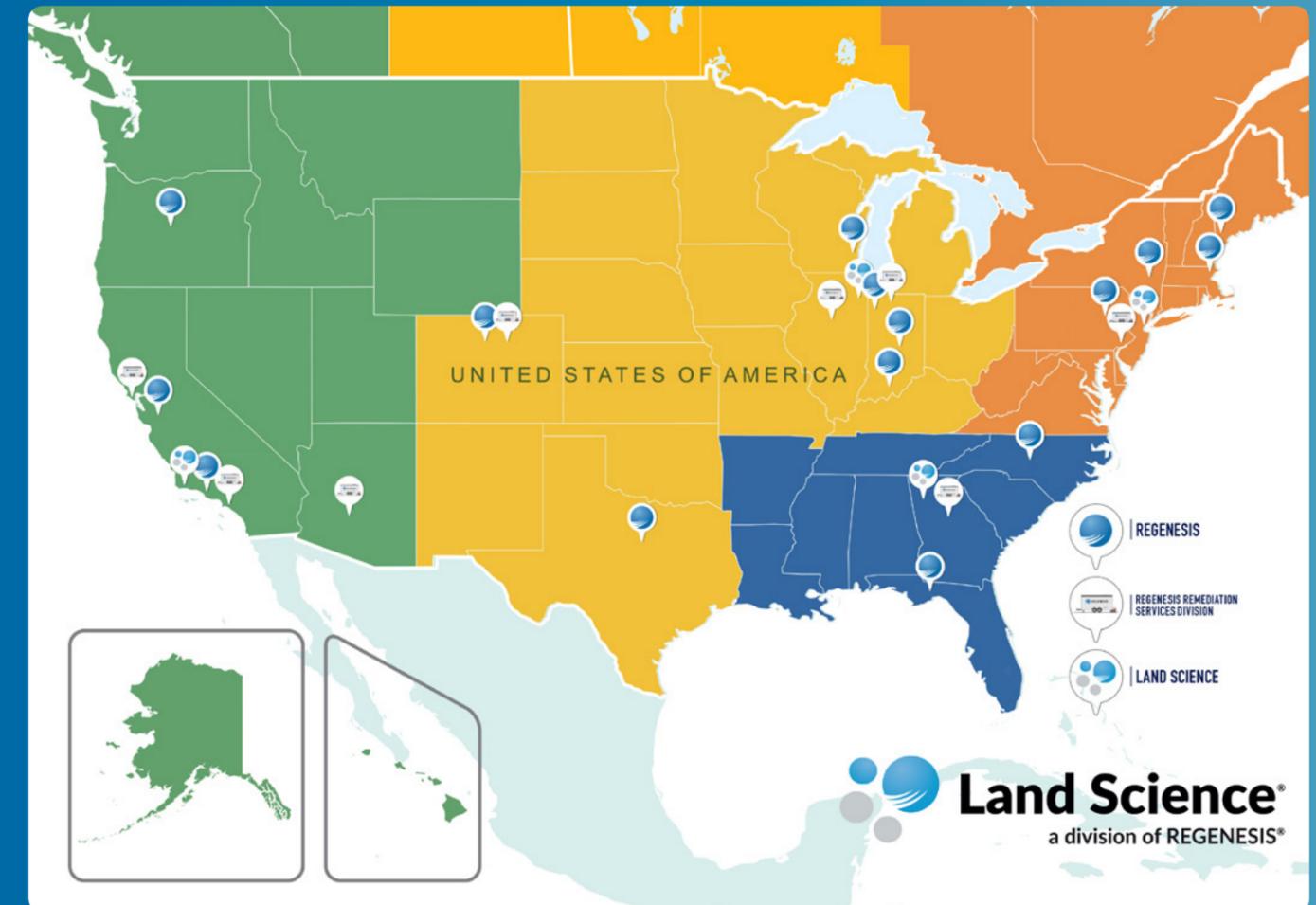
ABOUT THE CERTIFIED RETRO-COAT APPLICATOR

South Atlantic Environmental Drilling and Construction Co. Inc. (SAEDACCO): SAEDACCO is a southeast regional environmental services company and a Certified Applicator of Land Science's Retro-Coat, Vapor-Vent, and Geo-Seal® vapor intrusion mitigation technologies. SAEDACCO is located in Fort Mill, SC and specializes in providing Direct Push, Drilling, Construction, Vapor Mitigation, and Remediation services for the environmental industry. The company was founded in 1993 and has established itself as a leading provider of investigation and remediation services to the environmental and engineering consulting industry throughout the Southeastern United States.



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WE'RE READY TO HELP YOU FIND THE RIGHT SOLUTION FOR YOUR SITE



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