

NITRA-SEAL ENSURES LONG TERM VAPOR INTRUSION PROTECTION FOR QUICK SERVICE RESTAURANT

CASE STUDY:

A Highly Effective Vapor Barrier and
Efficient Installation “*Fits the Bill*” for
this Site



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Overview

A Preemptive Solution is Needed to Address Potential Vapor Intrusion at a New Quick Service Restaurant Leading to Specification of Nitra-Seal

The project development site is a newly opened quick-service restaurant in Conyers, Georgia, a short drive from Atlanta. With a population approaching 6 million people, Atlanta is the fourth-fastest growing metropolitan area in the United States, and its exponential growth has extended toward suburban communities such as Conyers. In response, national quick-service restaurant chains and their property developer partners working in the region are looking for creative, efficient, and cost-effective ways to redevelop brownfield properties to meet the growing population's service needs.



Quick service retail restaurant required an effective preemptive vapor mitigation solution to protect future employees and customers from potential vapor intrusion risks

Offsite chemical spills from historical operations had resulted in low-level volatile organic compounds (VOCs) released to the subsurface, creating a potential for vapors to intrude into new buildings constructed in the affected area, including the site building. Recognizing the risk and placing emphasis on future workers' safety, the forward-thinking client decided that a preemptive measure be instituted, requiring the installation of a vapor mitigation system as part of the construction specification.



The project development team determined Nitra-Seal was the safest, most expedient and cost-effective vapor barrier system to install on this site

United Consulting, an environmental consulting firm based in the Southeast, has been involved in a wide variety of brownfield redevelopment projects. As leaders in the brownfield redevelopment market, they have extensive experience in specifying safe, effective, and cost-competitive vapor barrier systems to ensure long-term protection for their clients' tenants and patrons. Knowledgeable of the latest vapor mitigation innovations, United Consulting and their client specified Land Science® Nitra-Seal® for the new quick service restaurant.

According to United Consulting's Project Manager, Spencer Cox, "What's unique about this project is the client had to buy this property, sight unseen, with offsite issues around it. And in doing that, (the client) has taken preemptive measures, including Land Science's Nitra-Seal to protect its employees and guests."

The project team ultimately specified Nitra-Seal for incorporation into the new building from the vapor mitigation system options available to address potential VOC migration to indoor air. Below is a discussion of key factors that led to this decision.



Background

Key Factors that Led the Project Development Team to Select Nitra-Seal Over Alternative Vapor Intrusion Mitigation Systems



Nitra-Seal is an advanced composite vapor barrier system incorporating a Nitra-Core™, a nitrile-advanced asphalt latex component applied between two layers of high density polyethylene (HDPE) material bonded to a geotextile. This multi-layer system provides enhanced protection against indoor air exposure to sub-slab chemical vapors.

Nitra-Seal provides a significant improvement over comparable composite vapor barrier systems on the market. In lab testing, Nitra-Core delivered 10x greater chemical resistance against VOCs in comparison to SBR latex asphaltic sprays. Nitrile's chemical resistance is long-established, verified in the laboratory to be highly effective against a wide range of VOCs like chlorinated solvents, petroleum contaminants, and methane. Workers commonly use nitrile-enhanced materials in the environmental and medical fields as personal protective equipment (i.e., PPE) due to its chemical resistivity, puncture resistance, and tensile strength. These latter two features are uniquely beneficial for use in the construction industry where strong, flexible, and puncture-resistant materials are desirable for damage protection against moving construction workers, equipment, and tools.

The Nitra-Core layer in Nitra-Seal is remarkably fast-curing, and it also bypasses the need for taped seams or other mechanical fastenings at terminations. These features minimize the impact on construction schedules. Speed-to-market is an essential consideration in identifying new developments, including the development of this property.

As experienced leaders in guiding clients toward effective vapor mitigation solutions, United Consulting was familiar with Land Science Nitra-Seal. Having specified Nitra-Seal at other locations, United Consulting felt confident in its overall value, representing the safest, most cost-effective long-term solution for new construction sites with low to mid-range contaminant levels.

As Mr. Cox states, “Key factors for picking a vapor barrier are cost, speed of installation, and ease of use, and Land Science’s Nitra-Seal fits the bill for this.”

In addition to Nitra-Seal’s differentiating features, receiving high-level, responsive project support is also critical in selecting a vapor-mitigation approach. “Much like United Consulting, Land Science is solution-oriented and cares about its product and the client’s project. When we call them for questions, they jump on it,” Mr. Cox shares.



Workers installing Nitra-Seal's spray-applied nitrile advanced asphalt latex core on this site

Application

Nitra-Seal Passes Smoke Testing for Quality Control



Land Science Certified Applicator
S&H Waterproofing and Construction,
installed Nitra-Seal and performed
smoke testing as part of the quality
control process to confirm proper
installation of the barrier.

The project team was committed to installing a safe and effective barrier, and Land Science's Certified Applicator program reciprocates this commitment. S&H Waterproofing and Construction, a Land Science Certified Applicator well-known throughout the Southeast, completed the installation per the manufacturer's exacting standards. Upon completion, United Consulting was on hand to confirm the vapor barrier's installation per the specifications. The application proved successful as the Nitra-Seal vapor barrier system passed the smoke test and other quality control measures, putting to rest any performance concerns.



Nitra-Seal's spray-applied nitrile-advanced asphalt latex component seals seams and penetrations, providing excellent efficacy and ease of installation.

Technology Used

Nitra-Seal



Nitra-Seal is a chemically resistant composite spray-applied vapor barrier. The solution's unique triple-layer system is composed of the Nitra-Base layer (bottom) and the Nitra-Bond layer (top), with the Nitra-Core layer in between. Both top and bottom layers consist of a HDPE material bonded to a geo-textile on the out-facing side. HDPE provides chemical resistance, high tensile strength, crack resistance, and reliable subsurface containment. The geo-textile is physically bonded to the chemical resistant layer. This allows the Nitra-Bond layer to adhere to the slab, and provides a friction course between the Nitra-Base layer and the soil. The Nitra-Core layer is composed of a nitrile-modified asphaltic membrane. The incorporation of nitrile, which is proven to provide exceptional chemical resistance in a range of applications, is unique to the Nitra-Seal system. The Nitra-Core spray-applied nitrile/asphalt emulsion forms a highly robust seal around slab penetrations and eliminates the need for mechanical fastening at termination points.



Nitra-Seal™

Nitrile-Advanced Vapor Barrier

Land Science Bond

HDPE/Geotextile

5 mil high density polyethylene (HDPE) sheet thermally bonded to a 3 ounce geotextile facing up to bond into concrete.

Nitra-Core

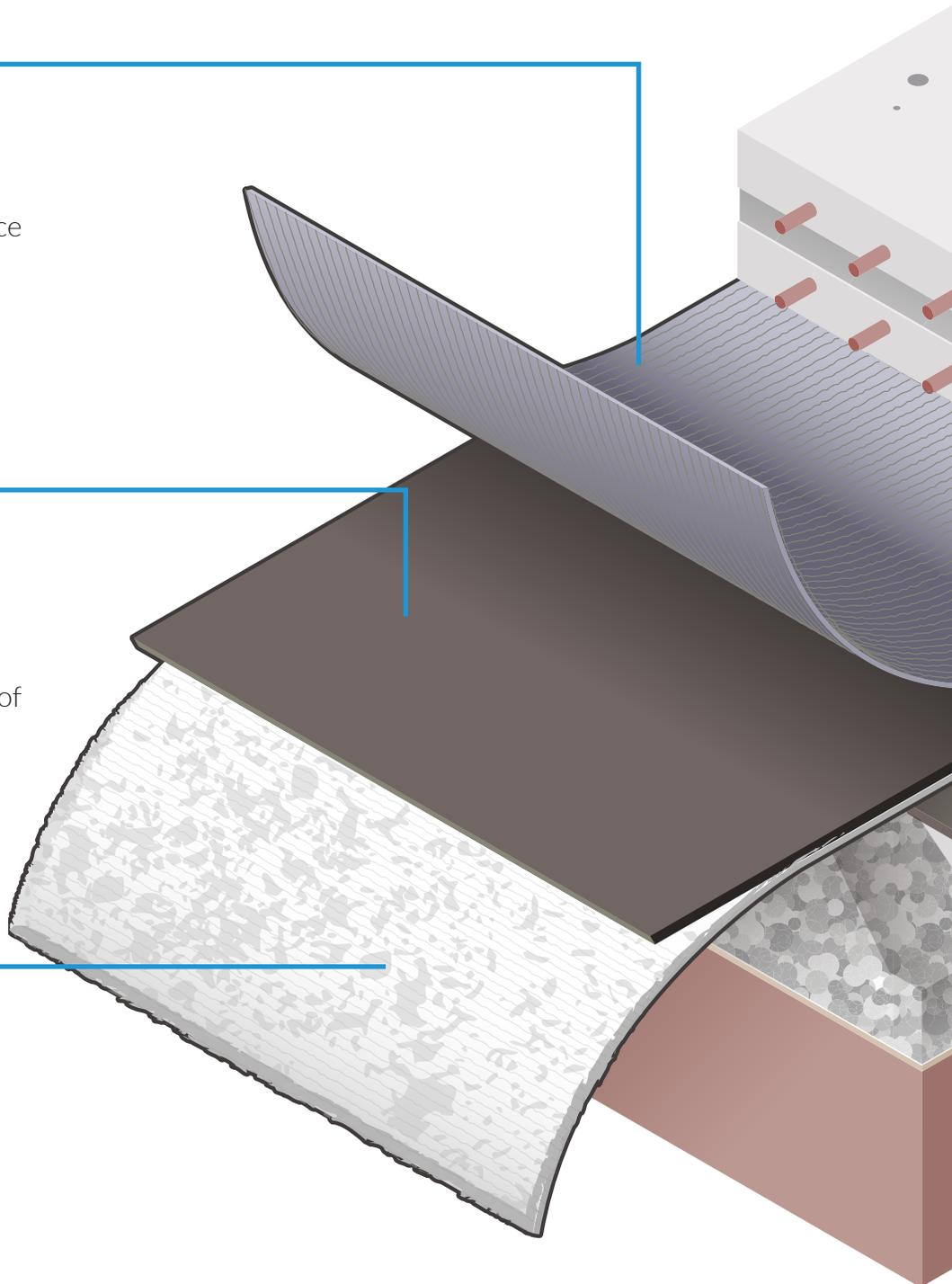
(Spray Applied)

Spray applied as an asphalt/nitrile emulsion to form a chemically resistant layer with nominal thickness of 40 mils (dry).

Nitra-Base

HDPE/Geotextile

10 mil high density polyethylene (HDPE) sheet thermally bonded to a 3-ounce geotextile facing down as course protection.





S&H, a Land Science Certified Applicator, apply a complete installation of the Nitra-Core layer

Results

Vapor Intrusion Mitigation System Allows Development of New Quick Service Restaurant

S&H, a Land Science Certified Applicator, installed the system following the manufacturer specifications, having passed all quality control measures, including smoke testing. Following the successful Nitra-Seal passive vapor barrier system installation and quality control testing, the project development team moved forward with construction. Nitra-Seal's construction-friendly qualities kept the project on time and budget, allowing the new quick-service restaurant to proceed toward its recent grand opening. The new establishment's employees and patrons are protected from potential exposure to harmful chemical vapors.

It is a rule in business that a project completed successfully will lead to more projects. Mr. Cox agrees, "Based on the success of this site, our restaurant client will likely be using Nitra-Seal on other sites."



An aerial view of the application process shows Nitra-Core applied first to seams and penetrations, and later on top of the entire base component



The Consultant

United Consulting



United Consulting offers comprehensive environmental services, including Phase I and Phase II Environmental Site Assessments and Vapor Intrusion/Risk Assessments as well as Brownfields, contaminated soil or groundwater testing, asbestos and lead-based paint surveys, and wetland and stream bank delineation and permitting. Additionally, we conduct Hazard Evaluations and Analysis in conjunction with the Georgia State Board of Education Standards.



About Spencer Cox

Spencer Cox is a Project Environmental Specialist at United Consulting, a multidiscipline engineering consulting firm based in the Southeast. His role with United Consulting involves a host of responsibilities including performing due-diligence assessments on residential, commercial, and industrial properties, negotiating properties through the Georgia Brownfields program, conducting Corrective Action Plans for hazardous waste facilities, all contributing to the success of United's diverse client base. To prepare for such a diverse range of responsibilities, Cox earned his BS in Biology from Kennesaw State University in Georgia, where he also minored in Stream Ecology. With almost 10 years of experience with United Consulting, Cox enjoys the challenges that come with his role. To date, he has worked on projects in thirteen states and says he hopes to reach all 50 states one day.



The Land Science Certified Applicator S&H Waterproofing

S&H waterproofing, a Land Science certified applicator, is known throughout the Southeast for its trusted and thorough application of Land Science' full-suite of vapor barrier systems. Centrally located in Piedmont, AL, the S&H team can quickly mobilize to sites throughout the US and has extensive experience in applying safe and effective vapor barrier solutions on a wide range of site types. Knowledgeable and trained to ensure every installation meets Land Science' exacting specifications, S&H performs a variety of quality control measures including smoke testing to guarantee the system's effectiveness in mitigating contaminant vapor exposure.





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