AshleyCapital

The Case for Active VI Systems

An Owner's Perspective on Performance, Verification, and Long-Term O&M



Mark J. Quimby, CEP

Vice President

Ashley Capital

mquimby@ashleycapital.com

How My Perspective Changed

Same VI systems; different seat at the table

Consultant



- *Design*
- *Construction Oversight*

Corporate Tenant



- *Review & Inspections*
- *Portfolio Risk & Compliance*

Owner/Developer



- *Construction & Long-Term O&M*
- *Lifecycle Cost & Performance*

The technology did not change.
My responsibility for demonstrating performance did.

The Question Changed

How do I know the system is working?

New System

Was it successfully commissioned?

Existing System

Is it still performing years later?

Inherited System

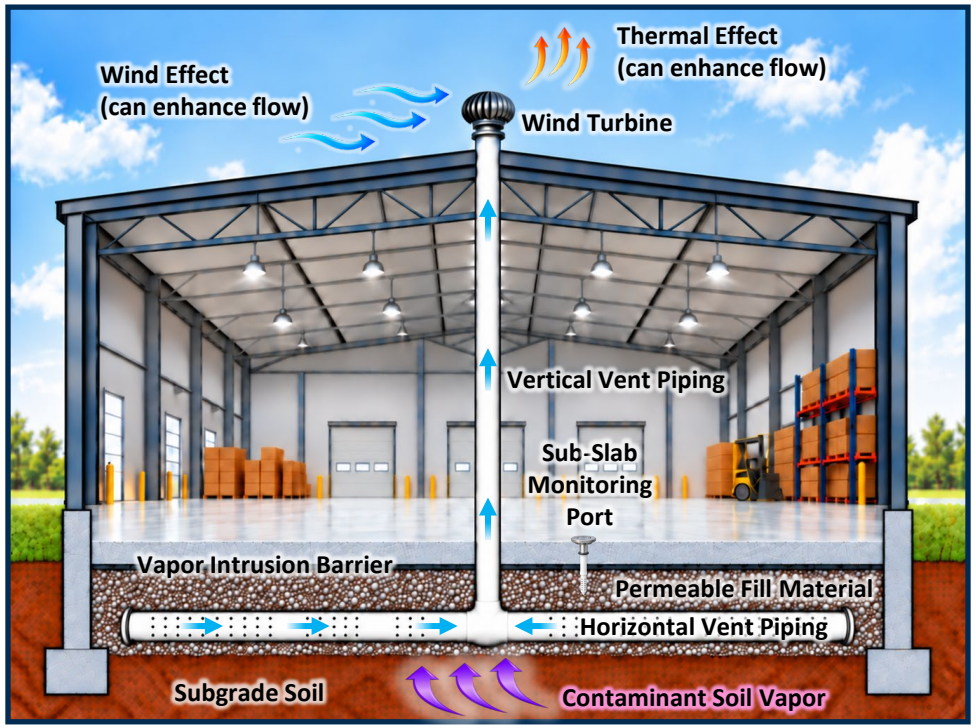
What if I wasn't there when it was designed or installed? What if the original team is gone?

Responsibility transfers instantly.
Knowledge of system performance may not.

Same Objective: Mitigate Vapor Intrusion

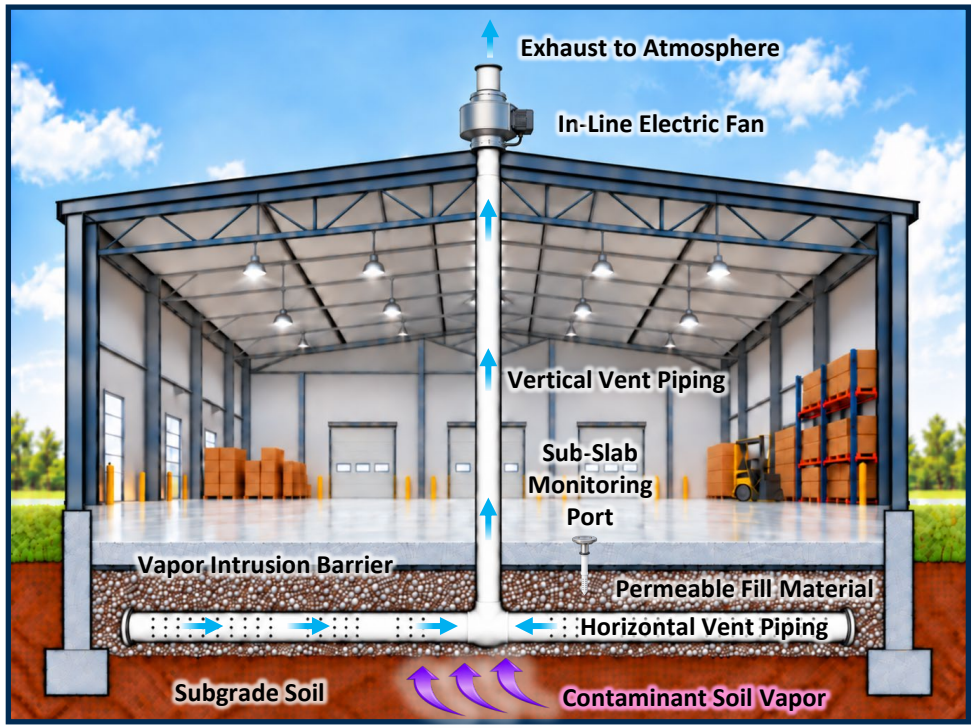
Passive Sub-Slab Ventilation (SSV)

Passive mitigation system (no electric fan)



Sub-Slab Depressurization (SSD)

Active mitigation system (uses electric fan)



Different Protection Strategies

What Does “Working” Mean?

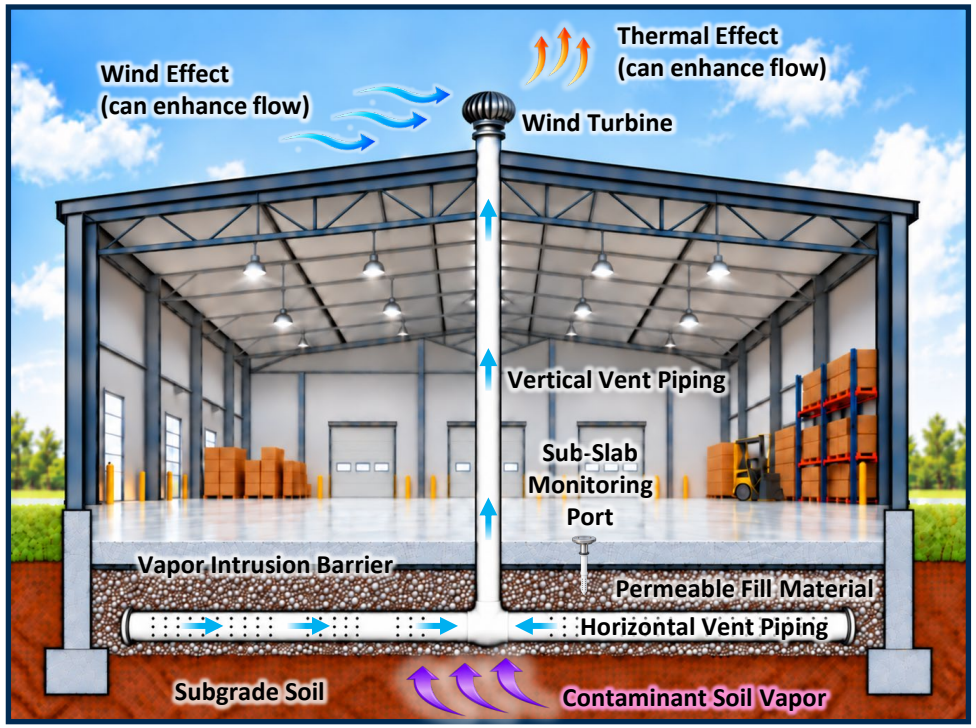
Both systems can be evaluated, but not in the same way

Questions	Passive SSV	Active SSD
Installation / Integrity *Was it constructed as intended?*	**Barrier + vent path** Connections, seams, penetrations, CQA	**Mechanical system** Piping, sealing, fan, monitoring points
System Function *Is the mitigation mechanism operating as intended?*	**Condition-dependent indicators** Vent/riser flow, sub-slab conditions	**Direct operating metrics** ΔP, pressure field extension (PFE), fan operation
Risk Control *Is the VI pathway adequately controlled?*	**Multiple lines of evidence** Indoor air / sub-slab data as needed	**Pressure field may establish control** Sampling as needed

A measurement can demonstrate risk control without demonstrating system function.

The Passive Verification Problem

What can I directly measure today?



- **Barrier Integrity**
  Critical, but largely inaccessible after slab placement. What if later work disturbed it? Was it repaired?
- **Passive Venting**
  Venting varies with conditions; a single visit may not be representative.
- **Risk Control**
  Sampling can show acceptable conditions without proving why.

I can often demonstrate acceptable conditions on a given day.
I cannot always demonstrate that the passive system is the reason.

Indoor-Air Sampling Answers a Different Question

Current conditions do not necessarily demonstrate system function



Acceptable Indoor Air

- *Passive venting is contributing?*
- *Barrier/slab alone is sufficient?*
- *Source strength is lower than assumed?*
- *Sampling/building conditions were favorable?*
- *Is the result representative beyond the sampling period?*

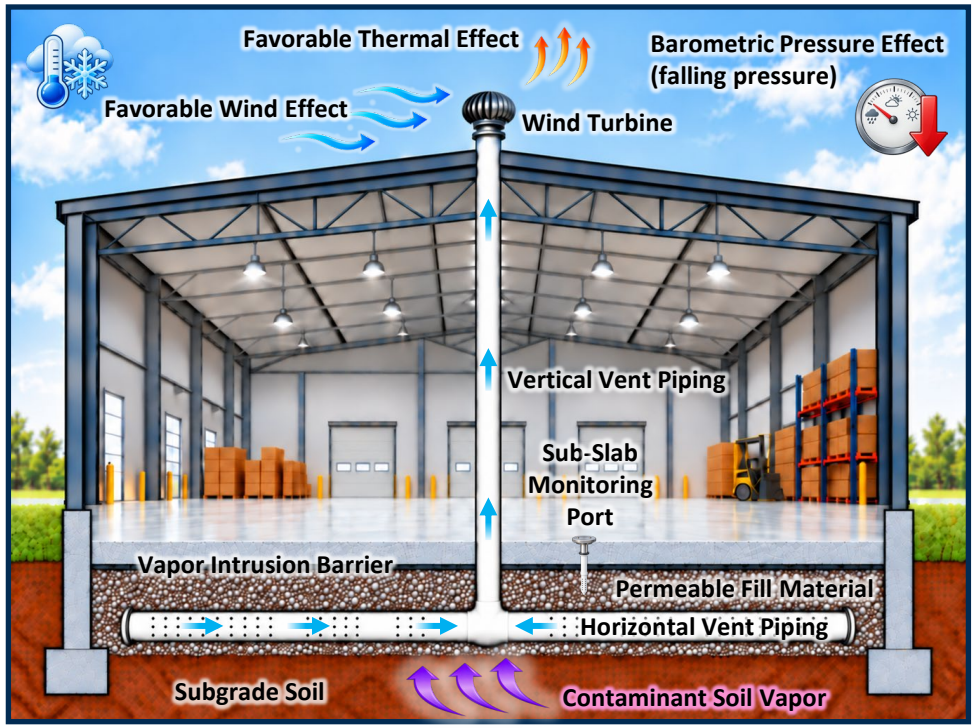
Unacceptable Indoor Air

- *VI despite mitigation?*
- *Indoor/background source?*

The result tells me the condition during the sampling period.
It may not tell me the cause or whether it is representative under other conditions.

Passive Venting Is Condition Dependent (Favorable)

The readings won't look the same every time I measure the system

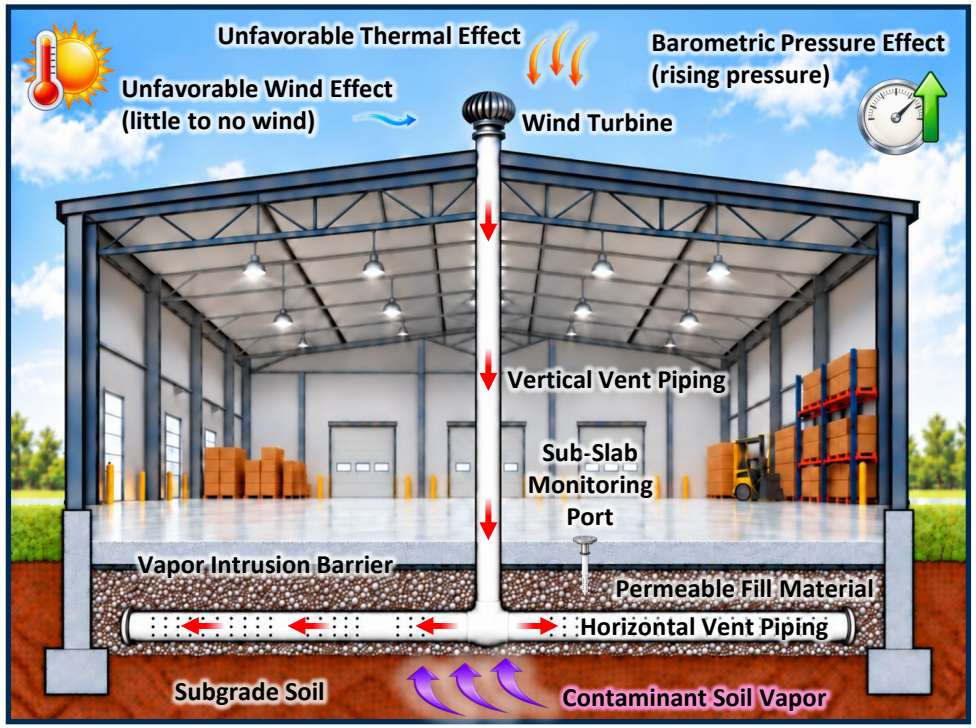


- Barrier is the continuous protective element.
- Natural forces can periodically induce venting, sometimes enhanced by a wind-driven turbine.
- A one-time measurement may not represent long-term behavior.

A favorable reading demonstrates operation under those conditions.
It does not characterize the system over time.

Passive Venting Is Condition Dependent (Unfavorable)

The readings won't look the same every time I measure the system



- Barrier is the continuous protective element.
- Natural forces can periodically induce venting, sometimes enhanced by a wind-driven turbine.
- A one-time measurement may not represent long-term behavior.

A passive system does not need to be venting continuously to function as designed.
An unfavorable reading at one moment does not, by itself, demonstrate failure.

Trying to Verify Passive System Venting

Can I demonstrate that the vent network is connected and moving air?



Induce a Response

- *Post-construction smoke testing*
- *Tracer / helium gas testing*
- *Pressure-response / airflow testing*
- *Simulating wind over vent stacks and wind turbines*

Evaluate Drivers and Response Over Time

- *Historical weather / barometric pressure analysis*
- *Continuous pressure monitoring / data logging*

Forced tests demonstrate an open pathway. Monitoring tracks pressure conditions.
Neither necessarily tells me how much the system is venting over time.

The Post-Construction Problem

Defects can be difficult or impractical to repair



Once the Slab Is in Place, Access Is Limited

- *What do I do when a venting test suggests a problem?*
- *What finishes or operations would a repair disrupt, if repair is even feasible?*
- *What if documentation reveals a later renovation with no documented system repair?*
- *If confidence depends on construction CQA, what if documentation is incomplete?*

If the evidence suggests a problem…
Then what?

One Building: Three Roles

An unusually complete view of a system's history



Consultant

↓

Corporate Tenant

↓

Owner/Developer

I knew this system from nearly every angle.
That level of continuity is rare.

Passive Performance Example

Rare case of unusually clear passive-system performance data



Methane % by Volume

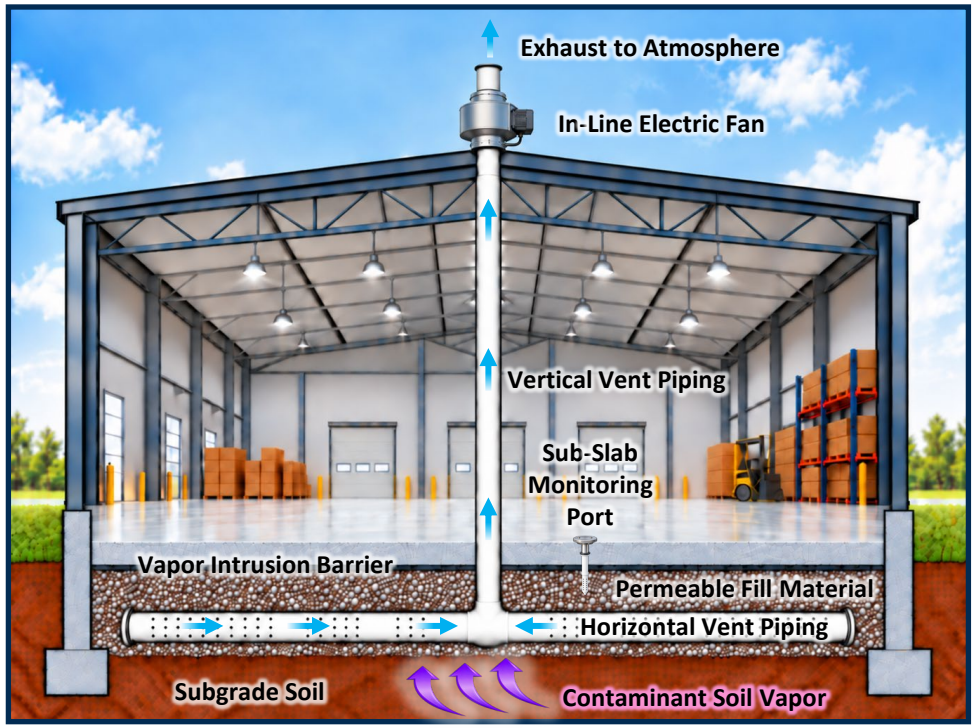
Sample Location	9/21/ 2021	10/25/ 2021	11/17/ 2021	3/14/ 2022
Vent Port A	**1.5%**	0.0%	0.0%	0.0%
Vent Port B	**1.1%**	**0.1%**	0.0%	0.0%
Test Port A	**29.2%**	**0.7%**	0.0%	0.0%

0.0% on subsequent monitoring events

Methane declined to 0.0% within two months.
Strong evidence of passive-system performance.

Active SSD Simplifies the Question

Does the pressure field meet the performance criterion?



Required Pressure Field Extension Achieved?

- *YES → Performing to spec*
- *NO → Investigate / adjust*

I can directly test whether the pressure-field criterion is met.
Whenever I measure it.

Lifecycle Cost Is More Than Fan Energy

The cheapest system to operate is not always the cheapest system to own

Passive SSV

- *No powered equipment*
- *Little or no energy cost*
- *Periodic inspection / testing*
- *Potential repeat sampling or investigation*
- *More effort to interpret performance*
- *Repairs may be difficult after construction*

Active SSD

- *Fan energy + eventual fan replacement*
- *Power loss / fan failure requires response*
- *Periodic inspection / monitoring*
- *Remote fan / pressure monitoring possible*
- *Direct performance verification*
- *Troubleshooting is more straightforward*

Energy is visible. Verification effort and uncertainty are costs too.

Why I Now Prefer Active SSD

What changed was my responsibility for demonstrating performance

Passive Systems Can Work

They can perform very well when properly designed, constructed, and maintained.

Active SSD Performance Is Easier to Verify

Pressure-field performance gives me a direct, repeatable operating metric.

Verification Has Lifecycle Costs

Energy and fan replacement are visible costs.

Uncertainty, testing, and interpretation are costs too.

Active SSD gives me the most direct answer to:
How do I know the system is working?

Thank you!

Mark J. Quimby, CEP
mquimby@ashleycapital.com

Questions?

References – VI Guidance

- Interstate Technology & Regulatory Council (ITRC). 2026. *Vapor Intrusion Toolkit (VIT-1)*.
- ITRC. 2026. *Passive Sub-Slab Ventilation Technology Information Sheet.* Vapor Intrusion Toolkit.
- ITRC. 2026. *Sub-Slab Depressurization Technology Information Sheet.* Vapor Intrusion Toolkit.
- ITRC. 2026. *Vapor Intrusion Mitigation System Construction Quality Assurance Fact Sheet.* Vapor Intrusion Toolkit.
- ITRC. 2026. *Vapor Intrusion Mitigation System Operation, Maintenance, and Monitoring Fact Sheet.* Vapor Intrusion Toolkit.
- ITRC. 2026. *Design and Implementation Considerations for Vapor Intrusion Mitigation Approaches Fact Sheet.* Vapor Intrusion Toolkit.
- U.S. Environmental Protection Agency. 2015. *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air.* OSWER Publication 9200.2-154.

References – Standards, Case Study & Graphics

- ANSI/AARST. SGM-MFLB-2023: *Soil Gas Mitigation Standards for Existing Multifamily, School, Commercial and Mixed-Use Buildings.*
- ANSI/AARST. CC-1000-2018-0523: *Soil Gas Control Systems in New Construction of Multifamily, School, Commercial and Mixed-Use Buildings.* Rev. 5/23.
- Project field monitoring records. *Building 3 methane monitoring data, 2021–2022 and subsequent monitoring events.* Unpublished project data.
- Project photographs and records: unpublished project materials. Photographs used with permission.
- Indoor-air sampling photograph: U.S. Environmental Protection Agency (EPA).
- Graphics: Illustrations and presentation graphics developed by the author with assistance from generative AI.