Vapor Intrusion systems comparison – Modulo VS Membranes

Barrier System	Typical Sub-Slab Components for VI System	Costs, per square foot	Range in Total System Costs[1] per square foot		Advantages	Disadvantages
Sheet Membrane	40 mil LLDPE membrane w/ 8oz geotextile	$3.00	**$4.10**		Better penetration resistance than spray-applied liners, better chemical vapor resistance than spray applied membrane	More lengthy to install. Post building construction repairs more difficult than spray applied membrane.
	Pipe Boots ($150 ea/penetration)[2]	$0.45				
	Geovent gas collection pipe[3]	$0.30				
	3 inch gravel membrane protection layer	$0.35				
Spray Applied Membrane	60 mil Liquid Boot w/protection fabric	$4.50	**$4.80**		Quick to install	Penetrations susceptible to damage, may absorb chlorinated solvents (swell) overtime, potentially increasing emissions.
	Geocomposite gas collection pipe[3]	$0.30				
Ventilated Floor	Ventilated Floor Blocks, 8 inches tall	$3.45	**$4.10**	**$3.25**	Provides for more effective gas collection system (easier to achieve vacuum distribution, small fan than other systems), 8 inch less sub- grade stone required. Potential to reduce slab thickness due to block structural properties (spread footing buildings only).	Requires additional sealing around penetrations following concrete slab cure. Post building construction repairs more difficult than spray applied membrane. Potentially less effective barrier during passive system operation.
	Additional concrete required due to block shape	$0.50				
	Penetration sealing after slab pour [2]	$0.15				
	Potential deduct for sub-grade stone savings	-$0.85				

Note:
[1] Costs for sub-slab portions of system.

[2] Assume 50 penetrations and 17,000 SF building Footprint

[3] Based on 25 foot row spacing and 17,000 SF building footprint