











According to the US EPA's model standards for radon control systems in new building construction, a means for collecting soil gas should be installed beneath the slab.

More and more mitigators and buildiers are using PDS' soil gas collector mat (SGC Mat) because its installation does not entail any special coordination with plumbers or other site contractors. Low profile mat saves time as it removes the need for trenching. Just lay radon mat down around the inside perimeter of the foundation, secure it with spikes or landscaping staples, and pour the concrete.

SGC mat is superior to other mat systems because of its thickness and it has a geotextile fabric cloth surrounding the entire mat material. This feature eliminates the need to lay a plastic barrier or sheet on top of the mat to protect the matrix. Using plastic sheeting can cause concrete cracking due to differential dewatering. The SGC Mat itself should not increase concrete cracking when a proper 4"+ slab is poured and installation instructions are followed correctly.

The full fabric design greatly enhances both the installation as well as the quality of the concrete slab. When SGC mat is installed below the slab, you're providing an airspace that intercepts radon--and other soil gases and vapors--before it seeps into the building through the slab. SGC mat also works well as a soil gas collector beneath crawlspace barrier due to its low-profile.

WHY AND HOW IT WORKS

PDS in conjunction with StrongSleeves™ has published a first-of-its-kind airflow study on our soil gas collector mat. Visit our website or email your rep for a copy.

The matting is a one inch high by twelve inch wide matrix enveloped in a geotextile filter fabric. 90% of the geomatrix is airspace, which means soil gas has room to move to the collection point. This creates incredible pressure field extension for post construction system activation. The mat can support concrete without compressing, yet is extremely lightweight and easy to handle. SGC mat has the equivalent airspace as 4" PVC pipe.

This system allows for radon to flow through the filter fabric and into the airspace. The airspace does not clog because the filter fabric retains the underlying gravel and soil. The natural airflow through the mat then channels the radon to the riser to pipe connection. From there, hazardous gas can be vented safely through the roof of the building.

With Alpha86-designed new EZ riser (05-141-EZ), you have 360 degrees of airflow and a fitting for both 3" and 4" PVC vertical stacks. Legacy model T risers still meet code requirements as they have redundant mat entry from two or more directions and exhaust to a vertical stack. Rest assured: PDS has the best riser options on the market.

MORE INFO ON TESTING





Note: Vapor barriers are required in many RRNC codes. Use of a vapor barrier above the geotextile mat will not hurt the radon system. It's simply not a requirement for proper function according to our instructions.

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INSTALLATION INSTRUCTIONS*

STEP ONE

Begin work on the sub grade (soil, sand, or gravel) after the final preparation and before the concrete is poured. Start with riser(s) and work out to ensure smooth mat placement. Position the riser(s) in appropriate location(s) and secure with nails or staples. Nails with washers work best with compacted soils. Staples work best with native fill or gravel.

STEP TWO

Using the preferred EZ riser**, core out a 5" diameter hole in the radon mat. Separate the top half of the riser from the bottom half by twisting the top gently in a counterclockwise motion. The top half of the riser should move approximately one inch and the two halves will slide apart. Sandwich the mat between the two halves of the riser and twist them back together. Lay the riser back down and use our lag screws with washer to secure them to the ground. Lag screws work best with compacted site soil. For gravel or loose soils, you may also try our riser nails.

STEP THREE

Mat is typically laid out in a rectangular loop in the largest area with branches or legs into smaller areas. Some codes require the mat to be no more than 20' away from itself. Get a free takeoff from us at www.radonmat.com or be sure to add runners for foundation areas where the walls are further than 20' apart.

There is no need to trench the mat so long as a full 4" slab is poured above. Trenching will not hurt the mat, but it is a needless labor expense. Roll out the SGC mat and smooth it onto the ground. To avoid wrinkles and buckling work away from the risers stapling to the ground as you go. The mat should be stapled every three to four feet, in addition to corners, tee junctions & ends. Radon mat should be installed between one and ten feet inside of the perimeter of the foundation. Use this leeway to avoid other plumbing lines and underground work.



Again, staples work best on uncompacted soil. Other soil types nails and washers work better. The goal is to ensure the mat does not float up in the concrete and makes a good connection with the soil.

STEP FOUR

Corners are constructed by peeling back the filter fabric, cutting two ends of the matrix at 45 degree angles, and overlapping the matrix 1/2" or more. Return the filter fabric in place, then tape to ensure no concrete can enter the corner splice. Staple across the joint of the matrix and each leg of the corner. Use a minimum of four staples at each corner-- two across the joint and one on each leg.

INSTALL VIDEO





*These are the manufacturer's instructions to ensure a proper functioning system. Certain code variants across the US have more lax or more conservative requirements. PDS' soil gas collector can be installed to meet any code requirement (as of publication of this document). Please reach out to PDS or a certified radon mitigator for consulting on specific code variants.

INSTALLATION INSTRUCTIONS

CONTINUED



STEP FIVE

The tees for branches and legs are constructed by slitting the fabric of the main loop at the location desired. Cut the fabric of the branch at the edges and expose two inces of the matrix. Cut off the exposed matrix and but the matrix of the branch (or overlap 1/2") to the matrix of the main loop. Pull the filter fabric of the branch back over the main loop and tape into place. Staple across joint of the matrix with two staples and one each on the branch and main loop. Use a minimum of four staples at each tee, two across the joint and one on each loop and branch.

STEP SIX

All openings in the fabric at joints, T's, and ends of branches should be taped to keep out concrete.

STEP SEVEN

Stub up a few feet of 3" or 4" schedule 40 PVC** from all risers before pouring concrete. Use silicone sealant and/ or PVC glue on the vertical transition; several screw holes are available as well. Stabilizers (05-141-SP3 & -SP4) are available to keep the vertical stacks plumb. Stabilizers wrap the PVC and are secured with a screw. Rebar is attached the stabilizer using a zip tie (not incl). From there, plumb your riser and hammer the rebar into the pad to hold the PVC in perfect position. **(6"risers are available). PVC sizes vary by code and design. 3", 4", & 6" schedule 40 PVC are acceptable. Consult your designer and ASNI/ AARST code for riser sizing & footprint requirements.

STEP EIGHT

When the building is ready for the vent pipe to be installed above the slab, fit to pre-stubbed PVC with PVC straight connect. Always label "CAUTION RADON REDUCTION SYSTEM" every 10 feet to avoid confusion on site and for the building occupants.



PDS 6" Legacy Riser shown

STEP NINE

Route PVC as straight as possible up through the interior of the building. Leave space for a radon fan in the attic or on the roof with 115V power within 6' of the PVC piping. Hide PVC in wall chase and sheetrock for best aesthetics and noise reduction.

STEP TEN

Step ten is the most crucial step. Have a certified professional TEST FOR RADON when the thermal envelope is complete and the HVAC system is running. Radon test results can be used to determine an energy efficient radon fan size.

NOTE: Footer crossing options are detailed on pages 8-10 of this document. It is important for the radon consultant designer to be aware of the pad condition during radon mat installation. If the pad is flat, no additional fittings are needed. However, if there will be trenches for a "monopour" then the rebar bridge method is recommended. If the pad will have intermediate footers that are pre-poured and elevated, these will block the mat from a level run across: <u>STRONG SLEEVES ™</u> must be installed prior to these types footer pours (see figure 5.4 of ANSI/ AARST CC-1000 free to view here).



MAKING CORNERS AND SPLICES

The geotextile mat should be routed around the inside perimeter of the foundation. This will require occasional corner junctions. Furthermore, splices will have to be made to join two lengths of mat together. Corners and splices are very easy to make, and do not require any special fittings. Cut back the filter fabric to reveal the core material.





In the case of a splice, merely overlap the core by at least one corrugation, replace the cloth, and tape it using PDS SGC seam tape. Use two landscape staples to hold the splice in place. In the case of a corner, peel back geotextile fabric and slice the core of the two adjoining legs at 45 degree angles which mirror each other; overlap the edges by one corrugation; return grey geotextile fabric, tape, and staple the corner together.

CONNECTING THE MAT





EZ risers (05-141-EZ) allow for airflow from all directions. Simply core out a 5" diameter hole using a hole saw, twist the EZ riser to separate the top and bottom halves. Then sandwich the mat between the EZ riser top and bottom halves, twist the riser back into place. Secure with 9/16" lags. May also be secured with T nails. If using T nails, be sure to use a rubber mallet and be careful not to strike the riser itself.

Securing the riser to the soil or aggregate keeps pressure field extension (PFE). It is imperative that concrete does not come between the radon mat or riser and the soil, aggregate, or substrate. Seal EZ riser using PVC glue, silicone caulk, or SGC Seam tape. The goal is to ensure no concrete may enter the riser or radon mat during pour. Older riser designs are acceptable if you follow past submittal installation instructions.

Use Pipe Stabilizers (05-141-SP3 & -SP4) which keep the vertical stack perfectly plumb while also serving as your first radon system label.

NOTE: Fitting colors may vary. This keeps costs low and does not affect system performance.





TRENCH & FOOTER CROSSING OPTIONS

STRONGSLEEVES.COM

STRONG SLEEVES

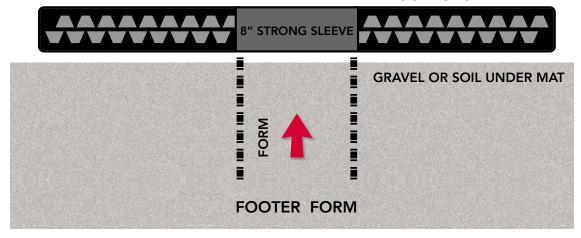


Multiple sizes available 8" - 12" SKUs: 05-139-S, 05-139-AS, 05-139-12

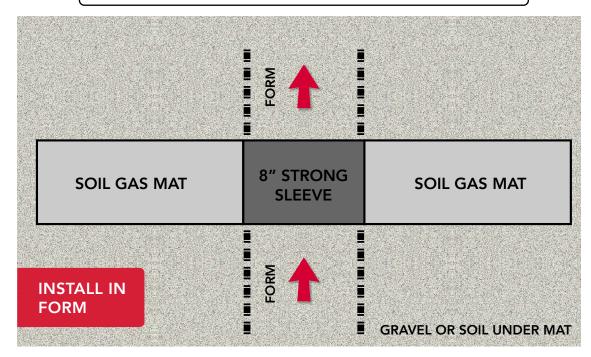
SIDE VIEW GOING THRU FOOTER/ INTERMEDIATE WALL

SOIL GAS MAT

SOIL GAS MAT



TOP VIEW GOING OVER FOOTER / WALL / TRENCH



*See misc drawings at end of guide for more information.

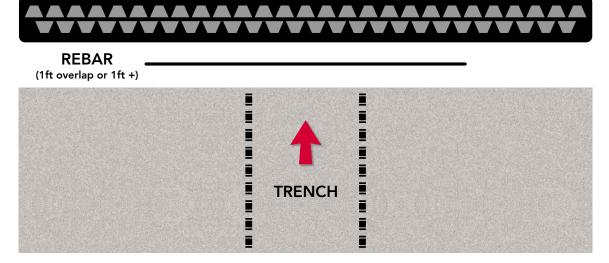
TRENCH & FOOTER CROSSING OPTIONS



REBAR BRIDGE METHOD

SIDE VIEW GOING THRU FOOTER

SOIL GAS MAT



Use common rebar to support radon mat as it crosses trenches for "waffle slab" "mono-pour" foundations (use a minimum of two lengths of rebar for support, three is preferred). Cut rebar pieces a minimum of 1 foot longer on each side of the trench. Sleeve inside fabric or below SGC mat and use SGC seam tape to ensure a secure fit. If installed correctly, radon mat will not rip, tear, or sag. New rebar bridge can support 100+ lbs of weight.

INSTALL VIDEO







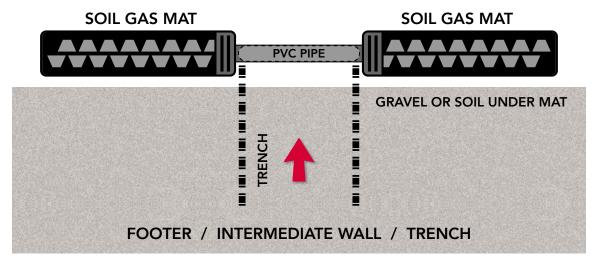
TRENCH & FOOTER CROSSING OPTIONS

ALPHA 86 FLAT OUTLET

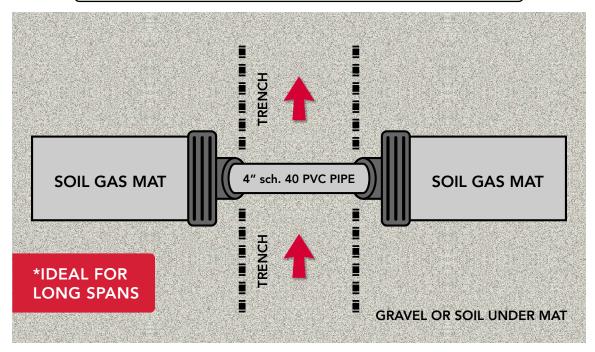
SKU: 05-141-3F

SGC TO PVC TRANSITION

SIDE VIEW GOING THRU FOOTER/ INTERMEDIATE WALL



TOP VIEW GOING OVER FOOTER / WALL / TRENCH



*Three feet or more

POURING CONCRETE





The filter fabric that comes sewn around the soil gas collector prevents the wet concrete from entering the mat and reducing its air collection capacity. The only precaution that needs to be taken is that the fabric is taped closed at seams of splices and corner to sufficiently keep the uncured concrete from entering.

The mat also needs to be secured to the soil with landscape staples to prevent the concrete from lifting off the soil while it is being applied. Re-enforcing bars and wire can be laid on top of the mat.

Note: the mat is strong enough (4,300 psf) to withstand concrete workers and their wheel barrows.





RADON RISK!

RADON-INDUCED LUNG CANCER CLAIMS THE LIVES OF OVER <u>22,000 AMERICANS</u> EACH YEAR

FACT: Radon is found at dangerous levels in all 50 US states. The EPA action level is 4.0 pci/L or higher

FACT: All US Homes have high radon potential, even those without basements

FACT: Radon is the leading cause of lung cancer among "never smokers"

FACT: Radon is a noble gas and a natural part of the Uranium 238 breakdown chain

FACT: Breathing 6.2 pci/L is the equivalent radiation dosage of a THREE chest x-rays each week for your lungs

FACT: Radon is colorless, odorless, and invisible to the naked eye

FACT: Radon testing is cheap and you can do it yourself!

GET THE FACTS @ WWW.RADONREALITY.COM

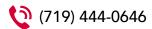
RBOUT US PROFESSIONAL DISCOUNT RADON SUPPLY



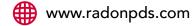


Established in 1989: Family-owned and operated since 1996. Situated on Colorado's front range, PDS focuses on generating radon awareness through one-on-one technical support and trouble-shooting. Our products have been successfully installed in all 50 states and several foreign countries.











Distribution opportunities available. Please call for availability in your market



PRODUCT MATERIALS SAFETY INFORMATION

SOIL GAS COLLECTOR MAT

Safety data for our non-woven, spun-bonded, polypropylene, gray geotextile fabric is shown below.

RECOMMENDED MAXIMUM OCCUPATIONAL EXPOSURE LIMITS

COMPONENT

CAS NO.

EXPOSURE LIMITS OSHA - PEL.

HAZARD DATA

Polystyrene

9003-55-6

None Established

No hazardous Ingredients

PHYSICAL DATA

PROPERTIES	DATA
Form	Molded Sheet
Color	Black
Odor	None
Boiling Point	Not Applicable
Melting Point (°F)	270
Flash Point (°F)	Not Applicable
Flamable Limits (°F)	Not Applicable
VAC	0%
Volatility	<0.75% Moisture
Specific Gravity	1.02–1.08
Solubility in Water	Not Soluable

MADE IN THE USA

FIRE HANDLING MEASURES

PROPERTIES	DATA
Extinguishing Media	Water Spray (except when fire is of electrical origin), Foam, Dry Powder, CO2
Fire Fighting Procedure	Self-contained breathing apparatus & suitable protective equipment

ECOLOGICAL INFORMATION & DISPOSAL

PROPERTIES	DATA
Ecological information	Not associated with any known ecological problems
Toxicological	No negative effects on humans
Disposal	Polystyrene recycles well. Can be disposed of as solid waste or burned in a suitable installation subject to local regulations. Effluents disposal should also be in accordance with local legislation.

PERFECT FOR RADON CONTROL SYSTEMS IN NEW HOME CONSTRUCTION



The economical alternative to aggregate systems—quick and easy installation

PHYSICAL DATA

PROPERTIES	DATA	
Stablitity	Stable	
Incompatibility (Materials to avoid)	Can react with strong oxidixers	
Hazardous Decomposition	Carbon dioxide, carbon monoxide, various hydrocarbons	
Conditions to avoid	None	

SPECIAL HANDLING INFORMATION

DESCRIPTION	INFORMATION
Handling & Storage Precaution	Protect against flame & intense heat. Avoid breathing hot vapors.
Eye Protection, Recommended	Use OSHA approved safety glasses when handling.
Skin	Wash with soap & water. Get medical attention if irritation develops or persists.
Other Clothing & Equipment	Gloves recommended due to sharp edges.
Work Practices, Hygiene	Use standard work practices for hygienic safety.
Handling & Storage, Other	Store in well-ventillated area. Avoid extreme heat & sources of ignition or open flame.
Protective Measures, Maintenance	Not Applicable



To the best of our knowledge, the information presented herein is accurate. However, it is not a warranty or a guarantee and is provided for reference only.



PRODUCT DATA SHEET

SOIL GAS COLLECTOR MAT

SKU: 05-140-3 (replaces SKU 05-140-1)

Safety data for our non-woven, spun-bonded, polypropylene, gray geotextile fabric is shown below.

MATERIAL PHYSICAL PROPERTIES

CUSPATED PLASTIC

PROPERTY	TEST METHOD	VALUE
Specific Gravity (g/cc)	ASTM D-792	1.04
Melt Flow @ 200°C/5000g (g/10 min)	ASTM D-1238	2.5
Tensile Strength @ Yield (psi)	ASTM D-638	2,900
Tensile Modulus (psi)	ASTM D-638	275,000
Elongation @ Break (%)	ASTM D-638	70
Flexural Modulus (psi)	ASTM D-790	300,000
Impact Strength, Notched Izod @ 73°F (ft-lb/in)	ASTM D-256	2.1
Heat Deflection Temperature @ 264 psi (°F)	ASTM D-648	183
Vicat Softening Point (°F)	ASTM D-1525	210

COVER FABRIC

PROPERTY	TEST METHOD	VALUE
Grab Tensile (lbs)	ASTM D4632	130
Elongation (%)	ASTM D4632	> 50
Trapezoid Tear (lbs)	ASTM D4533	60
Puncture (lbs)	ASTM D4833	41
Mullen Burst (psi)	ASTM D3786	140
AOS (U.S. sieve number)	ASTM D4571	70
Permittivity (sec-1)	ASTM D4491	0.8
Permeability (cm/sec)	ASTM D4491	0.04
Water Flow (gal/min/sf)	ASTM D4491	60
UV Stability (%)	ASTM D4355	70

PERFECT FOR RADON CONTROL SYSTEMS IN NEW HOME CONSTRUCTION



The economical alternative to aggregate systems—quick and easy installation

MATERIAL PHYSICAL PROPERTIES

CONTINUED

BINDING METHOD

PROPERTY	TEST METHOD	VALUE
External Binder	Standard	Sewn
Type Stitching	Standard	Lock Stitch
Type Thread	Standard	HB92 Nylon
Tensile Strength (lbs)	ASTM D4632	11
Thread Gage	Standard	2 IOx4 denier
Chemically Impervious	Standard	MI Natural



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PRODUCT MATERIALS SAFETY INFORMATION

SOIL GAS COLLECTOR MAT

Safety data for our non-woven, spun-bonded, polypropylene, gray geotextile fabric is shown below.

RECOMMENDED MAXIMUM OCCUPATIONAL EXPOSURE LIMITS

COMPONENT

CAS NO.

EXPOSURE LIMITS OSHA - PEL.

HAZARD DATA

Polystyrene

9003-07-0

None Established

No hazardous Ingredients

PHYSICAL DATA

PROPERTIES	DATA
Form	Molded Sheet
Color	Black
Odor	None
Boiling Point	Not Applicable
Melting Point (°F)	270
Flash Point (°F)	Not Applicable
Flamable Limits (°F)	Not Applicable
Auto ignition temperature	Not Applicable
Vapor Pressure (Pascal)	Not Volatile
Density (g/cm3) @20 °C	0.91
Solubility in Water	Not Soluable
Thermal decomposition (°F)	Above 570

FIRE HANDLING MEASURES

PROPERTIES	DATA
Extinguishing Media	Water Spray (except when fire is of electrical origin), Foam, Dry Powder, CO2
Fire Fighting Procedure	Self-contained breathing apparatus & suitable protective equipment

ECOLOGICAL INFORMATION & DISPOSAL

PROPERTIES	DATA
Ecological information	Not associated with any known ecological problems
Toxicological	No negative effects on humans
Disposal	Polystyrene recycles well. Can be disposed of as solid waste or burned in a suitable installation subject to local regulations. Effluents disposal should also be in accordance with local legislation.



PERFECT FOR RADON CONTROL SYSTEMS IN NEW HOME CONSTRUCTION



The economical alternative to aggregate systems—quick and easy installation

STABILITY & REACTIVITY

PROPERTIES	DATA	
Stablitity	Stable	
Incompatibility (Materials to avoid)	Can react with strong oxidixers, base, or acid	
Hazardous Decomposition	Carbon dioxide, carbon monoxide, low molecular weight oxygenated organic	
Conditions to avoid	None	

SPECIAL HANDLING INFORMATION

DESCRIPTION	INFORMATION	
Handling & Storage Precaution	Avoid breathing hot vapors, oiled mists, and airborne fibers.	
Eye Protection, Recommended	Use OSHA approved safety glasses when handling rolls	
Skin	Wash with soap & water. Get medical attention if irritation develops or persists.	
Other Clothing & Equipment	Not applicable	
Work Practices, Hygiene	Use standard work practices for hygienic safety.	
Handling & Storage, Other	Store rolls In accordance with good material handling practice.	
Protective Measures, Maintenance	Not Applicable	



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PRODUCT MATERIALS, TECHNICAL SPECIFICATIONS & PERFORMANCE

SOIL GAS COLLECTOR MAT

Our non-woven, spun-bonded, polypropylene, gray geotextile fabric with the minimum values shown below.

PROPERTY	TEST METHOD	VALUE
Grab Tensile Strength (lbs)	ASTM D4632	130
Elongation (%)	ASTM D4632	>50
Trapezoid Tear (lbs)	ASTM D4533	60
Puncture (lbs)	ASTM D4833	41
Mullen Burst (psi)	ASTM D3786	140
AOS (U.S. sieve no.)	ASTM D4571	70
Permittivity (sec-1)	ASTM D4491	0.8
Permeability (cm/sec)	ASTM D4491	0.04
Vertical Water Flow Rate (gal/min/sf)	ASTM D4491	60
UV Stability (%)	ASTM D4355	70



PRODUCT MATERIALS, TECHNICAL SPECIFICATIONS & PERFORMANCE



PROPERTY	TEST METHOD	VALUE
Specific Gravity	ASTM D-792	1.04
Melt Flow (g/10min)	ASTM D-1238	2.5
Tensile @ Yield (psi)	ASTM D-638	2,900
Tensile Modulus (psi)	ASTM D-638	275,000
Elognation @Break (%)	ASTM D-638	70
Flexural Modulus (psi)	ASTM D-790	300,000
Notched Izod @ 73°F (ft-lb/in)	ASTM D-256	2.1
HDT @ 264 psi (°F)	ASTM D-648	183
Vicat Softening Point (°F)	ASTM D-1525	210

Ver. 3/1/2023



1. Product Name

Model SSK-08

2. Manufacturer

Strong Sleeves™ LLC 10 Town Plaza, #444 Durango, CO 81301 www.strongsleeves.com



3. Product Description

Uses: Strong Sleeves[™] are installed when forming concrete structural supports, creating a continuous pathway for effective soil gas collection systems. In accordance with the Drawings, the pre-manufactured Strong Sleeve devices allow radon mitigation mats to easily be continued through concrete grade beams and concrete stem walls without transitioning to round pipe.

Advantages: Strong Sleeves are designed and engineered for safer construction of new residential, commercial, and school buildings by eliminating extensive trenching and specialized gravel fill materials.

4. Installation

- a. Install at elevations and locations shown on the Drawings or as otherwise directed by the Archi tect. Coordinate all locations with the Structural Engineer to confirm that the block-out locations through the grade beams and stem walls have sufficient structural strength and adequate reinforce ment.
- b. Attach the Sleeve to the interior walls of the concrete forms using the (4) pre-drilled holes in each Sleeve unit. Adjust steel reinforcement as directed by the Structural Engineer for wall or grade beam penetrations.
- c. After pouring concrete and removing concrete forms, remove the foam insert within each Sleeve. Use mechanical means only, DO NOT USE SOLVENTS TO DISSOLVE THE FOAM. Using solvents (such as gasoline) to remove the foam blocking may damage radon mitigation equipment and may lead to the risk of fire.

5. Availability and Cost

Strong Sleeves[™] are available through our network of specialty radon supply distributors. For current cost information and availability contact Radon PDS www.radonpds.com.

Product Details

Ver. 3/1/2023



6. Hazards and Exposure Controls

This product is exempt from hazard classification according to OSHA Hazard Communication Standard, 29 CFR 1910.1200.

This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. No engineering controls or personal protective equipment (PPE) are necessary.

7. Materials Data

Each Sleeve shall be constructed of a minimum of 22 gage galvanized sheet steel according to the sizes shown on the Drawings.

PROPERTY	COMPONENT
Appearance:	Metallic
Physical State:	Solid
Solubility in Water:	Insoluable
Melting Point:	2,372~2,800 °F
Specific Gravity (water = 1):	7.5~8.5
Odor:	Odorless

8. Warranty

Strong Sleeves LLC shall guarantee the Sleeve components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The cost of the replacement or repair of the Strong Sleeves shall be limited to the cost of the Strong Sleeve products supplied. The use of Sleeves shall be limited to the application for which they were specifically designed.

9. Technical Services

Technical advice, custom CAD drawings, custom Sleeve sizing, and additional information can be obtained by contacting Strong Sleeves or by visiting the website.



