

# The Unprotected Home

By: Peter A. Craig - FACI, FICRI, CCSMT



Upward Moisture Migration from the Ground

Each year homeowners spend hundreds, if not thousands of dollars on home security systems to protect their property and belongings from intruders.

There are however other types of intruders that can easily result in extremely costly losses or health concerns for a homeowner that home security systems do not detect. The intruders are moisture and radon gas. Moisture entering the structure from below can lead to floor covering failures, product damage, and mold. Exposure to radon gas has been linked to a number of serious health concerns including lung cancer.

For many years the installation of an effective below-slab vapor retarder has either been deemed not necessary in residential home construction, or that the added cost would put the builder at a competitive disadvantage. However, the cost of failing to protect a home from moisture and radon migration runs into hundreds of millions of dollars each year in America alone. The historical push backs to installing an effective, low-permeance, E1745 compliant below-slab vapor retarder, directly below the slab, are being re-examined for residential home construction.

First of all there is the mistaken belief that if a home is being built in a dry region of the country, or that the water table is well below the home, a vapor retarder is not needed. Both of these beliefs are false. It is a scientific understanding that the relative humidity in the ground below every home will essentially reach 100% once the home covers the ground, and it does not matter if the water table is 6 feet below the lowest level of the home, or 1006 feet below. This belief was published many years ago by the National Academy of Sciences and construction defect and failure investigations have proven this belief to be true time and time again.

As it relates to the construction of a new home that will have any type of resilient floor covering material installed, the use, and placement of an ASTM E1745 below-slab vapor retarder is not optional.

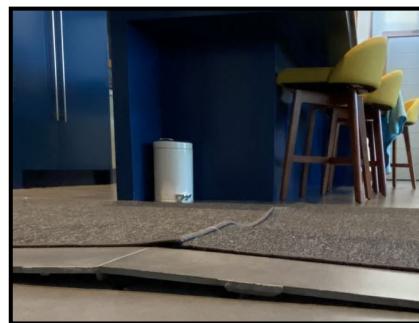
It needs to be understood that many local and national building codes are seriously outdated and may still reference generic 6 mil polyethylene as an acceptable below-slab vapor retarder. The builder needs to be aware that generic 6 mil poly is not an acceptable choice today for below-slab moisture protection. Six mil generic poly does not meet the requirements of ASTM E1745.

ASTM F710 is the flooring industry's: "Standard Practice for Preparing Concrete Floors to receive Resilient Flooring". In Section 6.2 of the document it states the following:

6.2 The installation of a permanent below-slab vapor retarder meeting the minimum performance requirements of Specification E1745 is required for all new on-, or below-grade concrete floors over which resilient flooring materials are to be installed. The use of such a material, provided that its integrity has not been compromised, retards the ingress of moisture from the ground which otherwise can increase moisture levels within the concrete which in turn can lead to flooring and adhesive problems. For resilient flooring installations the vapor retarder is to be installed in direct contact with the underside of the slab.

If a new home being constructed has any type of resilient flooring material to be installed over a concrete slab-on-ground the installation of an ASTM E1745 compliant below-slab vapor retarder is not optional. While there can be other reasons that a resilient flooring installation develops problems, if the below-slab vapor retarder requirement is not followed, and a flooring failure develops, the builder will likely be found responsible for the costs associated with the failure.

While ASTM F710 deals specifically with resilient flooring, other types of flooring materials such as wood, carpet, and tile also need to be protected by an effective, below-slab vapor retarder installed directly below the slab.



The issue of cost is always an important consideration. However, the direct and in-direct costs associated with a flooring failure, mold, or radon mitigation, can run into tens of dollars per square foot, not counting the legal entanglements that may ensue. With such a potential loss of time, money, and reputation, it is hard today to understand why any builder would not want to provide a truly effective level of below-slab moisture and radon protection in the homes they build.

Building and/or marketing a home that is protected by high quality, below-slab vapor retarder products such as offered by Stego Industries, would seem to provide a competitive advantage that should easily offset the relatively small additional cost of purchasing and installing a truly effective below-slab vapor retarder.

It needs to be considered that there is but one chance to install an effective below-slab vapor retarder and that is before the concrete floor slab is placed.



**Comment:** There will likely be residential concrete contractors that will try and talk a builder out of installing a below-slab vapor retarder, or request that they be allowed to place a granular fill material over the vapor retarder. While a number of valid concrete related concerns can be raised, all of them can be addressed and overcome with proper, knowledgeable, concrete placement practices.

As for placing a fill material over the vapor retarder, the practice is no longer permissible as it has been found to effectively negate the effectiveness of the vapor retarder.

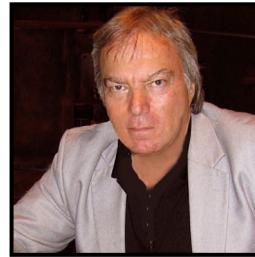
#### About the Author:

The Personal Profile of Peter A. Craig is shown on the following page:

# Personal Profile:

## Peter A. Craig - FACI, FICRI - Concrete Floor Specialist

**Concrete Constructives** - 207-650-3979 - [pcfloors@msn.com](mailto:pcfloors@msn.com)



Peter Craig has over 52 years experience with specialized aspects of concrete construction, maintenance, and repair. He also has over 40 years experience investigating and providing solutions to defects and failures of concrete floor slabs, floor coverings and coatings... In addition to providing consulting and forensic services Mr. Craig's experience and industry involvement includes:

### Professional Affiliations:

#### **International Concrete Repair Institute ( ICRI )**

- 1996 National President -2000 -Received ICRI Fellowship Award – 2014 Received Distinguished Service Award
- ICRI Concrete Moisture Testing Certification Program sub-committee chairman and course instructor.

#### **American Society for Testing & Materials (ASTM )**

- Voting Member Committee F-6, Resilient Flooring - Voting Member Moisture Task Group, E06.21.08
- Current document leader for ASTM F1869 and ASTM F2170
- November 2014-Received ASTM Award of Appreciation for establishing an ILS for Test Method F2170

#### **American Concrete Institute (ACI )**

- Voting member ACI Committee 302 “Guide for Concrete Floor and Slab Construction”
- Voting member ACI Committee 360 “Design of Slabs on Grade”
- Faculty member/presenter 2008, 2009 ACI Construction of Concrete Slabs seminar series.
- Current Chairman; ACI 302.2R sub-committee: “Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials”.
- 2013 Received ACI Fellowship Award

1996- 2004 Co-Chairman ACI Committee 302 & 360 Moisture Task Group studying and reporting on moisture related floor and vapor retarder issues.

1992- 1997 Instructor for the NNECPA sponsored ACI Flatwork Certification Program

Former member of the ACI sanctioned Maine Concrete Technicians Certification Board (MCTCB)

#### **Construction Specifications Institute (CSI )**

- National Member 1990 - 2020
- Officer of the Maine Chapter 1990 -2000

### Publications, Technical Presentations and Project Involvement:

Sixteen nationally published articles, 5 reference articles, and 5 video lectures ([www.FixConcrete.org](http://www.FixConcrete.org)).

Guest speaker at over 150 technical conferences and meetings over the past 20 years.

2008-09 Contributing Editor Concrete Surfaces Magazine

Jan 2012 - Voted one of the 5 most influential people in the concrete industry- Concrete Construction Magazine.

Project involvement with over 400 flooring, floor coating, and sweating slab issues nationwide.

### Notable Presentations:

World of Concrete –25 Programs from 1997 - 2025  
International Surfaces Event Programs 2007 - 2018  
American Sports Builders Assoc. 2007 Austin, TX  
International Surfaces Event Programs 2007 - 2018  
Build Boston Presentations- 2003 & 2004  
CSI National Convention, 2004, Chicago, IL

Ontario Association of Architects - Oct 2012  
U of Wisconsin at Madison Seminars 1999 & 2000  
American Concrete Institute, Vancouver, BC 2003  
Structural Engineers of Texas, Dallas 2003  
Construct CSI 2008 – 2009 – 2017-2018  
ConExpo / ConAgg - 2005 Las Vega