

### ***Details of proposed Variance: Using the Polycore RFloor in place of a poured basement slab***

There are two areas of functional performance required to meet or exceed that which is contained in the National Building Code – 2019 Alberta Edition:

The first requirement is placement of a barrier with a sufficiently low permeability rate to prevent the passage of radon gas or other soil gasses. The major tenant of the RFloor alternate solution is to place a continuously laid 6 mil polyethylene film just below the wear surface. Both the prescriptive solution and this alternative rely upon the permeability of the poly to resist the Radon Gas from moving through the basement floor into the livable space. Polyethylene meets the Canadian equivalent of the ASTM E1745 – 17 standard which passes the E154/E154M (Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover). Any material below this film does not really matter. Subterrain gases will pass up through the clay and or other soils compacted in situ some 10,000 years ago by the glaciers, and any soil or granular materials placed under the 6mil poly layer will not stop the gasses movement into a collection layer.

The second requirement to meet the intention of the Code is to provide a path for the collection and extraction of any soil gas that may build up under the impervious layer of polyethylene. The Polycore RFloor system provides a grid of voids immediately below the poly layer which enable any gas to travel without impediment to an ABS 100mm (4 inch) ID capped protrusion located above the elevation of the finished floor. This grid system is a vast improvement to the prescriptive design of a polyethylene layer laid over gravel. On gravel, there is a huge possibility of poly being damaged by workers who have to trod upon the thin film of poly over a rough gravel surface in order to pour and screed the semi-solid concrete. Additionally, prescriptive slabs by code require 2% minimum steel reinforcing. This steel has to be in place within the finished floor section at a minimum 38 mm above the bottom of the concrete, and to do so it is either lifted into place with a steel hook or is placed on steel “high hats”. If a worker steps on the steel, “high hats” will punch through the poly and improper use of hooks will puncture the poly, either situation defeating the purpose of the poly in the prescriptive solution.

A third desired, and soon expected to be a required, intention of the code is the provision of insulation for energy efficiency. The prescriptive solution does not require any significant amount of below slab insulation to prevent heat loss into below slab soils and even in cases where such performance may be desired it is often excluded due to cost/depth of floor excuses. The Polycore RFloor assembly provides an insulation value of R19.97 (RSI 3.517) without added depth or costs, making this alternative a better performing system that generally installs faster, easier, and for less cost than the prescriptive systems.

For additional details and background, the following documents are available from the manufacturer:  
(S I Construction Systems, Edmonton Alberta via [sicsys1@gmail.com](mailto:sicsys1@gmail.com), or 780-450-2584)

- RFloor and General overview letter Oct 16, 2020
- Drawing “Design of RFloor System for Radon Collection”
- Install manual “Floor Panel with Radon – Basic Instructions”