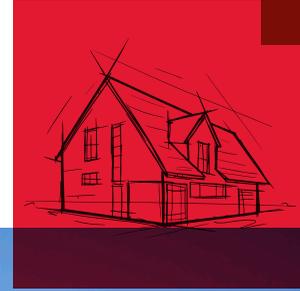


# Doug Tarry Homes Optimum Basement Wall

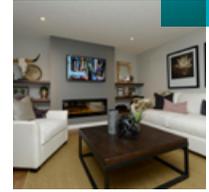
Case Study



Doug Tarry Homes, based out of St. Thomas Ontario, is a premium custom home builder with a mandate to build quality homes. They focus not just on the quality of the finishings but on the quality of the construction and its components long after the keys are handed over to the customers. Doug Tarry Homes is an award winning home builder - recently acquiring three new 2013 Canadian Home Builder National SAM Awards to add to the collection.

After investigating concerns about water build up on the poly that could indicate leaking in the basement, the Doug Tarry Homes team recognized that this issue was not a leaking basement, but a condensation issue due to the performance of the basement wall and that this was not an uncommon problem. In fact it is quite common, happening in many new homes across the province due to similar wall assemblies that meet and, at times, exceed code.

A great deal of research and field testing was conducted by the company to learn about the challenges of controlling vapor diffusion in a basement wall assembly and about how the basement wall needs to work differently during the summer than it does during the winter. Doug Tarry Homes engaged with leading building science educators including Gord Cooke, Dr. John Straube and John Godden to develop the Better Basement Wall, and ultimately the Optimum Basement Wall.



**Assembly Details:**

- Foundation wall
- ROCKWOOL COMFORTBOARD™ 80 1.5"
- ROCKWOOL COMFORTBATT® 3.5"
- Vapor Barrier
- CertainTeed MemBrain™ Smart Vapor Retarder
- Drywall



ROCKWOOL insulation was chosen to be included in the Better Basement Wall, and ultimately the Optimum Basement Wall, because of its performance and ability to address the issues of slumping, thermal bridging and mould growth in the wall assembly.

Based on the performance review of the Better Basement Wall, another aspect of the Optimum Basement Wall was to bring the air barrier to the warm side of the wall and use the poly as a combination Air/Vapor Barrier. The other step was to change out the top portion of the poly with a breathable Smart Membrane to permit the summer vapor migration to dry through the wall into the conditioned basement. After consulting with our Chief Building Official Leon Bach, he permitted us to try a new wall design as an Alternative Compliance to the Building Code. The concept of the Optimum Basement Wall was to create a more forgiving wall system which has four basic principles.

## 4 Principles of the Optimum Basement Wall

**1. Limit the ability for water to enter the wall.**

- This will allow the wall to dry over time.

**2. Use of materials that won't trap moisture.**

- ROCKWOOL Insulation allows vapor to flow through without collecting.
- ROCKWOOL Insulation holds its shape (no slumping or cold spots).

**3. Change the location of the Air Barrier.**

- Vapor Barrier also functions as an Air Barrier.
- Bringing the air barrier to the warm side of the insulation reduces air and vapor flow into the wall cavity during the wintertime.

**4. Allow drying paths for moisture migration.**

- Any vapor that does enter the wall assembly and condenses can migrate down and under the floor slab.
- Summertime inward bound vapor migration is allowed to escape through the smart membrane installed on the top portion of the Air/Vapor Barrier.
- The combination of ROCKWOOL vapor permeable insulation and a smart membrane allow for vapor to escape, mitigating condensation buildup.





**The materials within the wall assembly were evaluated, performance tested, re-evaluated, removed, changed and reassembled. Along the way performance issues were identified:**

- Frosting and ponding (vapor freezes on the frozen concrete wall and then leaks out onto the basement floor when the weather warms up)
- Slumping (insulation gets saturated with moisture and sags leaving gaps at the top of the wall with little or no insulation)
- Thermal bridging (cold spots in the wall where the insulation was not continuous, such as behind the studs)
- Trapped vapor and mould growth (Moisture being trapped behind the poly and in the insulation creating an ideal place for mould to grow within the wall).



In early October 2013, Doug Tarry Homes opened their latest Discovery Home in St. Thomas, Ontario. This home features two major pilot projects, one of which is the Optimum Basement Wall. This wall was constructed and closed in during the July heat wave while the drywall was being installed upstairs, adding a large volume of additional moisture into the home at the same time as there was no dehumidification or air conditioning running in the home and the wall performed beyond expectations.

In order to prove the performance of the Optimum Basement Wall, Doug Tarry Homes partnered with ROCKWOOL Insulation and George Brown College to study the home as part of the Argile Project through one full heating and cooling season. In addition, a renovation detail was designed to modify the Better Basement Wall for clients that were having vapor build up on the poly during the summer. This detail was completed by Doug Tarry Homes for more than a dozen customers who saw immediate results in the performance of their basement.

Moving forward, Doug Tarry Homes and ROCKWOOL are partnering with leading building science experts to educate builders, renovators, building officials, warranty programs, and code planners about the need to rethink the design of basement wall systems. Optimum Basement Wall system details have been created for builders, as well as renovators, for both R14 and R20 basement walls so that homeowners can have basements that meet their expectations.

**ROCKWOOL**

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ROCKWOOL Insulation is used extensively throughout the home. It is an integral component in this healthy home approach and adds a continuous insulation to the building envelope.