DELTA®-FOOTING BARRIER White Paper

DELTA®-FOOTING BARRIER is a 3-ply sheet membrane containing a polyester needle punched fabric, a polyethylene barrier, and an anti-slip surface layer. Its primary purpose is to act as a capillary break between the footing and the foundation wall to prevent the capillary rise of moisture.

Background

In 2006, the Ontario Building Code defined energy efficiency and resource conservation as legislative objectives. In keeping with those objectives, the Building Code began to require basements to be insulated to their full height as of January 1, 2009. This is because basements can be identified as one of the major sources of heat loss in a house.
While these code changes have taken place in Ontario (Canada), the dynamics of moisture movement through footings and foundation walls remain the same no matter where the building is located.

Technical Issues

The primary issue is capillary rise of water. Concrete absorbs moisture. The moisture continues to move through the concrete's micro pores and fissures from the wet areas to the dry. This happens without regard to gravity and continues so long as there is a source of moisture. The phenomenon is also known as capillary wicking because the moisture will move up through the concrete in the same way that kerosene moves up through the wick in a lantern.
When the footing for a home is poured, it must be poured directly on undisturbed soil. This is a building code requirement in most every jurisdiction. Because the footing is directly on soil, it is constantly exposed to wetness and humidity from the ground. In turn, the foundation wall is poured onto the footing. The footing begins to absorb water and, because it is always exposed to moisture, keeps absorbing water. Capillary wicking causes the water to rise up through the footing. It continues to rise through the foundation wall that has been poured directly on top of the footing.
Fully insulated basements are now very common. In Ontario (Canada), it is a building code requirement for new homes. In other jurisdictions, full basement insulation happens when people renovate their homes and want to use the area as living space. However, the most common wall system presents a new challenge in managing the same old moisture dynamics.
Most full height basement insulation wall systems place a vapor permeable moisture barrier (such as 30 lb felt) against the foundation wall, apply the stud wall which they fill with fibrous insulation, then place a vapor barrier to the inside prior to the final finish. This is an excellent wall system for above grade in moderate and cold climates where the vapor drive is, in general, from the inside outward.
In the basement area, the placement of the vapor barrier can create a problem. Without any changes to the system, the capillary wicking mechanism carrying moisture from the ground up into the basement wall is continuous. In a basement that has full height insulation and a vapor barrier to the inside, that moisture can no longer dry to the inside. Instead, it will continue to move upwards and inwards, just as it did before, where now it will be trapped in the cavity behind the vapor barrier and can wet the insulation and moisture-sensitive wood components of the wall. This can lead to mold, rot, and structural decay.

The Solution

There is a very simple solution to this difficult and serious problem in new homes under construction: provide a capillary break between the footing and the wall poured on top of it. This is a basic separation of the foundation wall and the footing that interrupts the flow of moisture between the two. The same concept is already applied to the outside of the foundation wall, where one of the functions of the dampproofing (i.e. dimple sheet) is to act as a capillary break between the wall and the damp soil against it.

DELTA®-FOOTING BARRIER is an elegantly simple solution to the capillary wicking problem. It is very easy to install. Just lay it into the freshly poured concrete footings and form the keyway with the membrane in place.
The specially-designed needle punch fabric forms a strong mechanical bond with the concrete. It resists tearing due to the force from the placement of the drainage gravel. The top polyethylene layer creates a positive barrier and break to prevent the wicking of water from the footings through to the foundation walls.
With a special non-slip surface coating, DELTA®-FOOTING BARRIER helps keep the jobsite a safe place to work.
Rebar may be inserted into the wet concrete through an X-cut in the DELTA®-FOOTING BARRIER. Forms for the foundation walls are placed and the concrete is poured normally.
DELTA®-FOOTING BARRIER acts as a physical barrier preventing the movement of moisture from the footings into the foundation wall where it can lead to mold growth, deterioration of the structure and an unhealthy basement living environment.
When used in combination with other DELTA® brand products, DELTA®-FOOTING BARRIER is an important part of the DELTA® Premium Moisture Protection System.

References

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