

Research Report



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Preventing Moisture Problems in Below Grade Walls

- Precautions can be taken to prevent ground water and rain water runoff from penetrating basement and foundations:
 - > Slope soil adjacent to building for a 6-inch drop in the first 10 feet
 - > Provide an 8-inch or greater gap between the soil and exterior finish material
 - > Use landscaping with low watering requirements near building
 - > Provide gutters and downspouts
 - > Provide a combined length of 2 to 6 feet of extenders and splash blocks on downspouts
 - > Waterproof below grade walls
 - > Install foundation drains
- The continuous layer of EPS insulation and concrete in the Reward iForm™ is water resistant

Below grade moisture and water problems can be prevented by following well-established guidelines. These guidelines are for all buildings, not just buildings with Reward iForm walls. The EPS insulation on the exterior face of the Reward iForms is water resistant and provides additional protection from saturated soil compared to traditional concrete walls. However, waterproofing and other measures are required to ensure dry walls, crawl spaces, and basements.

Soil and Backfill. The first ten feet of soil adjacent to a building should act as a continuation of the roof and allow water to drain away from the building. Many building codes require a 6-inch vertical drop in the first 10 feet away from the building. This allows rainwater and snowmelt to drain away from the building and minimizes soil saturation near the building.

Gap between exterior finish and soil. Most codes require a minimum of 8 inches between the top of the soil and the start of the exterior finish material. This gap helps prevent moisture from the ground from wetting or damaging brick, vinyl siding, or other exterior finishes. The EPS insulation exposed to the outdoors by this gap needs to be protected from sunlight (ultraviolet damage). Protective coverings are available for this purpose.

Landscaping near walls. The use of sprinklers or hoses near exterior walls adds to the potential for moisture problems. Landscaping materials that require little or no watering near the foundation wall help prevent moisture from entering the walls.

Gutter and downspouts. Properly designed gutters and downspouts drain water away from a building. For foundation walls, provide downspout extenders and/or splash blocks that release water at least 2 feet and preferably 3 feet from the building. For basement walls, this distance is at least 3 feet and preferably 6 feet.¹

Waterproofing membrane or sealant. All basement and foundation walls below

¹ *Moisture Control in Buildings*, ASTM Manual Series MNL 18, Heinz Trechsel, editor, ASTM, West Conshohocken, PA, 1994, p. 361. www.astm.org



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grade, including the Reward iForm, require a waterproofing sealant or membrane. These can be one of two types:

- Contact membrane
- Air gap or drainage membrane system

Follow manufacturer's instructions for application and use. Systems that provide backfill protection work especially well. Do not use a petroleum based product or one that contains solvents, ketones, or esters. These products are not compatible with the EPS and will deteriorate the foam.

The waterproofing membrane applied to the exterior foundation wall should be extended down the side of the footing for a few inches.

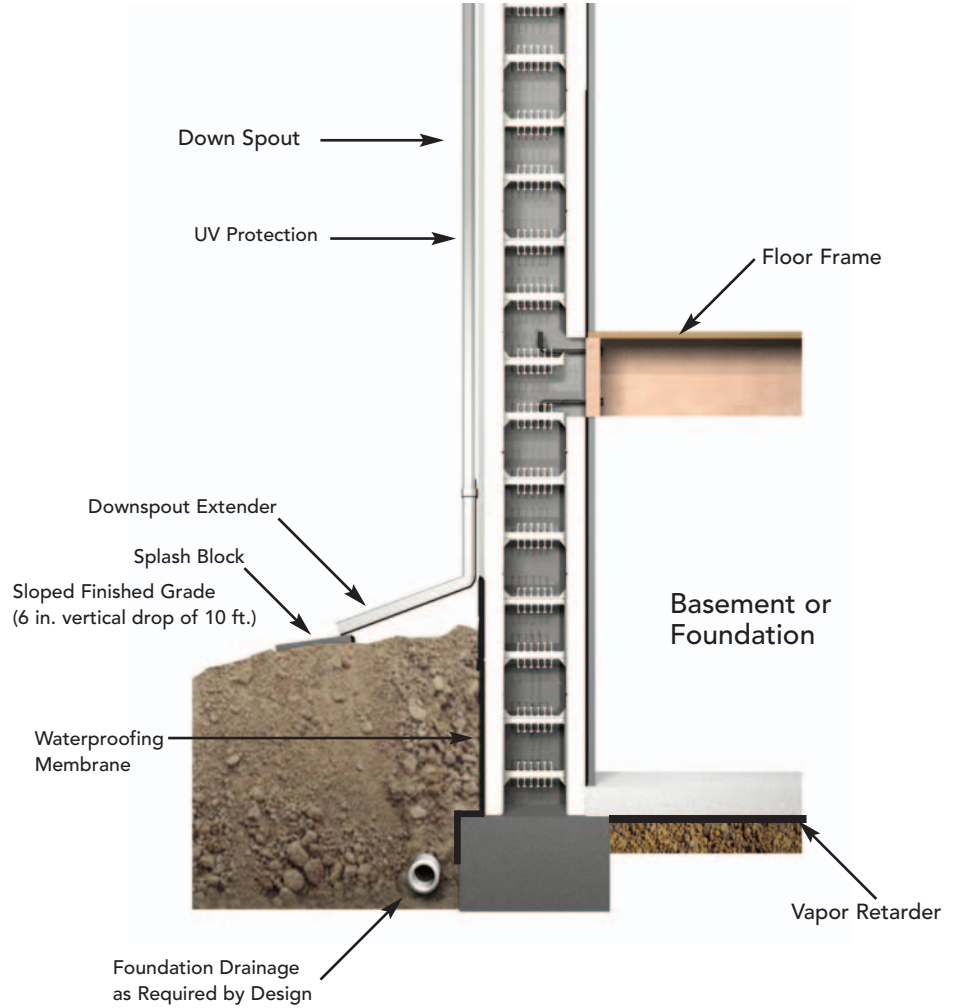
Where foundations are below the water table, apply an appropriate waterproofing system to the full top of the foundation footing before the Reward iForm wall is built on top of the footing. The footing can become wet and this moisture can move up into the wall by capillary action (wicking). The waterproofing on the top of the footing will act as a capillary break and help prevent this rise of moisture.

Water vapor retarder. Vapor retarders should be installed beneath all concrete floor slabs in direct contact with the concrete to prevent moisture from moving up into the building. The vapor retarder should be installed above a granular subbase layer and directly beneath the concrete slab.

Foundation drains. A drain should be located at the base of the foundation to collect water and transport it away from basement and foundation walls. A drain beneath the concrete floor slab is also helpful. To ensure proper drainage away from the building, place aggregate above and below the drainage system and backfill with a free draining material.



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Due to manufacturing processes, EPS thickness, EPS type and the uniqueness of the Reward iForm, this analysis, information and report is only to be used with Reward iForm and is not to be used with any other ICF system



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