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Tech Hotline

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Moisture Control Principles for Design and Construction of Wall Assemblies

Moisture control is one of the basic requirements of a properly designed and constructed wall assembly. Without moisture control, problems such as degradation of moisture sensitive construction materials, mold growth, and poor indoor air quality can result. Listed below are basic principles that must be employed in design and construction of wall assemblies to control moisture.

Rain Water Penetration Control

- □ Develop and construct details that prevent rain water entry into walls.
- □ Protect against rain water penetration from potential leak sources such as windows and doors at their source with flashings that divert water to the exterior. Do not drain leaky construction components into the wall. Terminate flashings in daylight so water is deposited beyond the cladding.
- □ Minimize moisture load on walls from wind driven rain by designing with wide eaves, trim, recesses, drip edges, and other features that keep water off of walls.
- □ Protect non-vertical surfaces with flashing, coping, and/or waterproof materials.
- □ Recognize that complex roof lines funnel water to critical junctions in construction. Construct roof line details to accommodate increased water flow.
- □ Seal the perimeter of all penetrations through the wall with quality sealant materials. Inspect and maintain sealant through the life of the structure.
- □ Protect water-sensitive sheathing materials with Sto Guard fluid applied air/moisture barrier to prevent degradation from precipitation during construction and incidental moisture intrusion after construction.
- □ Whenever possible test complex details where multiple materials come together to verify performance and understand sequencing of work.

Condensation Control

- □ Provide a continuous air barrier *system* of interconnected air barrier *materials* around the building envelope to control air leakage and minimize the risk of condensation.
- □ Install vapor barriers in cold climates on the warm-in-winter side of the wall.
- □ Do not install interior vapor retarders in hot humid climates (to protect against warm moist air condensing behind the vapor retarder).
- □ Insulate metal frame construction on the exterior to avoid thermal bridging effects.
- □ Adjust rigid exterior insulation type and/or thickness in cold climates to move the dew point to the rigid insulation.
- □ Do a water vapor transmission analysis to determine whether or not there is any problem with condensation in the assembly and make appropriate adjustments to minimize condensation.
- □ Provide special analysis for buildings with very high or very low interior relative humidity conditions for all climates.
- □ Vent or remove excess humidity caused by the use of temporary heaters during construction. Vent or remove excess humidity during occupancy.

Mechanical Controls

- □ Pressurize interior space in hot humid climates with conditioned (dehumidified) air so that warm humid outside air is not drawn to the interior.
- □ De-pressurize the building slightly in cold climates to prevent exfiltration of warm/humid air into cold walls.
- □ Maintain interior relative humidity at all times within ASHRAE recommended guidelines to control microbial growth, to minimize condensation potential, and to provide occupant comfort. Follow ASHRAE recommendations when designing an air tight building envelope.

Last but not least, pay attention to construction details. For a list of critical details see Sto Tech Hotline No. 0403-BSc.