MOISTURE RISK MITIGATION OF THE BUILDING ENVELOPE
Problem Prevention

A significant amount of construction related legal claims in the United States could be attributed to uncontrolled water leakage and moisture penetration. The following items are recommended methods to mitigate risk associated with moisture intrusion:

1. Provide drawing details and construction field solutions that conform with recognized standards as listed in the “References” section at the end of this guideline.
2. Include transition details between different building components that use items such as soldered sheet metal end dams, insulation supports, and sealant pockets to provide complete three dimensional moisture management. Pay special attention to details that are not part of a particular building component’s jurisdiction.
3. Draw details in isometric or three dimensional computer models whenever possible and include each phase of installation to clearly show step-by-step assembly features of complex details.
4. Wind forces can dislodge perimeter roof edge blocking and force water vertically up a wall. Factory Mutual Global recommendations could be consulted and reflected in the details.
5. Thermal short circuits can cause interior condensation problems. Thermal short circuits caused by lack of insulation or failure to provide redundant air and moisture barriers, should be eliminated by initial design and through quality assurance reviews by assigned quality assurance individuals.
6. Provide a dew point calculation for each typical building enclosure assembly to prevent unwanted condensation. Review the continuity of vapor barriers to prevent condensation.
7. Review material types and locations to eliminate adverse moisture exposure, e.g., brick in contact with steel studs, vapor impermeable wall coverings, materials exposed to ice melt salts, capillary action through stone, etc.
8. Identify and define the individual(s) responsible for quality assurance of all moisture intrusion details. Pay special attention to all penetration details and details located at intersections of different building components (e.g., window-to-precast; metal wall panel-to-brick veneer cavity wall; air infiltration barrier to curtainwall, etc.).
9. Identify and define the individual(s) responsible for quality assurance of field installation of moisture intrusion components of the project.
10. Mock Ups:
   a. Consider using laboratory mock ups for new or complex systems. Lab mock ups allow many different tests to be performed, permit rebuilding a mock up into different
configurations to define different performance results, and allow standard details for installation to be defined.

b. Use field mock ups to review aesthetics, real world construction techniques and results, and multiple detail configurations expressed in a single mock up installation.

11. Tests & Inspections
   a. Identify and schedule specific inspections for critical moisture intrusion features, including
      i. Drainage plan inspection before cladding is applied,
      ii. Through-wall flashing mock ups and spot inspections,
      iii. Integration details between different building components prior to being covered,
      iv. Moisture content of floor and roof substrates before applying finishes, etc.
   b. Provide field tests to detect moisture intrusion in mock up details and installed conditions.
   c. Provide moisture content test for concrete or lightweight insulating concrete prior to applying finishes.

REFERENCES:

Industry Standards:
- Adhesive & Sealant Council (ASC)
- American Architectural Manufacturers Association (AAMA)
- American Society of Heating, Refrigeration & Air-Conditioning Engineers (ASHRAE)
- American Society for Testing and Materials (ASTM)
- Brick Industry Association (BIA)
- Carpet & Rug Institute (CRI)
- Ceramic Tile Institute of America (CTIOA); see CTIOA Field Report 2001-6-01
- Exterior Insulation Manufacturers' Association (EIMA)
- Factory Mutual Global (FMG) (register for free downloads at www.fmglobal.com)
- National Concrete Masonry Association (NCMA)
- National Glass Association (NGA)
- National Roofing Contractors Association (NRCA)
- Portland Cement Association (PCA)
- Precast Concrete Institute (PCI)
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- Single Ply Roofing Institute (SPRI)

Proprietary Standards:
- Architectural Graphic Standards, Wiley & Sons
- Gypsum Construction Handbook, U.S. Gypsum Corporation
Regulatory Standards:

- ASCE 7-05, American Society of Civil Engineers (ASCE)
- International Code Council Suite of Model Building Codes

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