

# To The Point Builders' Risk Water Damage Prevention

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Water damage is one of the most frequent loss types in the construction industry. Such losses can be costly and become a major setback to any project.

Sources of water damage vary widely and can originate both internally and externally. Sources include inclement weather, deficient design, faulty workmanship, and active wet systems on site. Exposure to water damage typically increases with the number of water sources on site. Occupancies with a large number of wet systems and fixtures, such as residential or hospitality projects, represent an increased potential for leaks.

A formal and comprehensive water damage prevention plan can help a project prepare for, and mitigate against, losses stemming from water damage. Below is a list of items to consider when creating a site specific plan.

## External Sources

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### Planning

- Review contract documents and alert architect and owner to any perceived design issues or product specifications that may result in water intrusion.
- Consider utilizing a building envelope consultant to review design documents - particularly on geometrically complex buildings or projects with numerous exterior systems.
- Consult with the various building envelope product manufacturers to confirm adequacy of design details and compatibility between overlapping products.
- Hold preconstruction meetings with all relevant subcontractors, manufacturers, and design team members to verify means and methods, design intent, and sequencing.

Risk Engineering Services

- On renovation projects, carefully survey the existing building conditions before construction begins. Look for discoloring on finished surfaces and other signs of preexisting water intrusion issues.
- Assemble an exterior mock-up to replicate site conditions, difficult transitions, and system overlaps.

### **Construction**

- Slope surrounding grades away from foundations, basements, and low level openings.
- Carefully backfill below grade walls as soon as possible after waterproofing installation and inspection.
- Seal intermediate floors to provide a “temporary roof” before the building is topped-out and enclosed. Construct water dams at edge of floor details, floor penetrations, shaft openings, and stair wells.
- Install all roof drains as early as possible. Make certain that drains are properly braced for large volume storms and maintained throughout construction.
- Inspect all flashing and caulking details for proper lapping and application.
- Thoroughly document all roofing and waterproofing system tests. Testing should meet both design and manufacturer specifications.
- After rain and snow events, inspect temporary drainage, roof drains, flat roofs, pits, building openings, and other areas where water may breach or accumulate.
- If needed, install temporary protection at building openings - including:
  - Door and window openings
  - Balconies and decks
  - Incomplete roofing and waterproofing installations
  - Ventilation and piping openings
  - Roof penetrations

- Routinely inspect vapor and weather barriers. Repair all tears, openings, or punctures as soon as possible.
- Utilize mold resistant wall board at central stair shafts, electrical rooms, and other areas that require installation prior to floors being enclosed.
- Whenever possible, schedule interior finish work and delivery of porous materials to start after completion of the building envelope. For projects where this is not an option - create a detailed weather plan and provide adequate protection for finish materials.
- Plastic sheets or tarps used to temporarily protect porous materials can trap moisture and humidity. Be sure to allow materials to fully dry before covering and secure protection in a manner that allows air circulation.

### **Internal Sources**

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#### **Planning**

- Promote a peer review of the mechanical system designs to examine the adequacy of isolation valves, piping specifications, and other items pertaining to leak control.
- Insure building system designs include sufficient leak and flow detection, monitoring, and alarming.
- Review temporary and permanent protection of critical systems (i.e. fire control panels, electrical panels, equipment, etc.).

### **Construction**

- Coordinate wet system testing with QC/QA program to verify water tightness of systems post- install and prior to activation.
- Establish protocols for all system testing. Subcontractors should notify site management prior to charging wet systems, provide leak watch, and thoroughly document system tests.
- Have management personnel witness wet system testing to verify adequacy and recognize potential issues.
- Confirm that if framing materials become wet that they are dry and moisture content is within acceptable levels prior to enclosing or covering with sheathing materials or building finishes.
- Develop an emergency water response plan. Plan should account for monitoring of wet systems and course of action in the event of a leak.
- Post site plans that highlight the location of isolation valves and system pumps. Tag rooms, valves, and pumps with instructions for shut down and emergency contact information. Note to confirm there is not a fire prior to valving-off or shutting down the fire protection system.
- Equip project will fully stocked “spill kits” to quickly respond to leaks on site. Kits can include portable pumps, hoses, mops, and other key items that might limit damage on site.
- Install flow detectors on fire and domestic water pumps for monitoring purposes. Monitoring should be able to detect large flows during non-working hours and notify site management. If a working telecom system is not yet available, monitoring can be done through a temporary cellular network.

### **General**

- Pre-qualify potential subcontractors to ensure adequate experience in the specified work.
  - Pre-plan and coordinate with a 24-hour emergency restoration company to respond to incidents.
  - Pre-arrange the availability of drying equipment on site - including dehumidifiers, fans, and wet- dry vacuums.
  - Establish report procedures so that any water damage, leaks, or water intrusion incidents are promptly conveyed to management staff.
  - Inspect materials upon delivery so that wet materials are not accepted or installed.
  - Minimize on site storage of finish materials as much as possible. When required, materials should be elevated off the ground and away from moisture sources.
  - Install materials in dry conditions - per manufacturer's specifications.
  - Thoroughly document critical installations.
- All moisture-generating equipment should be vented outdoors.
  - Provide adequate ventilation and monitor moisture levels during curing of water based materials (eg: gypcrete, floor levelers) installed inside buildings that interface with other porous materials (eg: gypsum wallboard, wood, insulation, etc.).
  - Properly ventilate attics, crawl spaces, or other tightly enclosed areas.
  - At the end of each work day, ensure all windows and doors have been closed and that water sources have been turned off.

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