Insight: Water Intrusion Assessment and Checklist for Construction Projects

Recognizing the Risk

Water intrusion into buildings under construction can occur via multiple events including weather related rain, snow, and ice through an open roof top or building envelope, surface flash flooding, piping rupture due to overpressure, water hammering from pumps or freezing, valve failure during testing of domestic and fire water sprinkler systems, appliance overflow or failure and many other sources. The property damages and disruption created from these events or failures can be significant, depending upon the use of the structure, the existence of an early notification system, the extent of pre-planned mitigation plans and the effectiveness of staff on premises familiar with critical water control valve locations and mitigation and restoration best practices.

This checklist is designed to address expected sources of water intrusion that can be inspected in advance, as well as procedures to mitigate risk of damage and disruption during a water intrusion event, and recommended procedures.

Pre-Event Actions to Implement

Pre-Event Survey – Internal Piping Systems

- ☐ Survey structure and identify potential internal and external entry sources of water intrusion (monthly)
- ☐ Key areas prone to water leakage should be included in the security tour including water close rooms, penthouse, mechanical rooms, hallways on floors with finished rooms and suites and floors comprising active water systems.
- ☐ Security tours should utilize electronic tracking systems and reviewed and extended monthly if needed
- ☐ Create diagram or map of all domestic and fire protection systems showing zonal, floor and main water control (shutoff) valves
- ☐ Diagram should include hatched areas associated with identified water control valves – display what area is supplied by which valve
- ☐ Assure each water control valve is equipped with securely-affixed label with identifying code/number and indicating area controlled
- ☐ For piping entering any basement or ground floor levels from below grade, assure that any shut-off valves have been temporary identified outside of the structure to help visitors, fire department, security, and craftsman located these values.
- ☐ Assure all water control valves, stand pipes, and risers are in good and operable condition, open and close freely and that any tamper or monitoring equipment is functioning
- ☐ Assure a master list of areas supplied and water control valves exists and is readily accessible by property management personnel, project manager team, craftsman, security guards, and structure superintendent.
- ☐ Assure that the master list includes matching control valve, risers, and stand pipes identification and indicates those valves equipped with tamper monitoring devices as well as zone or area label and description for each valve
- ☐ A master list should be created for each liquid source system (domestic, fire protection, process water, etc.)
- ☐ Survey all floor or other internal drain openings to assure each is free and clear of obstructions, refuse, dirt, etc. (monthly)
- ☐ Inspect the condition and tightness of any floor curbs for elevator shafts, stairwell entrances, and any seals provided at floor openings to lower floors (monthly)

- ☐ Inspect and where possible, test drains to assure each terminate freely to a repository on the external of the structure or to internal drain piping that is secured and free/open of blockage (monthly)
- ☐ Inspect, clean, and test, where possible, any sewer backup preventers or devices to assure they are in good working order and operable (quarterly)
- ☐ Assure that all rooms or temporary exterior enclosures, penthouse, hoist elevator suites, etc. housing water piping networks, fittings, tanks and control valves are provided with heat from reliable systems that can maintain a minimum temperature of 50°F (10° C) (weekly during cold season)
- ☐ Identify a General Contractor or Mechanical Subcontractor Superintendent responsible for developing, identifying, and have full responsibilities for managing the water intrusion identification process and mitigation plan.
- ☐ Permanent drainage should be installed early in the construction project with a functional discharge system for the building or sewer system.

Pre-Event Survey – External Building Envelope

- ☐ Survey potential external entry points of water intrusion due to inclement weather including windows, doors, vents, envelopes, elevator shafts, stairwells, and other penetrations points, etc. (weekly)
- ☐ Inspect to assure weather-stripping, seals, temporary roofs within the structure, curbing around elevator shafts and temporary penetration points into the stairwells are in good condition and not crimped, torn or damaged (monthly)
- ☐ Assure that all openable windows, bucket hoist elevator landing doors, and doors close tightly, and self-closing door appurtenances are functioning correctly (monthly)
- ☐ Assure that exterior entries to basement and lower level areas are provided with drainage or curbing to keep surface water out of the building (monthly)
- ☐ Where safe and accessible, have trained, identified, and assigned craftsman on the water mitigation team should inspect roof drains, scuppers, gutters and downspouts on a regular basis to assure they are in good condition and not obstructed with debris, laves, limbs, etc. (monthly)
- ☐ Where safe and accessible, have trained, identified, and assigned craftsman on the water mitigation team should inspect roof systems to assure no missing shingles, damaged or loose ridge vents, missing or damaged water and ice shields, water ponding, other physical damage exists to roofing systems (monthly)
- ☐ Where safe and accessible, have trained, identified, and assigned craftsman on the water mitigation team should inspect exterior cladding of structure including siding, clapboard, EIFS, etc. to assure no visible damage, missing or unsecured components (monthly)
- ☐ Where safe and accessible, have trained, identified, and assigned craftsman on the water mitigation team inspect to assure there are no unprotected openings into the wall system(s), unsealed openings around penetrations such as vents, electrical conduit, HVAC wall units, etc. (monthly)

Pre-Planning – Liquid Damage Prevention Plan (LDPP)

- ☐ Develop a written Liquid Damage Prevention Plan (LDPP) for the structure which identifies high risk areas of potential damage as identified in the facility surveys.
- ☐ Configure the LDPP to address and respond to both clean water incidents and contaminate water incidents. Where other liquid exposures exist, they should be addressed in a specific section of the LDPP
- ☐ The LDPP should include or reference a diagram of all domestic and fire protection systems showing location of zonal, floor and main water control (shutoff) valves and tanks
- ☐ The LDPP should contain a log of reportable water intrusion events to assist in identifying leaking or intrusion trends and should comprise date, location, source of intrusion, extent of damage, duration of response and restoration activities, etc.

- ☐ The LDPP should identify responsibilities for personnel designated to respond to a water intrusion event, including off peak times and on the weekends.
- ☐ The LDPP should include clear instructions and procedures on response protocol and identify location of LDPP reference diagram and valve closure instructions
- ☐ The LDPP should have identified responsibilities for personnel designate in cleaning up the water intrusion event, including off peak times and on the weekends.
- ☐ Provide training on the existence and use of the LDPP to all building maintenance and engineering personnel as well as supervisors and managers (quarterly)
- ☐ Inspect to assure that the facility contains a Water Intrusion Response kit on premises containing electrical extension cords, ground-fault circuit interrupters (CFCI) with multiple taps, plastic buckets (5 gallon), wet/dry vacuum, rubber boots, hoses equipped with required adaptors, squeegees, pipe wrenches and fire sprinkler shut-off devices (quarterly)
- ☐ Acquire and stage spill and leak cleanup supplies at critical locations within the structure to enable rapid response and mitigation
- ☐ Install and mount posters at building elevators and inside elevators and on floors comprising active domestic and fire sprinkler water systems which detail emergency contact name and number to call in event of liquid leaks to raise awareness to the trades and who to call
- ☐ Develop contractual relationships with water and liquid damage remediation, heating and restoration vendors and include key contact information within the LDPP. If appropriate, provide differing contacts for differing types of leaks, spills or water damages, recovery and restoration
- ☐ Assure that heat is maintained at all times during frigid and freezing weather within rooms and areas comprising liquid piping, tanks, valves, etc. that are negatively exposed to freezing conditions (seasonal)
- ☐ Inspect and validate required spill and leak mitigation supplies and replenish as required (quarterly)
- ☐ Update the LDPP piping and control valve diagram when new liquid piping systems and components are added to the structure. Review and revise the LDPP accordingly (quarterly)
- ☐ Consider the installation of an approved, water intrusion detection system at critical source areas of water entry or release with monitoring at a constantly attended location such as a security office or main control room
- ☐ Update the LDPP on a regular basis or as required to comprise system and piping changes, personnel changes and assigned responsibilities (quarterly)
- ☐ Conduct re-inspections of the facility components at the frequency indicated above (monthly)
- ☐ All plumbers who are allowed to work should have required local/national certification and be part of the recognized plumbing associations.
- ☐ All materials utilized for the project must meet or exceed the specification approved by the engineer on record for the project.
- ☐ A QA/QC department of the project should be able to certify the incoming plumbing materials, evaluate the plumber's certifications, and Master Plumber should inspect, verify and certify their work against the approved quality standards.
- ☐ All hydrostatic testing of piping and fixtures, functioning of pumps, sprinkler systems leak tests, tanks filling operations, major valves operations, cooling tower commissioning and other HVAC systems should be attended in person and nothing should be left over for overnight or weekend unattended. If any test requires long duration and it cannot be attended in person, the test should be discontinued and item under test to be secured and made safe prior to leaving the site.
- ☐ An advance contract agreement should be in place for the term of construction with remedial companies that are involved in the drying and post water damage recovery operations to avoid delays in remedial actions.

- ☐ A written process should be established and a person responsible for the temporary water management should be assigned prior to introducing the temporary water into the building. Flexible rubber hoses should be utilized to a bare minimum. Safe route and with adequate cutoff valves should be part of the temporary water management.
- ☐ Fully functional sump pumps of adequate capacity should be available for those projects having below grade construction. Any high lead items susceptible to water should not be stored in below grade areas.

Actions to Implement When a Water Intrusion Occurs:

Response – Liquid Damage Prevention Plan (LDPP)

- ☐ Activate the LDPP and provide immediate notification to all appropriate parties (including property management team, construction superintendent team, response team and security personnel as listed in the Plan based upon the type and location of the event
- ☐ Appropriate response members should assemble at the site of the intrusion to evaluate the extent of the leakage or intrusion and activate the LDPP
- ☐ Designated response members should move to staging areas identified in the LDPP to initiate viable mitigation procedures including liquid shutoff of zonal, floor or area control valves
- ☐ Immediate notification to other Team members as outlined in the LDPP should occur to implement protective mitigation actions of vulnerable materials, stock, goods, equipment or other assets. Include the removal of exposed items or application of protective coverings, spill control, water damming set-up, temporary drain measures, etc.
- ☐ Notification to external authorities should be initiated where assistance will be required (local utility service shutoffs), where personnel safety is at jeopardy or where nearby facilities may be exposed
- ☐ Depending upon the magnitude of the event and where warranted and required within the LDPP, notification of pre-arranged restoration and recovery mitigation firms should be commenced. This is following
- ☐ Activate the LDPP to investigate potential leaks in piping, fittings and valves where the interior of the structure experiences freezing conditions

Restoration and Recovery – Liquid Damage Prevention Plan (LDPP)

- ☐ Assure that the LDPP includes a section that addresses restoration responsibilities and procedures to follow once the water intrusion event has ended or is mitigated
- ☐ Assure that any approved recovery and restoration vendors are listed in the LDPP with their appropriate contact information (e.g., e-mail addresses, phone numbers)
- ☐ Activate the restoration and recovery component of the LDPP as soon as the event has ended or been mitigated. Contact approved vendors to support cleanup and restoration activities.
- ☐ Assure adequate spill, cleanup supplies and necessary equipment are stored in a pre-positioned protected place and on site. This might include spill control material, water vacuums, fans, tarps, plastic sheeting, utility tape, and other materials used to support restoration, cleaning and recovery.
- ☐ Assure that a member of the LDPP Team is assigned and equipped to take photographs or video of the areas damaged and evidence of mitigation and restoration to support insurance claim submission

References & Resources

AIG Insight: Water Intrusion

AIG Insight: Cold Weather Precautions

AIG Insight: Flood Tip Sheet

AIG Insight: Flood & Water Damage COM-CG-11-0044

For more information, contact your local AIG Risk Engineer.

The information, suggestions and recommendations contained herein are for general informational purposes only. This information has been compiled from sources believed to be reliable. Risk Consulting Services do not address every possible loss potential, law, rule, regulation, practice or procedure. No warranty, guarantee, or representation, either expressed or implied, is made as to the correctness or sufficiency of any such service. Reliance upon, or compliance with, any recommendation in no way guarantees any result, including without limitation the fulfillment of your obligations under your insurance policy or as may otherwise be required by any laws, rules or regulations. No responsibility is assumed for the discovery and/or elimination of any hazards that could cause accidents, injury or damage. The information contained herein should not be construed as financial, accounting, tax or legal advice and does not create an attorney-client relationship.

This document is not intended to replace any recommendations from your equipment manufacturers. If you are unsure about any particular testing or maintenance procedure, please contact the manufacturer or your equipment service representative.

American International Group, Inc. (AIG) is a leading global insurance organization. AIG member companies provide a wide range of property casualty insurance, life insurance, retirement solutions and other financial services to customers in approximately 70 countries and jurisdictions. These diverse offerings include products and services that help businesses and individuals protect their assets, manage risks and provide for retirement security. AIG common stock is listed on the New York Stock Exchange.

Additional information about AIG can be found at www.aig.com | YouTube: www.youtube.com/aig | Twitter: @AIGinsurance www.twitter.com/AIGinsurance | LinkedIn: www.linkedin.com/company/aig. These references with additional information about AIG have been provided as a convenience, and the information contained on such websites is not incorporated by reference herein.

AIG is the marketing name for the worldwide property-casualty, life and retirement and general insurance operations of American International Group, Inc. For additional information, please visit our website at www.aig.com. All products and services are written or provided by subsidiaries or affiliates of American International Group, Inc. Products or services may not be available in all countries and jurisdictions, and coverage is subject to underwriting requirements and actual policy language. Non-insurance products and services may be provided by independent third parties. Certain property-casualty coverages may be provided by a surplus lines insurer. Surplus lines insurers do not generally participate in state guaranty funds, and insureds are therefore not protected by such funds.

Copyright © American International Group, Inc. All rights reserved.