

**WATER INTRUSION AND FLOOD CONTROL
MAINTENANCE PLAN**

[Insert District Name]

Date: _____

Location: _____

Water Intrusion Plan

Overview

In order to have an effective water intrusion plan, a school or district should ensure that the information that follows is understood and communicated throughout the organization. This plan is a minimum guideline for water intrusion and must be customized for each location. Responsible staff should be trained, competent and have proper levels of authority to act quickly in the event of a leak, spill or flood regardless of size.

Plan Management

Plan implementation is imperative to effectively control moisture and prevent water intrusion and subsequent mold growth within buildings. Components of a comprehensive water intrusion plan include:

- Specifying responsibilities for management, maintenance and facilities workers and the general employee population.
- Understanding and documenting locations of equipment and/or sources that may contaminate the building due to leak or flooding such as locations and routes of piping for bathrooms, locker rooms, chillers, water heaters, boilers, water supply lines, fire system supply and HVAC units and the like.
- Integrating preventative practices to identify issues before they create more catastrophic damage occurs. This includes routine building and equipment inspections, roof inspection, ensuring drains, gutters and the like remain clear of blockage and strictly adhered to preventative maintenance procedures on mechanical, HVAC and plumbing equipment.
- Seasonal plans to prevent damaged piping and/or equipment due to freezing temperatures.
- Availability of materials to prevent damage due to extreme weather causing floods or water entry into the building.
- Ensuring proper equipment is available for prompt remediation on small incidents and securing vendors that can react to more catastrophic or emergent needs.
- Procedures to evaluate suspect mold which should include environmental monitoring and contingency plans for alternative facilities, classrooms or administrative activities.
- Accident/incident reporting procedures, documentation and record keeping logs/maintenance.
- Comprehensive training practices that anticipate seasonal variations, communicate best practices and reinforce procedures and responsibilities.

Responsibilities

Maintenance & Operations Director

The M&O Director is responsible for general oversight of plan policies and procedures, and periodic revisions as new guidelines or best practices evolve. The M&O Director has authority to allocate resources where needed, and approve necessary corrective actions. The M&O Director also provides factual and timely responses to school site work orders. Prompt and thorough responses to questions concerns regarding cause, cleanup, and completion of a moisture or mold intrusion incident will encourage confidence in management's handling of the situation and minimize speculation by residents.

Maintenance & Operations Director: _____

Phone: (_____) _____ - _____ Email: _____

Maintenance Supervisor

The Maintenance Supervisor is responsible for administering the general maintenance procedures outlined in the plan. The Maintenance Supervisor shall also coordinate response and elimination of moisture problems, water-damaged building materials, and mold remediation. These duties may include contracting with outside specialists; supervising on-site employees conducting cleanup work; and overseeing contractor's remediation work.

Maintenance Supervisor: _____

Phone: (_____) _____ - _____ Email: _____

Onsite Maintenance Staff

Onsite maintenance staff is responsible for immediate investigation and reporting of any water intrusion or moisture collection incident, water damage, or mold growth discovered during routine building inspections or reported by residents. The maintenance staff must notify the Maintenance Supervisor of all water occurrences.

Training

The Plan should be reviewed with all maintenance staff at least twice annually. These reviews should include a discussion of any new information; communication and prevention procedures; inspection requirements; small area cleanup guidelines; and personal protective equipment required for small remediation projects conducted by onsite personnel. New hires will receive training on plan procedures during their initial safety and training orientation.

Documentation and Record Keeping

Maintaining accurate and well-organized records is the responsibility of the M&O Director, who must document all water intrusion events, response activities, and follow-up. Sample templates are attached in the appendix and should be modified to suit individual occurrences. All original records shall be retained for at least eleven years (or as required by law) at the site and at the district office in accordance with local laws and regulations. Records should be filed by building number. **These records may be requested by Keenan & Associates in the event a claim is filed.**

Building Inspections

Regularly scheduled building inspections can help identify water intrusion problems before mold has a chance to establish itself.

[INSERT PROPERTY NAME] currently conducts the following inspections:

- *Monthly Building Inspections* – Performed by Maintenance Supervisor or competent maintenance staff with written results submitted to the M&O Director.
- *Bi-Annual Utility Closet Inspections* – Performed by maintenance staff with written results submitted to the M&O Director.
- *Scheduled HVAC Filter Inspections/Change Outs*: Performed by staff per manufacturer's recommended maintenance schedule. Results are documented in maintenance log.
- *Scheduled HVAC Equipment Maintenance*: All equipment is inspected and serviced per manufacturer's recommended schedule and are documented on the HVAC Checklist.
- *Daily observations of the properties* by Management Staff, Maintenance Supervisor, and maintenance staff.

Investigating Suspected Moisture and Mold Problems

If water intrusion, water damage is suspected or reported, the Maintenance Supervisor or designated maintenance staff member must investigate the situation as soon as possible. **Response to water intrusion events MUST occur immediately upon discovery to avoid further damage. District Emergency Notification Contacts. (Appendix A)**

Reporting Incidents

If the incident or condition is reported by a school site, the Maintenance Supervisor shall complete a Work Order Request form and assign responsibility for investigation and evaluation of the situation to a maintenance staff member within 8 hours of the report. Ideally, the incident should be investigated within 12 hours of the report, but not more than 24 hours after.

Safety Procedures While Investigating Moisture and Mold Problems

- Employees must not touch mold or moldy items with their bare hands. Wear latex gloves and use a screwdriver or other tool to probe or scrape contaminated areas. After the investigation, wash hands thoroughly before touching eyes or face.
- Do not get mold or mold spores in eyes.
- Do not breathe in mold or mold spores.
- Use Personal Protective Equipment when disturbing mold. The minimum PPE is an N-95 respirator, latex glove, and safety glasses.
- Ensure moisture investigation training is incorporated into regular scheduled safety meetings for maintenance and facilities personnel.

Investigation Follow Up

When the investigation is completed, the M&O Director shall determine what course of action is necessary and, if needed, complete a Work Order Request form for immediate start of repair or remediation efforts. This must be done in addition to any Incident Report submitted by the Maintenance Supervisor. Service requests and Mold and Moisture Incident Reports shall be assigned a number, logged in the tracking file, and filed by school site for later reference.

Response to a Water Intrusion

Staff responding to a water intrusion event should initially identify the source of water and, if possible, shut off the source or repair the damage that is allowing the intrusion. If the situation is beyond the employee's ability to control, the employee must immediately contact a supervisor or the Maintenance Supervisor to report the problem and request assistance. The Maintenance Supervisor or M&O Director will determine if a pre-qualified outside contractor is required and contact the contractor immediately. If the Maintenance Supervisor or M&O Director are not available, use the District Emergency Notification Contacts list to notify and request assistance. **(Appendix A)**

Pre-qualified remediation/drying restoration contractors shall be identified **(Appendix A)** for response to water damage situations prior to water intrusions.

Remediation of Water Intrusion

Mold growth can be minimized by expedient, appropriate water damage cleanups. Response to a water intrusion event should occur immediately upon discovery, with substantial action completed within 24 to 48 hours after discovery to mechanically pickup up to 95% of accumulated water to minimize the potential for mold growth.

Appendix A
(Emergency Notification and Inspection Checklists)

District Emergency Loss Notification Contacts:

This table must be updated on a regular basis (at minimal quarterly) to ensure correct contact information.

Last Update:

<u>School Sites:</u>	Notes:
School Site:	
Contact Person:	
Phone No.:	
Email:	
School Site:	
Contact Person:	
Phone No.:	
Email:	
School Site:	
Contact Person:	
Phone No.:	
Email:	
School Site:	
Contact Person:	
Phone No.:	
Email:	
<u>Insert others as needed</u>	

SELF-ASSESSMENT FOR MITIGATION AND PREVENTION OF LIQUID DAMAGE

Instructions:

1. Complete for each building or other major complex.
2. Prepare a written plan that details what to do in the event of a leak or liquid damage. Assign overall responsibility to a person in authority to oversee the process.
3. Review this plan at least once a year. Several items should be checked quarterly, such as the list of responders and the inventory check of materials and equipment needed for leak response and clean-up.

Item	Yes	No	Actions/Comments	
1	Is there a written plan detailing what to do in the event of a leak and liquid damage?	<input type="checkbox"/>	<input type="checkbox"/>	
2	Is the plan reviewed for changes and discussed at staff meetings at least quarterly?	<input type="checkbox"/>	<input type="checkbox"/>	
3	Has the "Checklist for valuable equipment areas" been completed for all areas containing critical electronic and operational equipment, main telephone rooms, computer centers etc.?	<input type="checkbox"/>	<input type="checkbox"/>	
4	Is the "Checklist for valuable equipment areas" reviewed during the planning or design stage for new construction, renovation or relocation projects?	<input type="checkbox"/>	<input type="checkbox"/>	
5	Is someone immediately available at all times (24 hours, 7 days) with authorization to call and bring in the professional cleanup and restoration companies? (Please refer to the Property Loss Notification Contacts List)	<input type="checkbox"/>	<input type="checkbox"/>	
6	Are the names and phone numbers for professional cleanup and restoration companies readily available? (Please refer to the Property Loss Notification Contacts List)	<input type="checkbox"/>	<input type="checkbox"/>	
7	Is someone available on all shifts trained to respond immediately to any leak?	<input type="checkbox"/>	<input type="checkbox"/>	
8	Is this list of responders reviewed at least quarterly to check for turnover? (Please refer to the Property Loss Notification Contacts List)	<input type="checkbox"/>	<input type="checkbox"/>	
9	Are all those responding to a leak aware of the location of valves?	<input type="checkbox"/>	<input type="checkbox"/>	
10	Does the staff have immediate access to a spill response cart/supplies and emergency pipe repair supplies?	<input type="checkbox"/>	<input type="checkbox"/>	
11	Is the supply of spill response and pipe repair materials complete, readily accessible and checked at least quarterly?	<input type="checkbox"/>	<input type="checkbox"/>	
12	Are pipe diagrams or prints up-to-date and showing the location of valves for all liquid-carrying systems? Isometric drawings are very beneficial. (Note 1) (Appendix B)	<input type="checkbox"/>	<input type="checkbox"/>	

	Item	Yes	No	Actions/Comments
13	Are valves placarded or tagged for easy identification?	<input type="checkbox"/>	<input type="checkbox"/>	
14	Are shutoff valves “exercised” (closed, reopened and lubricated as needed) at least annually to verify they can be quickly closed during an emergency?	<input type="checkbox"/>	<input type="checkbox"/>	
15	Are small leaks promptly repaired? A small leak may be a sign of hidden corrosion or other problem with potential for growing into a catastrophic leak.	<input type="checkbox"/>	<input type="checkbox"/>	
16	Is the cause of any leak analyzed to determine if it was an isolated occurrence or a symptom of a system-wide problem?	<input type="checkbox"/>	<input type="checkbox"/>	
17	Are housekeeping personnel instructed to immediately notify maintenance when any types of dripping, leakage or clogged drains are found?	<input type="checkbox"/>	<input type="checkbox"/>	
18	Is there a lockout/tagout procedure in place when valves are shut on liquid-carrying systems under repair or modification?	<input type="checkbox"/>	<input type="checkbox"/>	
19	Is there close monitoring of third-party work that may affect piping systems (sprinklers, water, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	
20	Are there any liquid storage tanks or vessels (hot water, condensate, boilers, fuel oil, etc.) inside the building, mechanical penthouse or on the roof?	<input type="checkbox"/>	<input type="checkbox"/>	
21	If so, is there a dike around the tank or vessel and/or drains to contain or effectively carry away leaking fluids? Dikes are required around fuel tanks.	<input type="checkbox"/>	<input type="checkbox"/>	
22	Are there leak detection sensors at low points and inside diked areas? If so, have these been tested regularly?	<input type="checkbox"/>	<input type="checkbox"/>	
23	Are there any floor openings or cracks through which a leaking fluid may pass through and damage areas below? (Note 2)	<input type="checkbox"/>	<input type="checkbox"/>	
24	For basement areas, are there any water mains, sprinkler mains or liquid utility piping entering through the walls or floor?	<input type="checkbox"/>	<input type="checkbox"/>	
25	Is there any evidence of leakage or seepage through the wall or floor openings? If so, indicate repair schedule.	<input type="checkbox"/>	<input type="checkbox"/>	
26	Is an underground plan of these mains immediately available showing the location of shutoff valves? (in case an underground leak occurs and water flows through the wall or floor opening) (Note 3)	<input type="checkbox"/>	<input type="checkbox"/>	

Item		Yes	No	Actions/Comments
27	If any part of the property is exposed to potential flood, is there a formal flood emergency plan or similar flood preparation plan?	<input type="checkbox"/>	<input type="checkbox"/>	
28	If your office is in an earthquake- prone area, has your automatic sprinkler system been surveyed by a professional to determine extent of vulnerability for leakage? (Note 4)	<input type="checkbox"/>	<input type="checkbox"/>	
29	Are roofs inspected regularly (minimum of every 6 months, or after severe storms) to check for damage or deterioration such as cracking, splitting, blistering, separation, holes or other potential sources of leakage?	<input type="checkbox"/>	<input type="checkbox"/>	
30	Are there any roof leaks or evidence of ponding on the roof? If so, indicate reasons and the repair schedule.	<input type="checkbox"/>	<input type="checkbox"/>	
31	Are roof-mounted cooling towers inspected regularly, and are cooling tower basins “watertight”? (Note 2)	<input type="checkbox"/>	<input type="checkbox"/>	
32	Are there any areas directly adjacent to the building where rainwater can accumulate during heavy rains? Large landscaping planters built next to grade wall and windows are an example where water can pond and find its way into the building.	<input type="checkbox"/>	<input type="checkbox"/>	

Notes:

1. Liquid-carrying systems may include: sprinkler systems, hot and cold water piping, chilled water lines for cooling, hot water lines for heating, condensate piping, sewer lines, drain lines, fuel oil piping, etc.
2. Floor openings often occur around penetrations made for pipe and conduit. Seal the open space around the pipe or conduit to prevent passage of liquid. Often, these are penetrations in concrete floors that are required to be fire stopped anyway. Use a fire stop that produces a tight liquid seal as well. A fire stop is a UL-listed fire-resistive material used to fill holes in fire-rated floors and walls. Some types resemble caulk.
3. Accurate drawings of the underground water mains are important in a large complex with private mains. A leak may occur in an underground pipe near a building. There may be a control valve in the basement or just outside the building. Closing this valve may not stop the leak if the break is upstream of the valve and the water is flowing along the outside of the pipe then into the building. A plan showing the location of all valves in the system will be needed to quickly locate another valve to shut and stop the leak.
4. Sprinkler pipes and heads often break during earthquakes when they are hit by swaying fixtures or ceiling tile systems. Breaks or leaks also occur if the sprinkler pipes are not adequately braced per the latest code. In these situations, breaks or leaks occur from excessive pipe swaying or when pipe movement is not in sync with the building’s movement.

Post Event Water Intrusion Checklist

The following actions will help staff begin the cleanup process when water intrusion occurs. Restoration contractors have the equipment necessary to quickly remove large volumes of water and to clean and treat buildings and furnishings. They have the experience and resources to effectively clean and repair electronic equipment and to recertify it if necessary.

Action Taken	Check
Building	
Remove wet items such as carpeting, padding and ceiling tile, anything that holds moisture to an exterior location or cutoff dock area.	
Use all available and rentable vacuum equipment to eliminate water on floors as soon as possible. Also use squeegees and mops.	
Use fans to help circulate the air and assist drying.	
Open drawers and closet doors to enhance drying.	
Blot hard surface furniture dry. Place non-staining blocks or aluminum foil under furniture legs.	
Lift draperies off carpet and suspend.	
Move photos, paintings and art objects to a safe, dry location.	
Use air conditioning if water damage occurs during a warm season.	
Equipment	
Turn off power immediately! Do not energize wet equipment!	
Do not reenergize equipment until authorized by qualified restoration personnel or manufacturer's technical representative.	
Open cabinet doors/side panels/covers/drawers - drain all water.	
Remove equipment to a cool, dry area after wiping down and eliminate as much moisture and contaminants as possible.	
Set up fans to move ambient air through equipment.	
Blow water out with clean compressed air (or preferably liquid nitrogen) and/or other drying equipment.	
Spray water displacement solvent on electronic components (such as contact cleaner, LPS 1 or alcohol/Freon mixture).	
Wipe down and dry metal surfaces as soon as possible - use protective surface treatments to slow corrosion (CRC, LPS 1).	
Follow up with professional restoration services	

Spill Response Cart and Pipe Repair Supplies

A spill kit and emergency plumbing repair supplies should be available for quick accessibility and use anywhere in the building. The following list contains suggestions for a spill response kit. The maintenance department should participate in selecting the contents and locations of the kits. Make plastic sheets to cover electronic equipment readily available in the applicable areas for use by operators.

Items to Include (Please also refer to Food Checklist)	Check
Spill Response Cart and Pipe Repair Supplies	
Plastic sheets to throw over and protect equipment (should be immediately available in every valuable equipment area)	
Plastic bags to dispose of wet material	
Wet vacuums or other water removal equipment (commercial grade with effective GFIs, squeegees, mops, buckets)	
Portable pump(s) and hose	
Water displacing solvents for applying to electrical equipment (examples: contact cleaner, LPS 1 greaseless lubricant)	
Preservatives for metal (examples: CRC, LPS 1)	
Towels for wiping up (assumed to be available from housekeeping)	
Absorbent socks, to contain and absorb spills	
Alcohol for computer equipment (ISA99 for purity)	
Pipe clamps to place around and stop a leak (pipe repair kit)	
Diagrams of piping systems with valve locations highlighted	
Dehumidifiers (or ready rental source)	
Boots	
Portable dikes for diverting surface water away from below grade doorways and possible points of water entry. This would be necessary during unusually heavy rains, and especially if the hospital has a history of water accumulating near certain doorways, loading docks, parking ramps, etc.	

Appendix B
(Property Specific Mechanical Diagrams)
(Water Mains and Cutoff)
[Insert Site Diagrams Here]