

# RiskTopics

Water damage response plans and response carts

Zurich Resilience Solutions - Risk Engineering

Damages caused by water infiltration, pipe system leaks, equipment failures and other liquid spills are unfortunately all too common in the construction industry. Being prepared to quickly respond to and contain a leak or water intrusion event can significantly limit the extent of damages and reduce overall disruptions to the project. A formal water damage response plan and well-stocked water damage response cart are important tools to consider as part of a project's overall water damage and mold prevention plan.

## Introduction

Water infiltration, piping leaks and liquid spills are unfortunate but frequent occurrences on many construction projects and can cause significant property damage and schedule delays. How a project responds to such incidents can help limit the extent of such damages and associated delays. Water response carts strategically placed throughout a project during construction and commissioning of wet utility systems are an important tool to help improve response times and contain damages to a smaller area.

## Discussion

Historic Zurich claims data shows that water damage from both internal and external sources has always been a leading cause of loss for builder's risk policyholders. There are several different sources for water damage during the course of construction, including flooding, elevated water tables, rain and wind-driven rain, snowmelt, piping systems, HVAC equipment, tanks, pumping systems, incomplete building envelopes, etc. A Water Damage Prevention Plan should identify all potential sources that may impact the project and provide mitigating actions to effectively control each risk. However, should your project experience a water damage incident, response planning also becomes an important feature of any comprehensive plan.

Although a Water Damage Response Team and Water Damage Response Cart will not prevent these incidents, rapid response to such incidents can have a substantial impact on the magnitude of the claim by reducing the overall spread of damage through a building and reducing project delays associated with cleanup, drying out, testing, equipment replacement, and reconstruction of affected areas.

Extensive damages can occur when water is allowed to travel downwards through several floors of a building, damaging electrical equipment, ceilings and other concealed spaces. In this scenario, damages may go undetected for an extended period of time, resulting in corrosion, mold, odors, or premature equipment failures. Water damage to electrical, control, processing, or laboratory equipment in particular can cause extended delays for equipment testing, repairs, or replacement, especially if the manufacturer's warranty provisions cannot be assured and transferred to the owner without factory refurbishment or full replacement.

## Guidance

One of the initial steps in responding to a water release or water infiltration incident is to get the necessary cleanup materials and tools to the area of concern. For projects under construction, valuable time can be lost locating these materials and tools and in cases where the project is nearing completion, the necessary tools and materials may no longer be on site or readily accessible. Strategic placement of well-stocked water damage response carts in the building can reduce response time and limit the extent of damages, particularly if the water can be contained from spreading to lower levels. Water response carts and associated materials may be needed in several convenient locations for large buildings or multi-building projects.



Figure 1: Water damage response tools staged in a convenient location (Source: Zurich Risk Engineering)

### Water Damage Response Planning

The first step in responding to a water intrusion or water leak incident is to make sure the project has identified and trained a Water Damage Response Team. Some key aspects to consider when assembling and designating such a team for your project include:

- Include a variety of people from the project team, including Project Managers, Superintendents, Loss Control Personnel, Field Engineers, etc. These persons should be very familiar with the project, the layout of the site and buildings, access logistics, and the location of wet utilities, shut off valves, and water response carts or supplies.
- It is advisable to also include members from primary subcontractors and trades on the project, particularly those that will be involved with the project for a long duration, such as the Mechanical, Electrical, Plumbing, Fire Protection, Drywall and Interior contractors. These trades are typically well distributed throughout the building on any given day and can be effective in reporting and responding to a water damage incident.
- All Water Damage Response Team personnel should have proper access to water supply shut-off valves. This might include access / keys for normally locked utility and equipment rooms and access to specialty tools for shut-off valves, such as long-handled keys for valves located in vaults or manholes.
- Along the same lines as above, it may be necessary to shut off electrical services. Ensure that response team members have access to locked electrical equipment rooms and breaker boxes. Instruct responders to enter rooms only if it is absolutely safe to do so.
- As soon as water services are turned on in any part of the building, the status and location of wet systems should be reviewed in the weekly or daily subcontractor and safety meetings. This will help keep individual trades advised when systems are filled, tested or commissioned and allows them to plan their work accordingly. Daily job hazard analyses can identify tasks with the potential for water damage and can be used to further outline proper controls and response actions in the event of a water release.
- Shut-off valves should be clearly labeled to identify the service and zone / equipment controlled. Emergency contact numbers should be listed at main control valve locations. Consider posting shut off valve locations / plans in key areas of the project.

- If the project is using after-hours monitoring, such as security guards or fire watches, these personnel should also be informed about the status of live water systems within the building, shut-off valve locations, water damage response cart locations, and emergency contacts. Patrols should include areas of higher risk, such as riser rooms, HVAC rooms, pump rooms, temporary weather protection and temporary water services.
- When temporary protection is required, such as temporary roof drains, temporary weather protection or temporary water services, members of the response team should inspect all temporary installations on a regular basis, as well as before and after all significant weather events. Formally documenting these inspections helps to ensure corrective measures are completed when necessary.
- Where possible, temporary services should be turned off and drained at the source nightly by a member of the Water Damage Response Team. Temporary services should be provided outside of the building or structure when possible and should only incorporate robust and durable materials.
- Where wet systems cannot be isolated and drained, freeze prevention measures and heating systems should be verified through building inspections or the use of remotely monitored and alarmed temperature sensors that can send alerts to the appropriate response personnel.
- Prior to commissioning wet utility systems, it may be advisable to chain and lock or otherwise secure supply valves or riser rooms to prevent accidental or malicious operation of the valves, which can introduce water to incomplete or 'open' piping systems.

### Water Damage Response Cart – The Basics

Below is a list of suggested items to include in a water response cart; however, it is not intended to be all-inclusive. The project should consider other items as appropriate for the work conditions. Larger items may need to be located in a central project job box or container. A sample checklist provided in Appendix A provides a more succinct list of the items described below.

- Prepackaged spills kits are available for purchase from several suppliers; however, these are often simple kits more suitable for small leaks that develop after a project is complete. Creating a custom water intrusion response cart ensures that the proper tools and materials are included specific to the project's needs.
- Consider using a large rolling cart or trash bin to place the items in, something that can be easily wheeled into an elevator for moving between floors or positioned under a leaking pipe to catch water while shut-off valves are located. Tilt carts will also facilitate easier emptying of water and debris.
- Assemble a simple tool kit for removal of access panels, tightening fittings, cutting sheeting or tarps, etc. For multi-story projects, several floors of the building may be substantially complete, and basic tools and equipment may be located several floors away. Having an assortment of hand tools in the cart can save valuable time responding to a leak. Sample items include water pump pliers, adjustable wrenches, screwdrivers, hammer, pry bars and retractable knives.
- Wet/Dry vacuum to contain smaller spills, with hoses to drain the vacuum to a sink, floor drain, or to the building exterior. Exercise caution when discharging to the exterior to avoid allowing water to simply re-enter the building through unsealed / unprotected basement openings.
- Brooms, squeegees, mop and mop bucket
- Plastic sheets or tarps to cover critical equipment, especially electrical gear or data equipment
- Portable sump pump and discharge hoses
- Extension cords and GFCI protected "whips" for connecting equipment to house power
- Heavy duty trash bags – wet materials are often very heavy; therefore, heavy duty bags are recommended



Figure 2: Rolling cart with supplies (Source: Zurich Risk Engineering)

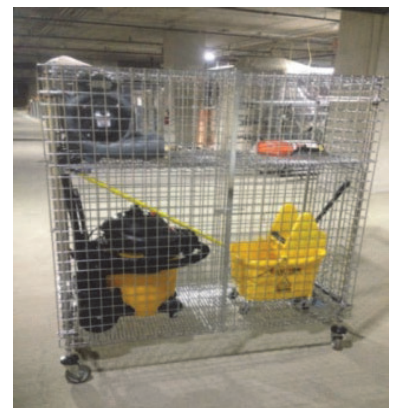


Figure 3: Alternate storage option (Source: Zurich Risk Engineering)

- Absorbent materials or absorbent socks to create dams at doorways, stairwells, chases, and floor openings
- Duct Tape, zip-ties, rope or tie-wire to secure tarps, plastic sheeting, etc.
- Emergency pipe repair kits and pipe clamps for common pipe diameters
- Wet floor signs
- Rubber or nitrile gloves
- Face shield or safety glasses – for eye/face protection if it is necessary to approach a water leak to shut off the flow, such as approaching an activated sprinkler head or tighten a loose fitting. Use only when it is not reasonable to isolate the flow from a control valve first.
- Water displacing solvents for critical electrical equipment / contact cleaners / greaseless lubricants to help reduce potential for corrosion
- Sprinkler head shut off devices (e.g., Shutgun®, or similar) or wood wedges that can immediately stop flow of water from a damaged sprinkler head (after it has been determined no fire emergency exists). Some commercially available devices allow the sprinkler head to resume discharge if a fire develops or re-develops under the sprinkler head.
- Although not necessarily needed in the cart, ensure the project has quick access to a portable generator and fuel in the event the leak causes or requires a power outage. List the equipment contact person and location on the checklist.
- Valve Maps – piping plans or laminated placards showing main control valve locations for each wet system, as well as a list of emergency response contact persons and numbers
- Wrapping the cart with clear plastic can help discourage workers and employees from ‘borrowing’ items out of the cart and not returning them.
- A copy of the checklist with included items should also be posted on the water response cart.

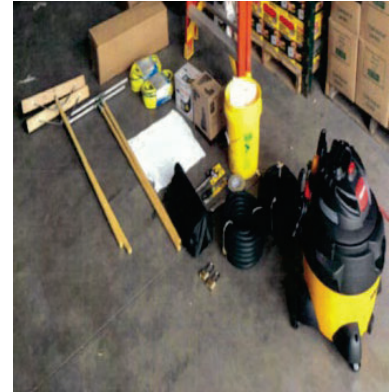


Figure 4: Sample response cart supplies (Source: Zurich Risk Engineering)

### Water damage response cart checklist:

Water response carts require a small capital investment compared to the potential for reduced damages. The carts also become a tool that can be maintained for use on future projects or transferred to the Facilities Manager at project completion. For high-rise buildings, it may be prudent to place carts on several floors.

See Appendix A for a sample Water Response Cart checklist. The list is not all-inclusive, and the project should consider other items appropriate for the actual work conditions and risks specific to the project.

### Water Damage Response Planning – Additional Considerations

If your project has a particularly high or unique risk of water intrusion, system leaks, or has a very limited tolerance for any type of project delay (such as a sports facility or hotel with a fixed, firm opening date), consider these additional tips for the project’s Water Damage Response Plan:

- Be prepared to promptly report potential losses to relevant insurance companies, take photographs or videos of damage and potentially damaged areas, and secure and save any failed components that may have contributed to the incident.
- Prearrange agreements with a local rental or restoration company for supply of dehumidifiers, fans, blowers, pumps, etc.
- Prearrange agreements with a water extraction or restoration company that can ensure a guaranteed response time with professional equipment. Backup arrangements may also be advisable if the area is subject to frequent storms.



Figure 5: Example where a response cart could have prevented water from entering an escalator machinery pit (Source: Zurich Risk Engineering)

- Consider incorporating guaranteed response times to any agreements and establish after-hour or emergency call lists for these companies.
- Arrange access to large generators and fuel for powering pumps, wet/dry vacuums, dehumidifiers, blowers, etc. if there is an elevated risk of losing power to the area of concern.
- Employ an after-hours / weekend security monitor who can provide surveillance for a variety of risks including theft, vandalism, trespassing, fire, loss of power to critical systems (e.g., temporary heaters, dewatering pumps), water intrusion from storms and of course, water release incidents.
- Install remote monitoring systems with cellular reporting capabilities, such as systems that monitor for unauthorized access/intrusion, smoke/fire, temperatures, humidity levels, water sensors, unusual changes in water flow for mechanical systems, etc.

## Conclusion

A trained, well-prepared water damage response team and ready-to-use water response carts distributed throughout the high-risk areas of a building under construction can significantly reduce the response time and subsequent damages should a water infiltration event or piping system failure occur on your project. Limiting the amount of water released from a pressurized system and containing that water to a single unit or floor before it can travel down pipe chases, electrical raceways, elevator, and equipment shafts, etc. can help reduce the overall disruption and delays to a project. Such incidents often occur at a point in the project when any lost time for cleanup, repairs and equipment replacement can be critical to achieving final completion.

Once a contractor or owner has assembled several water response carts, they can be easily moved throughout the building to cover the higher risk areas. They can also be turned over to the building owner at substantial completion for continuous protection, or they can be maintained and stored for use at future projects.

A Water Damage Response Plan is just one portion of a comprehensive Water Damage Prevention plan. Additional resources to assist with water damage mitigation are outlined below.

## Other related Zurich RiskTopics

Zurich has a suite of Risk Topics related to the control of water services and the prevention of water damage for facilities during and after construction. Please ask your Zurich Risk Engineering representative for a copy of these additional Risk Topics:

- Water infiltration and mold prevention strategies for contractors
- Water damage response cart sample checklist
- Wet work permit program
- Wet work permit
- Water damage prevention daily jobsite inspection
- Guide to hurricane emergency action plans for construction
- Hurricane emergency action plan (HEAP) checklist for construction
- Flood emergency response plans
- Reducing Infiltration in Modular Construction
- CPVC Sprinkler Pipe Failures



Figure 6: Sample of Zurich's Wet Work Permit – available upon request

## Other resources

[Natural Hazards Resource Hub](#)

[ZRS Marketplace](#)

[ACURE Water Damage Program](#)

## Appendices

### Appendix A

Below is a list of suggested items to include in a Water Response Cart; however, it is not intended to be all inclusive. The project may consider other items appropriate for the work conditions or may locate larger items in a central project job box.

Water Response Cart owner:

Cart Location:  Last Inspected:

Emergency Contact & Number:

Emergency Contact & Number:

#### Contents: (check if included)

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- Large rolling cart or Trash bin – use to store cart items, contain leaks or debris. Size to allow transport on elevators. Wrap cart with plastic film to prevent theft/borrowing of contents
- Small hand tool kit - for removal of panels, tightening fittings, cutting tarps or carpet
- Wet/Dry vacuum - to contain smaller spills, with hoses for draining tank to a sink or exterior
- Plastic sheets or tarps - to cover critical equipment, especially electrical or data equipment
- Portable sump pump and discharge hose
- Extension cords and GFCI protected “whips” - for connecting equipment to house power
- Squeegees
- Broom
- Mop and mop bucket
- Heavy-Duty trash bags and towels
- Absorbent materials or boom to create dams at doorways, stairwells and open chases
- Duct Tape, zip-ties, straps or tie wire
- Emergency pipe repair kits and clamps for common pipe sizes
- ‘Wet floor’ warning signs
- Face shield or safety goggles
- Rubber or nitrile gloves
- Emergency response contact list - including the primary contact or subcontractor responsible for each wet utility system
- Valve location maps – floor plans / piping diagrams showing control valve locations
- Sprinkler head shut off devices - to stop flow of water from damaged sprinkler head, after it has been determined no fire emergency exists
- Water displacing solvents for critical electrical equipment / contact cleaner / greaseless lubricant
- Access to portable generators and fuel - (not needed in the cart, but available on demand in case leak causes or requires a power outage. List location and contact person here)
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