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Resilience Solutions

RiskTopics

Wet work permit program

Zurich Resilience Solutions - Risk Engineering

Based on historic Zurich claims data, one of the leading causes of property damage during construction is attributed to weather events, including water damage caused by weather. Water damage from non-weather events, such as plumbing, piping and mechanical system failures also accounts for a large portion of Zurich's builder's risk claims. While it can be difficult to control damages caused by Mother Nature, damages caused by liquid piping systems can often be prevented through implementation of detailed procedures and controls.

Introduction

Water damage losses caused by work involving water piping, pumping, drainage or mechanical building systems can be prevented or minimized by developing and implementing an effective water damage prevention plan that can include among other things a wet work inspection, monitoring and permit program. Zurich has developed a wet work permit program, similar to a hot work permit, which is outlined in this Risk Topic and should be used in conjunction with Zurich's wet work permit.

Discussion

The guidance and procedures outlined in this document can apply to any construction, renovation or maintenance related wet work activity, defined as any work involving water or non-flammable liquid carrying piping and mechanical systems where escape of such liquids can cause damage to any portion of the project, structure, building or materials. This can include wet taps, new construction, pipe network extensions, installation or maintenance on wet systems such as fire sprinkler, domestic water, chilled water and hot water systems, sump pump systems, storm water and drainage networks, water infiltration from exterior works and filling or pressure testing operations. These procedures should be implemented for wet work performed by both employees and outside contractors.

Guidance

Wet Work Permit Program

A wet work permit should be completed by any employee, third party service provider, or contractor performing work on filled or live water carrying systems, piping or equipment (i.e., wet works). The permit program is applicable to new construction projects, building renovations, building or system additions and maintenance activities requiring a breach of liquid carrying pipes, devices, appliances or mechanical equipment. The permit should only be issued by the Supervisor once the precautions outlined in this Risk Topic are implemented and that implementation is verified.


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CAUTION!

WET WORK IN PROGRESS

In case of a water leak

Water Watch Instructions

Periodic Work Area Inspections (completed by supervisor during wet work and post wet work period)

Final work area inspection (completed by subcontractor at conclusion of work)

Permit close out (completed by GCCM)

Management should supervise the wet work permit process and authorize only designated supervisory personnel with the appropriate training and project knowledge to issue permits. Before issuing a permit, management should require completion of a pre-work evaluation and a work site inspection to ensure all risks associated with the work have been considered.

Zurich's wet work permits can help provide a simple and consistent means to identify the appropriate parties responsible for the work (including a water watch), authorize specific work activities and locations, verify that the pre-work evaluation and proper controls are in place, track periodic and post-work inspections and document the permit close out process. The permits are provided with carbon-copy forms and high-visibility hang tags for convenient administration and display at the work area. If the work involves impairments to an operational fire protection system, additional system impairment protocols and notifications are important. Zurich's wet work permit can be used in conjunction with a fire protection impairment notification process, but it is not suitable substitution. Zurich also offers solutions for a formal fire protection system impairment program.

Pre-work evaluation

The person conducting the pre-work evaluation should ask the following questions before issuing a wet work permit. The proposed wet work may need to be delayed or canceled depending on the answers to these questions.

1. Can this work be avoided? Is there a better process to get the job done?
2. Are all wet systems protected from freezing?
3. Are the domestic, fire protection, chilled and hot water systems monitored/alarmed with flow meters? If not, are roaming patrols implemented to check the systems during off hours and are patrols documented?
4. If high-value or long-lead-time equipment (e.g., electrical gear, medical equipment) is installed before piping systems are tested and monitored, is adequate protection in place?
5. Are the primary firewater control valves secured (chained and locked) in the appropriate position (open or closed) to prevent unauthorized, accidental or malicious operation of the valves? Are main control valves tagged to indicate who is authorized to operate? In the event of a leak, can the valves quickly be unlocked or operated by authorized personnel?
6. Are written response procedures and water spill containment kits available in the event of a water system failure before, during and after testing? Is there a water containment kit located at designated locations? Are there enough kits for the project?
7. Are water supply shutoffs for each floor or zone identified and labeled on a plan, posted in central locations, communicated to workers on site and reviewed at each jobsite meeting?
8. Are sump, storm water or sanitary pumps needed for any part of the project? Are they monitored/alarmed or otherwise routinely inspected to confirm operability? Are backup pumps and redundant or backup power supplies readily available?
9. If the wet work is occurring in an occupied building, has the work been coordinated with the building owner or facilities manager to ensure systems they need remain online and the building sprinkler system remains online? If the system needs to go offline, does the work need to be scheduled outside of regular working hours? Is a fire watch required? Has the impairment or outage been reported to the monitoring agency?

10. Is a lockout/tag-out permit also required for the system or equipment affected by this work?

Work Site Inspection

The person conducting the wet work jobsite inspection should ask the following questions and verify the correction of unsatisfactory conditions before issuing a wet work permit.

1. Is approved equipment provided for the wet work? Is the equipment well maintained and in good working condition? Are pressure-testing devices and rigs suitable for the testing conditions (pressure, flow rates, temperature, etc.)?
2. Does installer have a copy of the written plan detailing what to do in the event of a leak or accidental water discharge?
3. Does installer know the location of the shutoff valves and are they accessible?
4. Are the valves placarded or tagged for easy identification?
5. Are pipe diagrams easily accessible at the location of work being performed?
6. Has the piping been drained prior to the start of any wet work?
7. Is a spill response cart available at the work area?
8. Have floor openings or cracks through which a leaking fluid may pass, and damage areas below been protected?
9. Is electrical and other sensitive equipment protected from potential water damage?
10. Are all drains (floor and sink) in the area of the work functional and clean?
11. If work is being performed on the roof, are the temporary or permanent roof drains/scuppers connected, free of debris and functioning properly? Do temporary roof drains, downspouts or storm drains allow water to run back into the building or structure?
12. Has a person been designated as the dedicated water watch?

Commissioning a Sprinkler System

1. Does the building have reliable heat?
    a. If no, consider draining the system after testing to avoid freezing and burst pipes.
    b. If yes, consider leaving water in the sprinkler system with the branch line valves in the closed position until the system is ready for commissioning or as otherwise instructed by the building owner or authority having jurisdiction. This can prevent continuous filling of the system but can also give an early indication if a sprinkler head is damaged during construction.
2. Once flow alarms are available and reliably reporting to a monitoring system, the system should be commissioned and left on. A formal fire protection system impairment protocol should be implemented at this time to manage all future outages.

Permit Issuance

The wet work permit should only be issued if the applicable precautions have been met. After assigning wet work watches as needed, the supervisor should sign and issue the permit to the authorized wet work person. Permits should be posted at the work site and should expire no later than the end of the supervisor's shift. Wet work watchpersons should be trained on the response procedures in place in the event of a leak or accidental water discharge, including a review of all applicable shut-off valve locations.

The supervisor should inspect the work site after work is completed. The supervisor can then sign and date the permit verifying the work has been completed in accordance with the permit with no signs of leaking. The permit should be returned to the authorizer for final permit close out and then filed for documentation. The work area should continue to be periodically inspected prior to leaving for the day. Follow up inspections may also be prudent in critical areas or around critical systems for several days after the work has been completed.

Conclusion

Developing and implementing a written wet work permit program can be an essential component of a comprehensive water damage prevention plan for facility risk management. A program for the control of wet work performed by maintenance staff, outside service providers and contractors should include measures to identify controls, promote inspections and require authorization to work on active systems where water damage losses are possible. Zurich's wet work permit is an excellent tool to help control and authorize such works. Zurich can provide wet work permits in support of the recommended wet work program described above. For more information, or to request a supply of our permits, contact your Zurich Risk Engineering representative.

References

Zurich U.S. construction claims data

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 plans and response carts
- Water damage response cart sample checklist
- 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
- Management Practices: Fire Protection Impairments

Other resources

Visit Zurich's Natural Hazards Resource Hub and ZRS Marketplace for additional resources.

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