RISK BULLETIN

ALLIANZ GLOBAL CORPORATE & SPECIALTY®

WET WORK MANAGEMENT AND PERMITTING DURING CONSTRUCTION

ALLIANZ RISK CONSULTING

INTRODUCTION

Water damage is a major cause of loss during construction and represents a substantial portion of Builder's Risk claims. Just as Hot Work Permits can reduce the likelihood of a fire, the use of Wet Work Permits can help to prevent or minimize water damage, reduce the likelihood of construction delays and help maintain business continuity. This document provides an overview of Wet Working and items to be included in a Wet Work Permit and should be modified or adjusted for your individual project situation and requirements. An example Wet Work Permit can be found at the end of this document.

ADDRESSING WATER DAMAGE ON CONSTRUCTION SITES

Loss prevention experience shows that water damage continues to be one of the most prevalent causes of claims on construction sites. The reasons for these are many and varied but include:

- A lack of awareness and insufficient risk management
- A lack of on-site management and assignment of responsibility
- Poor workmanship and the use of inexperienced or untrained personnel

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- Failure of piping, valves, or vendor supplied completed assemblies
- Increased high rise developments and vulnerable renovations
- A lack of understanding of the multitude of plumbing systems utilized and the lack of adequate training
- Sub-standard pipework testing procedures
- Inadequate mitigation and emergency response plans

The key to addressing the problem is the allocation of sufficient resources to the identification, analysis and avoidance / mitigation of the risks associated with an unplanned water discharge. The management of the water damage risk should take a prominent place in the project's loss prevention planning and a formal plan should be developed to address the two main categories of exposures:

- Those associated with the permanent distribution and drainage systems
- Those associated with the temporary water supply

One of the most reliable methods to use to address water damage exposures is Wet Working. Wet Working can be defined as any work involving water or fluid on a piping system, drainage, pumping and mechanical systems. It includes activities such as installing, modifying, filling, pressure testing, flushing and maintaining plumbing systems. The plumbing systems could include, mechanical equipment including HVAC, Air Handling Units and associated piping, tanks, fire risers, pipework distribution and sprinklers, drainage and rainwater systems, pumped systems, sanitary sewer systems, etc. Wet Work may also include the use of hoses, drainage, temporary water supplies and connections, flushing of outlets, etc.

WET WORK PERMIT IMPLEMENTATION

A Wet Work Permit is typically part of a water damage prevention plan (a holistic plan used to prevent water damage during construction) and is utilized any time work is being performed on systems (such as piping, pumps, hoses, appliances, etc.) carrying liquids. Examples of when a Wet Work permit might be utilized is when hoses are being used to deliver water for use inside a building under renovation, or perhaps, the charging of a piping network. Such instances have the potential to result in a water release, which can occur, for example, if a charged hose was inadvertently left on overnight and ruptured when the site was unoccupied, resulting in a water release over many hours or days and causing extensive damage. Such a situation could easily be prevented through the use of a Wet Work Permit, which would have resulted in the Wet Work Watcher validating that the water was shut off during the final work inspection. It is always advisable to utilize a Wet Work Permit system to strengthen a water damage loss prevention program.

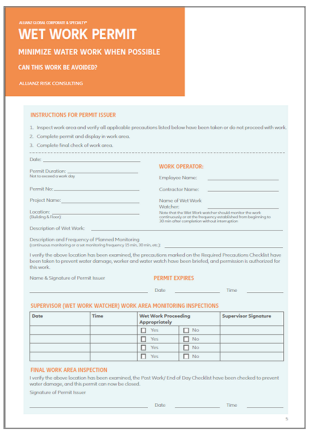
A Wet Work Permit should be used to formally control all work on live plumbing systems, including filling, testing, commissioning, repair work and maintenance and should be used by an authorized employee, qualified construction manager or designated contractor / subcontractor performing any Wet Work. This permit system should include, as a minimum:

- Date and time of permit issue and expiry; duration not to exceed a single working shift
- Exact location and nature of the work to be undertaken
- Confirmation that the area is isolated (if applicable)
- Appropriate mitigation such as wet vacs and bunding/sealing of floor penetrations is in place in the working area
- Where a system is under hydrostatic testing or commissioning, confirmation of permanent supervision
- Confirmation that the flow monitoring and shutoff systems have been reinstated following Wet Work
- Closure of the Wet Work Permit by the permit issuer (appointed person of the Principal Contractor), countersigned by the permitted individual

A Wet Work Permit should be issued for no longer than a single work day and a new permit should be issued for each discrete Wet Work activity.

WET WORK MANAGEMENT & PLANNING

The following paragraphs are intended to explain and clarify the sections in the Wet Work Permit, an example of which is provided as a separate document (feel free to modify as needed).


WET WORK PERMIT

MINIMIZE WATER WORK WHEN POSSIBLE

CAN THIS WORK BE AVOIDED?

ALLIANZ RISK CONSULTING

INSTRUCTIONS FOR PERMIT ISSUER

1. Inspect work area and verify all applicable precautions listed below have been taken or do not proceed with work.
2. Complete permit and display in work area.
3. Complete final check of work area.

Date:

Permit Duration:
Not to exceed a work day

Permit No:

Project Name:

Location:
(Building & Floor)

Description of Wet Work:

Description and Frequency of Planned Monitoring:
(continuous monitoring or at set monitoring frequency (15 min, 30 min, etc.))

I verify the above location has been examined, the precautions marked on the Required Precautions Checklist have been taken to prevent water damage, workers and water watch have been briefed, and permission is authorized for this work.

Name & Signature of Permit Issuer

WORK OPERATOR:

Employers Name:

Contractor Name:

Name of Wet Work Watcher:
(Person in the Wet Work watcher should monitor the work continuously or at the frequency established from beginning to 30 min after completion without interruption

PERMIT EXPIRES

Date: Time:

SUPERVISOR (WET WORK WATCHER) WORK AREA MONITORING INSPECTIONS

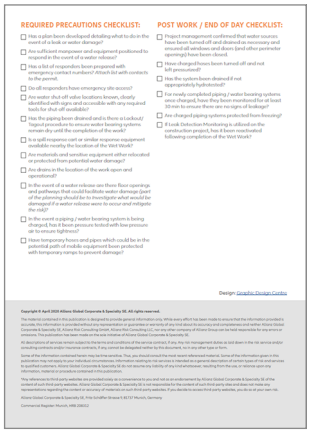
Date	Time	Wet Work Proceeding Appropriately	Supervisor Signature
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	
		☐ Yes ☐ No	

FINAL WORK AREA INSPECTION

I verify the above location has been examined, the 'Post Work/ End of Day Checklist have been checked to prevent water damage, and this permit can now be closed.

Signature of Permit Issuer

Date: Time:


REQUIRED PRECAUTIONS CHECKLIST:

- ☐ Has a plan been developed detailing what to do in the event of a leak or water damage?
- ☐ Are sufficient manpower and equipment positioned to respond in the event of a water release?
- ☐ Has a list of responders been prepared with emergency contact numbers? Attach list with contacts to the permit.
- ☐ Do all responders have emergency site access?
- ☐ Are water shut-off valve locations known, clearly identified with signs and accessible with any required tools for shut-off available?
- ☐ Has the piping been drained and is there a Lockout/Tagout procedure to ensure water bearing systems remain dry until the completion of the work?
- ☐ Is a spill response cart or similar response equipment available nearby the location of the Wet Work?
- ☐ Are materials and sensitive equipment either relocated or protected from potential water damage?
- ☐ Are drains in the location of the work open and operational?
- ☐ In the event of a water release are there floor openings and pathways that could facilitate water damage (wet or dry) to occurring should be to investigate what would be damaged if a water release were to occur and mitigate the risk)?
- ☐ In the event a piping / water bearing system is being charged, has it been pressure tested with low pressure air to ensure tightness?
- ☐ Have temporary hoses and pipes which could be in the potential path of mobile equipment been protected with temporary ramps to prevent damage?

POST WORK / END OF DAY CHECKLIST:

- ☐ Project management confirmed that water sources have been turned off and drained as necessary and ensured all windows and doors (and other perimeter openings) have been closed.
- ☐ Have changed hoses been turned off and not left pressurized?
- ☐ Has the system been drained (if not appropriately hydrotested)?
- ☐ For newly completed piping / water bearing systems since charged, have they been monitored for at least 30 min to ensure there are no signs of leakage?
- ☐ Are charged piping systems protected from freezing?
- ☐ If Leak Detection Monitoring is utilized on the construction project, has it been reactivated following completion of the Wet Work?

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PRE-WET WORK PLANNING

Before Wet Work is undertaken it should be determined if the use of Wet Work is even necessary or can the Wet Work be avoided entirely. If Wet Work is necessary, a plan should be developed detailing what work is to be performed, what risks the work entails and what can be done to mitigate those risks.

The following questions, which are part of the Wet Work Permit, should be considered during the planning stage and prior to the start of Wet Work:

- [ ] Has a plan been developed detailing what to do in the event of a leak or water damage?
  - Points to consider are in the event of a release how will water be shut off, the leak be contained and how damage be minimized.
- [ ] Are sufficient manpower and equipment positioned to respond in the event of a water release?
  - It is important to plan the response in the event of a leak. Manpower and appropriate equipment will be required to reduce damage. Equipment might include pumps, wet vacs, fans, mops, absorbent materials, etc. That equipment should be available near the location of the work.
- [ ] Has a list of responders been prepared with emergency contact numbers? Attach a list with contacts to the permit.
  - Prior to the Wet Work, a list of responders should be prepared which would include the contact names, the positions and the phone numbers. This list should be attached to the permit so it is immediately available in the event of an incident. This list might include the project manager, mechanical supervisor, finishing superintendent, electrical supervisor, etc.
- [ ] Do all responders have emergency site access?
  - All responders need to be granted emergency site access so that they may assist in a timely manner.
- [ ] Are water shut-off valve locations known, clearly identified with signs and accessible with any required tools for shut-off available?
  - It is imperative that prior to the start of Wet Work that all shut-off valves are located and clearly labelled. In the event that special tools (wrenches, curb keys, etc) are required to operate the valves they must be on hand prior to beginning the Wet Work.
- [ ] Has the piping been drained and is there a Lockout/Tagout procedure to ensure water bearing systems remain dry until the completion of the work?
  - A water Lockout/Tagout procedure should be established to ensure that, prior to the completion of the work, piping systems are not accidentally charged resulting in a water release.
- [ ] Is a spill response cart or similar response equipment available nearby the location of the Wet Work?
  - Spill response carts or similar response equipment should be located and available prior to beginning Wet Work. Spill response carts can minimize water damage while the flow of water is controlled and allowing time for additional manpower and equipment to be mobilized.
- [ ] Are materials and sensitive equipment either relocated or protected from potential water damage?
  - Consider relocating and/or protecting materials and sensitive equipment that could be damaged by Wet Work.
- [ ] Are drains in the location of the work open and operational?
  - If drains are in the location of planned Wet Work, ensure that they are not clogged, are connected and verify they are fully operational prior to the start of work.
- [ ] In the event of a water release are there floor openings and pathways that could facilitate water damage *(part of the planning should be to Investigate what would be damaged if a water release were to occur and mitigate the risk)?*
  - A water release can cause damage far from the location of the actual Wet Work. Before Wet Work is undertaken it is important to investigate where the water might go in the event of a release. Floor penetrations, conduits, chases, elevator shafts, etc. are examples of water pathways to consider. In the event that it is discovered that damage potential exists, make sure to mitigate the risk prior to beginning Wet Work.
- [ ] In the event a piping / water bearing system is being charged, has it been pressure tested with low pressure air to ensure tightness?
  - It is typically a good practice to pressure test water bearing systems with low pressure air prior to charging, even if the system previously passed a hydrostatic or other type testing. It is not uncommon that an alteration to a piping system is made by a subcontractor or another trade and after a system has already passed a tightness test and is drained waiting to be entered into service. Many water releases occur due to changes to water bearing systems to facilitate other work. For example, an electrical subcontractor relocating a portion of a potable water line to facilitate electrical conduit installation and then forgetting to restore the water line. Ensuring lines can hold low air pressure for a set period of time is an inexpensive and simple way to ensure water bearing system tightness. Also, charge piping zone-by-zone, never with all valves open. If a failure does occur, it occurs in a smaller section of the piping network which can be addressed more quickly and may result in less damage.

- [ ] Have temporary hoses and pipes which could be in the potential path of mobile equipment been protected with temporary ramps to prevent damage?

- Hoses and pipes which lay in the path of mobile equipment such as scissor lifts, mobile platforms, forklifts, etc. should be protected with temporary ramps as they can be damaged and rupture if driven over.

DURING WET WORK

Ensure that during the Wet Work, the plan which was developed is followed and properly executed. The locations of shut-off valves are identified, equipment to respond in the event of a leak is in place, a list of emergency responders is posted with the permit, drains are open, etc.

It is important that work area monitoring inspections are conducted routinely (to be established in the plan by the Supervisor / Wet Work Watcher). If monitoring is not continuous, it should be frequent enough to prevent a large water release. Sign-offs help to ensure that these critical inspections are conducted in a timely manner.

POST WET WORK/END OF DAY CHECKLIST

Following completion of the work, a Wet Work Watch is recommended for a minimum of 30 min to ensure that a water release does not occur. The following questions should be affirmatively answered prior to the permit issuer signing off on the Final Work Area Inspection.

- [ ] Project management confirmed that water sources have been turned off and drained as necessary and ensured all windows and doors (and other perimeter openings) have been closed.

- The work area should continue to be regularly inspected including after-hours coverage by security personnel as available. Follow up inspections may also be prudent in critical areas or around critical systems for several days after the work has been completed.

- [ ] Have charged hoses been turned off and not left pressurized?

- Hoses left charged with water should be turned off following completion of the work and definitely must be turned off at the end of each work shift / day to prevent a water release.

- [ ] Has the system been drained if not appropriately hydrotested?

- Untested piping systems should not be left charged while unattended.

- [ ] For newly completed piping / water bearing systems once charged, have they been monitored for at least 30 min to ensure there are no signs of leakage?

- Monitoring of a newly charged system should be conducted for a minimum of 30 min, as often a leak will manifest itself within this period of time.

- [ ] Are charged piping systems protected from freezing?

- Once a piping system is charged it must be protected from freezing. Be aware of exterior temperature changes, especially when heating systems are not operational. Make sure all conditioned spaces have closed exterior windows and openings. Consider the possibility of heating system disruption for conditioned spaces under construction.

- [ ] If Leak Detection Monitoring is utilized on the construction project, has it been reactivated following completion of the Wet Work?

- Often prior to the beginning of Wet Work, water flow detection devices associated with leak detection monitoring are disabled. It is important that once Wet Work is completed that the monitoring system is reactivated. One of the most critical times for Leak Detection Monitoring is just following the installation of new piping systems and components.

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WET WORK PERMIT

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3. Complete final check of work area.

Date: _____

Permit Duration: _____
Not to exceed a work day

Permit No: _____

Project Name: _____

Location: _____
(Building & Floor):

WORK OPERATOR:

Employee Name: _____

Contractor Name: _____

Name of Wet Work Watcher: _____
Note that the Wet Work watcher should monitor the work continuously or at the frequency established from beginning to 30 min after completion without interruption

Description of Wet Work: _____

Description and Frequency of Planned Monitoring
(continuous monitoring or a set monitoring frequency 15 min, 30 min, etc.): _____

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Name & Signature of Permit Issuer

PERMIT EXPIRES

_____ Date _____ Time _____

SUPERVISOR (WET WORK WATCHER) WORK AREA MONITORING INSPECTIONS

Date	Time	Wet Work Proceeding Appropriately		Supervisor Signature
		☐ Yes	☐ No	
		☐ Yes	☐ No	
		☐ Yes	☐ No	
		☐ Yes	☐ No	

FINAL WORK AREA INSPECTION

I verify the above location has been examined, the Post Work/ End of Day Checklist have been checked to prevent water damage, and this permit can now be closed.

Signature of Permit Issuer

_____ Date _____ Time _____

REQUIRED PRECAUTIONS CHECKLIST:

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