

Escape of water is one of the most common causes of damage on construction sites. Plumbing leaks related to existing and temporary water supplies used during the construction period, as well as the risk of weather-related water ingress, can all cause significant damage on site; costing money, disruption and inconvenience.

Why escape of water problems happen can usually be pinned down to one-of-five key factors: insufficient risk management; inadequate assignment of responsibility; poor workmanship; sub-standard testing regimes; and inadequate mitigation and emergency response plans.

Create a water management plan

How then can contractors prevent a problem happening? Key to addressing the risk is the allocation of sufficient resources to the identification, analysis and mitigation of risk, and the appointment of someone with overall responsibility in this area.

It's why contractors should consider creating a formal water management plan (WMP) which:

- nominates a clearly identified person responsible for the plan
- includes details of the risk assessment, mitigation and management process
- identifies mitigation measures and emergency response plans
- is regularly reviewed.

The WMP should include detail on the following:

1. Management

A 'responsible person' should be appointed to have overall responsibility for the existence and effectiveness of the water management plan (WMP). This would usually be the main contractor and they might want to delegate to a 'competent person' to help in the management of the risk. This might be a representative from the plumbing contractor, for example.

The overriding aims of this management responsibility include:

- ensuring systems are designed correctly
- ensuring operatives on the ground are competent, and adhering to the WMP
- ensuring systems are installed as per the design
- ensuring that site checks are undertaken
- ensuring that the provisions of the WMP are adhered to by all on site.

In addition, construction work should be phased to reduce risk. This includes the early installation of permanent drainage; early commissioning of bunds, sump pumps and leak suppression systems; shell works to achieve weather-proofing (roofs/windows/other openings) before the substantial start of internal works; and locating temporary water supplies in such a way that any damage caused by system failure will be minimised as far as is practicable.

2. Design considerations

The final design of the plumbing installation should be informed by the risk assessment (part of the WMP) to include:

- loss history
- nature and age of existing installation
- nature of property (number of floors, location of storage tank etc)
- competence and experience of contractors
- presence or availability of loss avoidance/mitigation systems (leak suppression units, for example).

The risk assessment should aim to identify risk features which can be designed out. For example, it may be possible to locate water storage units on lower floors without compromising water pressure.

These points can be applied not just to the eventual permanent plumbing installation, but also to the temporary installation utilised during the construction phase.

3. Quality control

Quality control relates not only to the quality of materials and design, but also to the experience and competence of the contractors who will be installing plumbing systems.

Employers/property owners should request evidence of professional qualifications; membership of professional bodies; and on-site experience. If relatively inexperienced operatives are physically undertaking work, a system of supervision and checking is essential.

There will also be additional considerations where operatives on site are foreign nationals meaning there are additional requirements in terms of both ensuring clear communication and assessing the relevant local qualifications and membership of local industry bodies.

4. Installation standards

It is strongly recommended that there is a system of independent certification of work. Self-certification by the installing contractor is generally not acceptable.

All contractors should be expected to work to industry recognised codes, which should be clearly defined in all work specifications and contracts. There should be strict compliance with manufacturers' guidelines and installation manuals. Where supplier training is required, it should be ensured that this is delivered.

New plumbing installations must be subjected to a fully documented pressure testing regime. Each test should be attended by a person with the competence and knowledge to be able to identify problems and isolate the system. In addition, there should be a full audit trail from components used through to testing and commissioning procedures.

5. Mitigation

Temporary supplies should be switched-off out of hours. And, in all circumstances, there must be:

- a means for detecting when water is flowing when it shouldn't be
- a means for rapidly shutting down the system when such a flow is detected. Suppliers such as Waterguard offer a range of such products.

For water management/leak suppression systems, the following should apply:

- they should be installed on the incoming risers
- the devices should have the facility to monitor normal patterns of water usage so it can be programmed to shut off supply when these patterns are exceeded
- the devices should be capable of signalling unusual water flow
- there should be integral battery back-up for situations where the site is not receiving power.

Existing water systems should be drained down where possible, and this is particularly true when severe weather events are forecast.

6. Emergency response

Emergency procedures should be clearly defined within the WMP. In addition:

- a method statement for the isolation of water should be produced, and updated if and when necessary
- security guards, if present, should be trained in these procedures, and should be encouraged to be vigilant for any signs that an escape of water is occurring
- all instances of water escape should be fully investigated and documented, not least to ensure that any insurance claims run smoothly.