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BUSINESS RISK SUPPORT

Escape of Water – Construction

Escape of water (EoW) related incidents have increased across all building types and sectors in recent years and consequently are now one of the most likely sources of insurance claims. This is reflected in statistics produced by insurers and associated organisations; in 2019 the Association of British Insurers (ABI) put the value of domestic and commercial water damage claims paid at £981 million, with the average cost of a water damage claim also known to have increased significantly in recent years.

The construction sector has not been immune from the escalating number and costs of escape of water incidents, with these often having a significant impact in terms of project disruption, delays and additional costs. Incidents near completion and fit-out have also been known to adversely affect sales on speculative developments, for example, with the public relations consequences of a water damage incident linked to an issue with fit-out quality not to be overlooked. While EoW incidents are often primarily associated with residential property and property developments, they can occur in all building types and sectors, with industrial, commercial, leisure, hospitality, retail, warehousing / logistics, healthcare and education sector developments amongst those adversely affected by significant incidents in recent times.

Whilst bad winters and colder weather conditions may cause peaks, escape of water incidents can, and **do** occur all year round.

In the construction sector in particular, some factors other than cold weather which are likely to have an impact on the risk include:

- the skills, knowledge and competence of those involved in the design of relevant mechanical installations, including temporary supplies, the final permanent installation, drainage, heating and sprinkler installations, for example;
- the skills, knowledge and competence of those involved in sourcing the materials and selecting and appointing contractors / trades;
- the nature of the installations involved, how they interface and their complexity;
- the structures involved and the methods of construction used. e.g. high-rise developments and buildings involving the use of materials with increased susceptibility to water damage; or those of particularly high value or where there's potential for added complexity (long lead times for example) after a loss;

- the provision of a communicated and formal risk assessment, management plan or emergency plan that addresses practical control measures and responsibilities during the design and construction phases;
- the quality of the materials used;
- the quality of the workmanship;
- the skills, knowledge and competence of those involved in completing the installation; and;
- the skills, knowledge and competence of those involved in testing and commissioning the installation; and
- arrangements for testing and commissioning.

Water damage risks are perhaps not as well understood or recognised as some other risks and consequently insufficient attention may be paid to some of the areas identified above.

Projects are ever more complex with use of pods for bathrooms and kitchens and other modern methods a feature. Increased use of pipework, such as underfloor heating systems, pipework for white goods and en-suite facilities can also heighten the risk.

Pipework in general is on the increase, with underfloor heating systems and more pipework for white goods and en-suite facilities for example, increasingly the norm.

Costs and the competitive marketplace can put pressure on both principal contractors and subcontractors, which may in turn impact the quality of materials used and the potential for investment in training and upskilling. Skill shortages in the construction sector have been the subject of discussion for some time.

Formal water damage management or emergency plans are rarely developed, meaning that measures to prevent water damage or mitigate the impact of an incident are often not identified and implemented.

There are some main areas for consideration when looking at measures and strategies to reduce the potential for and limit water damage from an escape of water. The Construction Insurance Risk Engineers Group (CIREG) has produced useful guidance and the Managing Escape of Water Risk on Construction Sites best practice document is recommended as a source of further information.

Design phase

All water distribution systems should be designed in accordance with the requirements of relevant regulations (The Water Supply (Water Fittings) Regulations 1999), with the design based on a documented risk assessment completed by a competent designer or design company. Whilst not an exhaustive list, the following factors should be considered in the risk assessment process:

- Building height, occupancy and susceptibility of materials and contents to water damage;
- Future maintenance and accessibility;

- Contractors' competence and experience required for installation, testing and commissioning;
- Design input required during the construction phase;
- Identifying isolation and shut-off valves on plans and ensuring these are appropriately labelled;
- Minimising the number of joints, where possible;
- Avoiding burying pipework in screed;
- Thermal protection requirements; and
- other means of mitigation (e.g. water management devices, flow detection devices etc.).

Features known to exacerbate water losses (excessive elbow joints, concealed pipework routes etc.) should be designed out, with features that could mitigate a loss (pressure reducing valves, easy to access pipes, water management devices) included.

It's important to make early decisions on the competence requirements for selected contractors for installation, testing and commissioning since this is critical to the procurement process and to enable those with responsibilities for project management (invariably the principal contractor) adequate time to vet and appoint suitable contractors.

Pre-qualification procedures should be implemented to ensure that suitable competent contractors are appointed, with relevant considerations including:

- previous experience (including specific experience of the systems and equipment involved);
- external accreditations;
- qualifications, experience and training of workforce;
- procurement arrangements, including supply chain and access to equipment and accessories that are compliant with relevant regulations and standards;
- the extent to which work is subcontracted (use of direct employees, subcontractors or agency personnel, for example);
- proposals for on-site supervision and competency of supervisors / managers;
- agreement and understanding of testing and commissioning arrangements;
- sight and sign-off of risk assessments and method statements for the work;
- evidence of adequate liability insurances (including subcontractors where used);
- history of any previous claims or enforcement action (a possible indication of management standards and arrangements).

Construction phase

Defined and clear responsibilities are critical to the implementation of appropriate strategies for water damage management and so the following is suggested:

- Appointment (by the principal contractor) of a responsible person(s) to oversee day-to-day arrangements for the management of escape of water risks;
- Development of a water management plan that further defines responsibilities, procedures and actions to management and mitigate risks;
- Phasing of work to reduce the potential for damage should an escape of water occur; e.g. early installation of permanent drainage; early commissioning of water management devices; flow detection; labelling of valves as works proceed: routing of temporary services to minimise the potential for damage, e.g. outside of buildings where possible;
- Documented procedures for certification and sign-off of work during installation, testing and commissioning;
- Requiring contractors always to work to industry-recognised regulations, codes, standards and guidance, and in accordance with design guidelines and manufacturers' specifications.
- Verifying contractors' professional affiliations, approved contractors' memberships and training policies and procedures that should have been sourced as part of the pre-qualification process. Including checks (at induction for example) to ensure that individual engineers, plumbers etc. have appropriate skill sets and qualifications. Particular care should be taken where overseas workers are employed, with the need to ensure that any international qualifications are an appropriate equivalent.
- Ensuring adequate arrangements for the supervision of any inexperienced operatives.
- Requesting plumbers to complete a test joint that can be checked by an independent, suitably qualified plumbing engineer.
- Implementation of a water work permit system for all work on live systems. This would be similar to a hot work permit system and require closure by the issuer (responsible person nominated by the principal contractor, for example). The issuing of blanket permits (covering periods longer than a day or shift) should be avoided.
- Clearly defined and documented procedures for pressure testing, with the test methods in accordance with manufacturer's instructions and defined by the designer of the system(s).
- Testing should be witnessed by the appointed responsible person and an independent third party (such as a commissioning manager), and should include for example:
  - visual inspection of all joints;
  - an initial air test followed by sectional hydraulic testing to relevant standards and manufacturers' guidelines (unless otherwise directed by the designer);

  - full pressure tests on systems in their entirety, including associated equipment, and to relevant standards and manufacturers' guidelines; and
  - pull-out tests on bolts securing pipe supports.

- Isolating all temporary water supplies outside of working hours, with those responsible for ensuring this happens trained, and the procedure documented in an isolation register document or similar.

- Isolating the supply to permanent systems outside of hours or when buildings / the site is unattended. Clear communication of responsibilities for isolation, training and maintenance of an isolation registration document or similar is relevant.

- Draining down systems to protect any unprotected pipework in the event of severe cold weather being forecast.

- Providing water management devices and shut off devices on temporary and permanent systems, including:
  - the main temporary water supply and, if installed, between any booster pump and water tank. The device should to be set up to operate automatically, shutting the system off out of hours, monitoring flow during operation and shutting the system down off in the event of abnormal flow;
  - at the mains water inlet, before any booster pump, and on each floor / storey in permanent systems;
  - on all other systems, including for example underfloor heating, chilled water and any automatic refill systems.

  Water management devices must:
    - be set to shut off supplies automatically out of hours;
    - signal audibly and remotely so that designated persons are alerted when small flows are detected;
    - incorporate battery back-up, with fail to safety (shut off the supply);
    - be linked to a manual isolation device on site;
    - remain fully operational until handover.

- Establishing procedures for emergency response, with these outlined in the Water Management Plan. These procedures should be clear and include reference to required training and emergency contact details, for example.

Conclusion

The challenges and implications associated with water damage are significant and wide ranging, and whilst direct damage may be addressed by insurance provision in many cases, the potential for significant uninsured financial losses and the impact on a business's reputation are factors that clearly cannot be ignored.

The above, coupled with legislative requirements renders a systematic approach to design, procurement and installation essential, with water damage management plans critical to ensuring that the correct procedures are adopted and implemented, with responsibilities clearly defined.

Whilst measures aimed at preventing an escape of water in the first instance are likely to sit at the top of any hierarchy of control, the role that water damage management devices can play in preventing and mitigating losses must not be underestimated. Where the benefits can be explained to clients and ultimate end users of buildings, it may also be the case that such devices will be maintained past the construction phase and when buildings become operational.

Further information

https://www.wras.co.uk/consumers/what_are_the_water_regulations

https://www.gov.uk/government/publications/sanitation-hot-water-safety-and-water-efficiency-approved-document-g

Managing Escape of Water Risk on Construction Sites – includes an example Water Management Plan template.

https://www.allianz.co.uk/risk-management/preferred-suppliers/leak-detection-and-prevention.html

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