How to Recover Occupied or "Protected" Cellars Following Flooding

"Waterproof" basements may be created during the build process or are rooms that have been converted into occupied space by utilising existing underground storage, existing cellars or utility spaces. It is very important to understand this difference when restoring residential basements back to their pre-flood conditions.

When dealing with cellar or basement living spaces that have been affected by flooding it is important to understand the impact and implications of the effects of floodwater within the fabric of the basement. All the potential implications to the finishes and waterproofing system must be explored and understood in order to provide a timely, cost effective and reliable repair.

Waterproofed Basements are designed with the prime purpose of keeping water outside the internal area and providing an internal habitable living space. Waterproofing of below ground structures is achieved by using one of 3 systems (as described in BS8102- 2009).
Type A = Barrier protection (commonly referred to as Tanking) either applied externally or internally which relies on the membrane to keep the water out.
Type B = Structural integral protection - where the structure itself (waterproof reinforced concrete) is the protection.
Type C = Drained protection - non-pressurised managed system using cavity drained membrane directing water to drainage sump or gravity.

A waterproofed Basement is designed to keep water out however, when flood water comes over the top of the waterproofing system it can act to retain the water. The waterproof system has no route of drainage and does its job in reverse – keeping the water in! The flooded basement can become a large tank of water.

Note
This guidance considers cellars that have been built or converted using recognised and approved forms of waterproofing. Many cellars have been converted into living accommodation by builders and homeowners without specialist knowledge in ways that do not comply to any recognised standard. In these situations the insurer must understand that these conversions were always likely to fail and do not comply with current building regulations. It is highly likely that if these basements are repaired without the correct level of waterproofing by a competent waterproofing contractor, that they are very likely to fail as a result of future groundwater ingress.

Insurance companies and contractors who undertake work in occupied basements without fully complying with the guidelines set out in BS8102 and PCA codes of practice may well be liable for future water or damp ingress that are not connected with flooding but are the result of "normal" ground water conditions.

Recovery
The first action is to pump out the water, when the surrounding flooding has receded! Don't pump into drains that are already full or onto existing flooded land. Once all standing water has been removed the internal conditions of the basement, fittings and finishes can be assessed.

Flood water will saturate and affect all the wall and floor finishes, such as plastered walls and solid/timber floors as well as any fittings and fitments, kitchen units etc. Generally the fitments can be removed without too much disturbance however this is not the case of the material finishes that have been applied to the walls and floors. Removing these will generally involve damaging the integrity of the Waterproofing system that the finishes have been applied to.

It is strongly advised that the original Basement Waterproofing Installation Company such as a PCA Waterproofing Specialist should be brought in as soon as practical to assess the effects of the flood event and advise on what can be stripped out carefully, what can be removed and what will be damaged. The Waterproofing Specialist is able to carry out sympathetic stripping as they will understand the existing waterproofing system and may in some instances be able to save parts of the original system.

It is possible to introduce drying and dehumidifiers to remove the residual moisture retained within the structure however the use of impervious barriers designed to keep groundwater out of the cellar can trap floodwater. Drying can be time consuming and slow in converted cellars.

Wall Finishes:
Free-standing dry lined walls such as timber or metal framed structures with plasterboard finishes are best removed completely to expose the waterproofing membrane. Curtain hung Type C cavity drainage membrane (CDM) and internally applied Type A tanking

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material can sometimes be saved. However any Type C meshed CDM with plaster or dot/dab fixing or batten fixed plasterboard is likely to be damaged.

There may be insulation behind the dry lining which if not of "closed-cell" will be saturated and have to be removed. Plaster finishes applied directly on to solid waterproof concrete walls or internal cementitious tanking systems may be heavily contaminated. If this is the situation, they cannot be dried effectively due to the hygroscopic contamination. Gypsum based plaster will need to be removed very carefully to expose the tanking material or waterproof concrete.

Floor Finishes:
The profile of the CDM effectively traps large volumes of water that cannot be removed through screeds, tiles or paint.

In almost all situations where cavity drainage membranes have been used horizontally as part of the waterproofing system, any finishes that have been laid over them will have to be removed. This process will almost inevitably lead to damage to the membranes so these too will need to be replaced. Insulation and timber decking will be adversely affected by water trapped by the membranes they will retard drying and de-nature quickly so should also be removed and renewed.

General Principals
As many of the materials used in the wall and floor finish will be reluctant to dry and lack durability, widespread stripping out and the renewal of finishes and the waterproofing barriers is unavoidable.

Dependant on the waterproofing system in most cases it is neither practical nor effective to repair the systems. It is important that the Basement Waterproofing Specialist is involved from the outset. They should assess what can be retained by drying out and what requires to be removed carefully without compromising the waterproofing system.

Unfortunately in the majority of situations a total strip out of all finishes and waterproofing may be the only practical and commercial solution.

With Type C systems although the wall and floor membranes will be almost certainly be damaged by the strip out process, drainage channels and sump and pumps may not have have sustained damage and can often be re-used.

Type A systems can sometimes be adversely affected by forced drying. They are also very susceptible to mechanical damage during strip out and reinstatement. If cracking, shrinkage and salt contamination is seen at any stage during the drying and recovery process then further action will be needed. Specialist guidance must be sought in any situation where flooded basement living spaces are being recovered.

Type A (tanked systems) and Type B waterproofing systems may require limited repair when fully exposed. However if the structural integrity of the building has been affected or the damage sustained to the system is widespread then full renewal of the waterproofing layers may be the only practical or economic solution. Again, Specialist guidance must be sought for repairing these systems.

Flood Resilient Design
The future design of the waterproofing system should be adapted to take into consideration the likely risk of a similar future event. Most waterproofing systems are designed to finish at damp proof course level (at ground floor level). The underground waterproofing can be designed to extend to a higher (safer) height to provide some resilience to future flooding but this must be part of an overall package of measures that considers everything including doorways, openings, airbricks etc.

The Property Care Association represents specialists in waterproofing and the repair of buildings that have been affected by water or dampness. The PCA are pleased to be able to work in partnership with National Flood School to provide guidance and information aimed at improving recovery outcomes for homeowners and insurers.

This guidance note is written and produced by the Property Care Association

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