



## WHITE PAPER

### Waterproofing a basement

**Rising property prices coupled with a general shortage of suitable building land means developers, commercial owners and householders are increasingly looking to make the best use of the space they can. As a result, the UK is seeing basements – both new build and retrofitted - become increasingly popular. In tandem, the UK’s structural waterproofing industry is being called upon to deliver a safe, secure watertight solution for underground living. This article offers a background into the factors associated with the emergence of basement structures, and a general guide into methods of waterproofing.**

Regarding building development, the current government emphasis is on increasing housing density, whilst reducing the amount of development on greenfield land. For these reasons many people have been looking upwards when increasing the size of their properties, with developers building taller three-storey properties and loft conversions. However, such properties do not suit every situation and planning permission can be difficult to obtain for three-storey buildings, especially in rural areas where they can be seen as dominating.

One answer to this problem may be found in the increasing trend for basement development. A basement can enlarge the floorspace of a two-storey property by up to 50%, without increasing the footprint of the building. Basements can actually suit building works being undertaken on brownfield, or previously developed sites, because much of the poor substrate beneath the building is removed and on contaminated sites the cost of reinstatement with good soil is much reduced.

Unlike the dark, damp coal cellars often found in older properties, modern basements are light, airy living spaces, which can even incorporate windows or light tubes to allow use of natural light. Older basements can be modified into modern-day living spaces and it is even possible to retrofit basements into existing properties.

In addition to providing extra living space, creating a basement is also an environmentally friendly way of saving insulation material. Below-ground living space is naturally insulated by the surrounding soil and there is some evidence that the existence of a basement can have thermal benefits over identical properties that do not have a basement. It is no wonder then that basement fitting and conversions are becoming a popular way of increasing living – and working – areas.

The Property Care Association (PCA) is the trade body representing professionals in the structural waterproofing industry and has seen a massive rise in the number of contracts undertaken by its members to waterproof basements, both new-builds and conversions. It has recently launched a national campaign stressing the importance

that any basement waterproofing works are carried out by a reputable firm, with the specialist knowledge and experience required to undertake such projects.

For any basement works, waterproofing is an essential consideration and even in areas with high water tables, an effective solution can be introduced to keep structures watertight. However, if this crucial factor is overlooked, the results can be devastating.

Surveyor Stephen Hodgson, deputy director of the PCA, says that in extreme cases a poorly waterproofed basement can be subject to catastrophic flooding, which could destroy all the contents of the room, but more commonly simple dampness of the atmosphere can make the space cold, uninviting and cause deterioration of items sensitive to damp.

Stephen said: “BS8102 (Code of Practice Protection of Structures Against Water from The Ground) provides the basis for basement waterproofing design. The code describes three forms of construction that can be employed when creating dry rooms below ground, Type A, Type B and Type C.

“Type A is usually referred to as ‘tanked protection.’ These are structures that have no integral protection against water penetration and rely totally on a waterproofing membrane to keep water out. These structures can be formed in masonry or in concrete.

“If a waterproofing membrane is included during the construction of the cellar, it may be applied internally or to the outside of the structure or, in some cases, sandwiched between two skins of masonry or concrete. Multi-coat renders, cementitious coatings, epoxy resin systems and adhered bituminous sheeting are examples of Type A waterproofing.

“Type A waterproofing is ideally suited to many types of waterproofing projects in both new build and renovation. Product selection, design and application are critical. Cracking, structural movement or mechanical damage following the application of the system will always compromise the integrity of a Type A system.

“Structures built with a water resistant shell are referred to as Type B waterproofing systems. These will usually be constructed out of reinforced concrete to an appropriate design code, such as BS8110 or BS8007, which gives guidance in the grade of concrete to be used and spacing of the reinforcing steel.

“This type of waterproofing system is predominantly used in new build basements but can also be considered in some retrofit cellar applications. Should a Type B system fail then a type A or C system can usually be utilised to affect a remedy.

“Type C or “drained protection” systems are now very common in basement renovations and conversions, but their use is growing in new buildings as well. Type C systems rely on a drained cavity within the basement structure. There is a permanent reliance on the cavity to collect groundwater that enters through the fabric of the structure. The drainage system directs the water to a drain or sump, where it can be removed from the building by gravity or pumping.

“Type C systems have developed rapidly over the last two decades. Contractors now have access to some fantastic products, these include, high-density drainage membranes, advanced sealing and fixing systems, purpose designed perimeter drainage channels and state-of-the-art sump and pump packages. Most pumping systems now incorporate back-up pumps and batteries and an audible alarm. It is even possible to install a system that will call people on their mobile phone if it detects a fault.

“The choice of waterproofing methods appropriate to the individual conditions of the build is vitally important and such a judgement is best undertaken by a specialist waterproofing surveyor. A good start in the search for such a person can be made by contacting the PCA.”

By choosing a PCA member to undertake basement works a developer or homeowner can feel secure in the knowledge that members must satisfy strict criteria for the employment of qualified staff. The PCA regularly inspects member companies to ensure continuous adherence to specified standards of performance.

It is now possible for PCA members to guarantee waterproofing work and they are bound to honour their guarantees, should any failure in the waterproofing take place. Furthermore, the Association is a member of TrustMark, the scheme supported by government, to help property owners find reliable and trustworthy tradespeople to make home improvements.

To find a PCA member across the UK property professionals and developers, as well as homeowners, log on to the Property Care Association’s web site on [www.property-care.org](http://www.property-care.org) and select the ‘Find a Member’ option.