



JOHN NEWTON
WATERPROOFING SYSTEMS



The Guide To Waterproofing A New-Build Basement



John Newton & Company is the leading independent supplier of basement waterproofing and damp proofing solutions in the UK. Newton waterproofing systems are fully compliant with BS8102:2009 regulations. For further information and a list of registered installers in your area, phone 01732 360 095 or visit www.newton-membranes.co.uk

The Guide To Waterproofing A New-Build Basement

New-Build Basement Waterproofing – Design Strategy

On a daily basis we field enquiries about the best way to make a new-build basement waterproof. The waterproofing method adopted for a new-build basement requires careful consideration as failure to make the correct decision can have a major impact on the effectiveness of the system and the potential use of the basement. In addition, consideration has to be made for the repair of the waterproofing system if failure were to occur and the consequential loss and the legal disputes resulting from the failure.

Implications of BS8102 for New-Build Basements

In deciding the method for waterproofing a new-build basement it is advisable to follow the recommendations within BS8102:2009 'Code of Practice for Protection of Below Ground Structures Against Water From the Ground'.

The standard advises on the types of waterproofing available and confirms the performance grade to be achieved:

Type of waterproofing:

Type A (Barrier) protection - A barrier to water ingress is applied to the inner or outer surface of the structure

Type B (Structurally Integral) protection - The structure is formed as a watertight construction and requires no additional protection

Type C (Drained) protection - Water entering the structure is received by planned cavities or voids and safely removed

Grades of waterproofing protection:

Grade 1 - Some water seepage and damp is tolerable depending on the intended use. Car parking, plant rooms etc.

Grade 2 - No water penetration is acceptable. Damp areas are tolerable depending on the end use. Plant rooms, workshops etc.

Grade 3 - No dampness or water penetration is acceptable - Ventilated residential and commercial areas such as homes, offices, shops etc.

Newton System
100 200 400

Protection against water ingress by a 'barrier membrane' applied to the structure.

Type 'A' Protection

Newton System
300

'Structurally integral' joint seals and maintainable interjoint protection against water transmission

Type 'B' Protection

Newton System
500

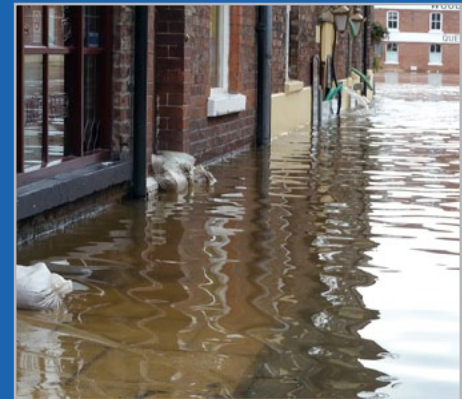
An internally maintainable 'drained system' with dedicated ground water discharge management

Type 'C' Protection

Newton provide waterproofing products for all 3 types of waterproofing defined within BS8102



BS8102 'Code of Practice for Protection of Below Ground Structures Against Water From the Ground'



BS8102 specifies that the waterproofing system needs to be designed to be fully functional in flood conditions



Newton System 500 is installed in this incredible property, it works by redirecting the water rather than attempting to hold it back

The Guide To Waterproofing A New-Build Basement

BS8102 Advice For Ground Water, Design Team & Combined Waterproofing Systems

Site Investigation Regarding Geology, Hydrogeology and Topography

Where comprehensive site investigation regarding the geology, hydrogeology and topography, both current and historical, in relation to the below ground structure are not possible, or the results are inconclusive, the designer should design both the structure and the waterproofing of the structure to be able to deal with a full head of hydrostatic water pressure - full saturation of the ground. BS8102:2009 is advising that you need to be very sure that your examinations are conclusive and demonstrable before deciding that the risk of water pressure bearing against the structure is low.

Inclusion of a Waterproofing Specialist as Part of the Design Team

A "Waterproofing Specialist" should be included as a part of the design team so that an integrated waterproofing solution is created. All design decisions made by others that might have an impact on the waterproofing design should be brought to the attention of the waterproofing specialist/designer or installing contractors. Final decisions and any recommendations should be approved by the specialist. Here BS8102:2009 is suggesting that in most cases the design team is not designing earth retained structures and so would not normally have to include a waterproofing specialist. That team, when encountering a retained structure, will very often not have the experience or expertise to understand and design against the very real risk of water ingress. Bolting on a waterproofing specialist to the design team ensures that a fully qualified person with the required skill-set is now part of that design team.

Combined Waterproofing Systems

Consideration should be given to the use of combined protection (i.e. Type A plus Type B, Type A plus Type C or Type B plus Type C) where in a single system: a) the likelihood of leaking is high, b) the consequences of leakage is unacceptable, c) additional vapour checks are necessary for a system where unacceptable water vapour transmission could otherwise occur. The decision to use a combined approach of two or more types of waterproofing will always be based up on a risk vs cost calculation. Often other factors will dictate the use of a second or third type of protection, such as ground gasses or aggressive agents found within the ground water.

BS8102 and Newton Specialist Basement Contractors (NSBC)

Whether waterproofing a new-build basement or an existing structure, we will always recommend that the preferred waterproofing system be installed by one of our registered contractors. When involved in the design they are able to offer insured guarantees for both the installation and the design of the waterproofing system, and with most of our contractors having suitable PI allowing you to delegate the full design liability for the waterproofing aspect of the project to them.

NSBCs are able to fulfil the role of waterproofing specialist as suggested by BS8102:2009 and we see that waterproofing contracts run more smoothly and have less issues where one of our NSBC contractors are also the waterproofing design specialist on the design team.

For a list in your area, ring 01732 360 095 or fill out our online form:
Request List of Registered Installers.



*Newton Specialist Basement Contractors
fulfil the role of 'waterproofing specialist' as
recommended by BS8102:2009*

The Guide To Waterproofing A New-Build Basement

Newton Recommendations for New-Build Basements

Newton provide a a number of products across all three types of waterproofing, all which fully comply with the recommendations within BS8102:2009.

It is widely recognised that the starting point for a dry basement is to build a structure capable of providing primary resistance to the expected water pressure. A well designed structure incorporating well placed concrete around correctly designed reinforcing steel will require attention only at the construction joints using our **System 300 waterbars** to become a Type B waterproofed structure that will be suitable for Grade 1 environments such as car parks. At John Newton and Co. we believe that this produces a good starting point ready for waterproofing to higher grades with other waterproofing types and products - it is much safer to add barrier or drained waterproofing to a structure that is already fully or almost fully watertight than to add those membranes to a poorly designed and potentially very leaky structure.

The Type Of Waterproofing and the End Use of the Building

The end use of the building will influence the type of waterproofing decided upon to waterproof to the higher habitable grades. In most cases **Newton System 500**, our cavity drained (Type C) waterproofing system will provide the safest solution to provide a totally dry Grade 3 environment, especially where vapour control is required, although factors such as complicated internal layout or thermal mass heating requirements may preclude the use of an internal drained waterproofing system and so our **System 400** externally applied barrier and **System 100** internally applied cement based coatings (both Type A) may be required. We would advise though that the waterproofing should be maintainable which is much more difficult with Type A waterproofing. However, when used with **Newton 302 and 304 injectable waterbars**, maintainability that provides both grouting and leak sealing can be achieved to Type A plus Type B combined systems to all habitable grades.

Associated Risks With Each Waterproofing System

The designer should take into account the risks associated with each type of system to evaluate the correct type of waterproofing or combined types of waterproofing and should bear in mind the following:

It is important to note that the success of externally applied Type A membranes depends on the highest quality of workmanship. The quality of the concrete surface, especially with bonded membranes such as bitumen sheeting, is critical and is not easy to achieve' – IStructEdocument for 'Design and construction of deep basements'.

The judgement in the overview of the High Court case 'Outwing vs.Weatherald' agrees that 'it is not reasonable or realistic to expect a bonded sheet membrane to be applied without any defects at all'. Therefore if you incorporate a system which needs to be 100% defect free to work in your design and it fails you may be accountable.

'Leaks caused by defects in external membranes are practically impossible to locate and repair, since the water invariably enters the structure internally through cracks or other vulnerable points, such as any movement joints, at some distance from the external defect' - IStructEdocument for 'Design and construction of deep basements'.

Because consideration should be given to the 'form and feasibility of remedial work' which means if there is a problem, the ability to get back to the structure to diagnose and determine the cause and location and then rectify the problem. - BS8102:2009

Because consideration should be given to providing a 'maintainable' waterproofing system. – BS8102:2009

The Guide To Waterproofing A New-Build Basement

Newton Solutions For All Types of Waterproofing To Reduce Risk

Newton 403 HydroBond is pre-applied to the blinding ready for the forming of the concrete raft and the shuttering (permanent or temporary) for the forming of the walls. The product has a fleece inner surface that the wet concrete absorbs into so that when cured, a permanent mechanical bond is formed. This means that if a defect were to occur in the membrane surface, water can only enter at the defect and is unable to move to the joints and so cannot pass into the structure. If the defect happens to be at a joint, water can still not enter the joint due to the solid uPVC waterbar, **Newton 310 eFlex**, which is also applied to the shuttering or blinding and also fully bonded to the concrete. In addition, **Newton 403 HydroBond** has a layer of a hydrophilic polymer that swells when in contact with moisture and so will quickly and permanently seal defects in the membrane. The combination of the self healing and bonded properties makes **Newton 403 HydroBond** a very safe option where Type A membranes are required. Used in conjunction with the **Newton System 300** injectable waterbars, it is possible to include design considerations for all of the warnings cited in the previous page within a Type A plus Type B combined waterproofing system.



Newton 101F Cementitious Flexible Waterproofing Membrane



Newton 403 Hydrobond Bonding Membrane for Raft and Wall Waterproofing



Newton 301 AquaProof, our unique coated metal construction joint water bar



Newton 508 BBA Approved Cavity Drain Membrane

Other waterproofing requirements such as protection at podium decks, pile caps etc. can be successfully waterproofed using Newton waterproofing systems, often using a combination of systems and products.

The Guide To Waterproofing A New-Build Basement

Case Studies

Domestic Basement, Guildford, Surrey

Newton System 500 designed and installed by a Newton Specialist Basement Contractor

The owners of this stylish property near Guildford in Surrey were looking to expand the living space without having to move from the area. Due to planning constraints they were not able to extend their house out and so decided to create an entirely new living space in the form of a basement.

Having consulted their architect and structural engineer, it was time to consult a professional waterproofing contractor who could take ownership of all aspects of the vital waterproofing works. A Newton Specialist Basement Contractor (NSBC) was brought in to design and install a robust and cost effective waterproofing system in accordance with BS8102:2009. **Newton 508** Cavity Drain membrane was applied to the walls and **Newton Basedrain** was laid on top of the new structural slab, followed by a 65mm sand and cement screed on top of the membrane.

*The NSBC installed **Newton System 500** with no minimal surface preparation and in a timely manner without the need for extensive drying out times as with other internal tanking systems. The system was installed with service entry points into the drainage channel to enable maintenance of the system - a new design requirement under BS8102:2009.*



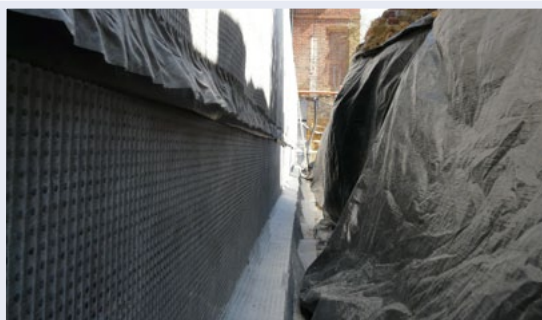
The owners of this stylish property wanted more space and created a new basement



Newton 508 cavity drain membrane was applied to the walls



Newton 508 cavity drain membrane was applied to the walls



Newton 902 applied prior to Newton 410 Geodrain

Combined Waterproofing, Charts Edge, Kent

Waterproofing a new-build basement with System 500 internally and System 400 externally

This expansive new-build basement was designed to become an integral part of a historic manor house. The architect and structural engineer wanting a robust and guaranteed basement waterproofing solution and commissioned the services of a Newton Specialist Basement Contractor.

This new-build block structure was built off a reinforced concrete raft. **Newton 410 Geodrain** was installed as a drained waterproofing layer underneath the slab. **Newton 902** was then painted in two coats on the vertical walls as a Type A waterproofing protection then the **Newton 410 Geodrain** was affixed vertically and lapped to the **410 Geodrain** underneath the slab. The secondary system installed was the internal **Newton System 500** drained cavity system. **Newton 508 membrane** was applied to the walls and floors and **Newton Basedrain** was installed in a complete perimeter ring at the base of the block work. The **Basedrain** conduit offers the ability to maintain the waterproofing system - a mandatory design requirement in BS8102.

*The installation of the dual **Newton System 400** and **System 500** means that the structure itself is kept dry and the external drained layer moves any water away from the structure before it comes into contact with the retaining walls.*

The Guide To Waterproofing A New-Build Basement

Case Studies

Lime Kiln House, Scotland

Waterproofing a modernist inspired home with Newton System 500

This plot was an old Lime Mill and had existing kilns which needed to be preserved as a part of outline planning permission being granted. After extensive preparation works, the client embarked on the construction of a modernist-inspired home which was built into a sloping site to minimise the impact on the surrounding environment.

Built of reinforced concrete and banked into the hillside, all waterproofing issues were easily solved with the introduction of **Newton System 500**. With the **Newton 508 membrane** curtain hung to the retaining walls and **Basedrain** sat on the new RC slab, 50mm of closed cell insulation was used to not only aid U-values but also as a means of raising the **Newton 508 membrane** above the height of the **Basedrain**. This meant that all ingressing water would be diverted to the **Basedrain** and water was able to gravity feed to the front elevation of the property for removal. Key to this approach was the introduction of a 65mm screed (with underfloor heating, pictured right) that forced ingress back to the **Basedrain** for removal.

The main contractor was amazed at the speed and effectiveness of the system. He mentioned that it was without a doubt the most uncomplicated and straightforward aspect of all the construction works.

Further Information

For any advice on your waterproofing project, please contact John Newton & Company on 01732 360 095 or info@newton-membranes.co.uk

Contact John Newton & Company for:

- **Free technical advice** - our team of experts can design and modify technical drawings in all formats and design a waterproofing solution best suited to your needs
- **RIBA Approved CPDs for architects** - New CPD for specifiers on the changes to BS8102: The Protection of Below Ground Structures Against Water From the Ground - Book Now
- **Guaranteed installation from a Newton Specialist Waterproofing Contractor.** Our nationwide network of damp proofing and basement waterproofing contractors offer guaranteed solutions.

Testimonial

"We have been working with John Newton & Company for the past 14 years, and I would highly recommend their products for waterproofing new-build basements, as they have an expansive product range for all waterproofing scenarios; Type A, B, C and combination systems. In addition, their technical support and customer service is second-to-none"

- David Wing, Wing Waterproofing (Newton Specialist Basement Contractor)



This case study featured on Channel 4's Grand Designs



Application of Newton 508 cavity drain membrane to the walls

JN

JOHN NEWTON
WATERPROOFING SYSTEMS