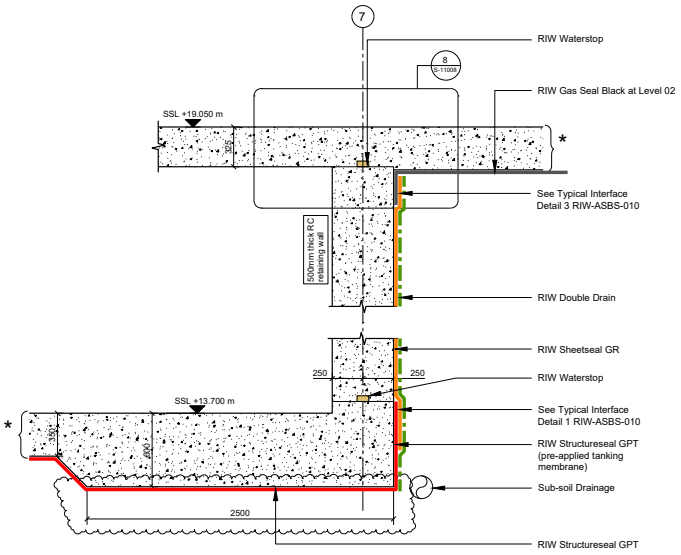
BS 8102: 2022

WHAT THE LATEST EDITION MEANS FOR THE INDUSTRY

British Museum WCEC

British Standard BS 8102, the Code of Practice for waterproofing of below ground structures has recently been updated to reflect new practices and materials, provide increased clarity and ensure higher quality waterproofing designs and installations.

This guide looks at why it has been updated and what it means for waterproofing specialists, specifiers, contractors and end clients. This paper goes beyond simply outlining the changes and instead considers the implications and benefits of the updates.



Overview of BS 8102

BS 8102 is the British Standard Code of Practice for waterproofing of below ground structures. It covers all areas of protecting buildings from water including design philosophy, site evaluation and the design of waterproofing systems as well as installation and maintenance. It also provides detailed guidance on the implementation of Type A – barrier, Type B – structurally integral and Type C – drained systems alongside combined solutions for addressing water ingress.

The guidance provided in the Code of Practice has evolved over the years from CP 102: 1973 to the latest edition published in March 2022 to reflect updates to best practice. The title of the document has also evolved to reflect these changes. In 2009 it was titled 'Protection of Below Ground Structures Against Water From The Ground'. This has been replaced with 'Protection of Below Ground Structures Against Water Ingress' in 2022 in recognition that it is not necessarily just ground water that the waterproofing must protect against. Water ingress may also be as a result of events such as flooding, or water main leaks and the design of the protection should account for this.

Why update BS 8102?

BS 8102, like all British Standard Codes of Practice, must reflect the most up to date guidance in that area. BS 8102 had last been revised in 2009 and since then there have been advances in waterproofing strategies, including new technologies and systems, and improved best practice approaches. BS 8102 was also updated for better harmonisation with the current guidance provided in other standards, especially those that have also been revised since 2009.

KEY THEMES AND CHANGES IN BS 8102:2022

The 2022 edition includes many updates to wording, terminology and guidance but there are key themes that emerge when looking at the revisions as a whole. It is important to consider what these trends mean for everyone involved in the design and installation of the waterproofing systems, as well as on-going operation of the building.

Role and requirements of waterproofing specialist

One of the key changes in the 2022 version of BS 8102 is the renewed guidance on waterproofing design specialists (WDS) in the design process. While the requirement for a waterproofing specialist to be included in the design team has always been present in BS 8102, the 2022 revision refines and strengthens this guidance. It states that the waterproofing specialist should be included as early as possible in the project and specifies that in terms of the RIBA Plan of Works, the specialist should be appointed at RIBA Stage 3: 'Spatial Coordination' at the latest.

At RIW, we see this as a positive change as we know from experience what the value of early involvement is. On some projects, a waterproofing specialist has been brought in later in the process and this has meant that the optimum waterproofing strategy is more challenging to implement.

The new wording in the code of practice specifically says that a waterproofing specialist should be 'appointed'. This is important language as it demonstrates that the waterproofing specialist does not need to have a contractual obligation to fulfil this role. However, we have long advocated that if an individual or organisation takes on the role of a WDS they do have professional obligations to fulfil and they should consider themselves to be sharing responsibility for the robustness and compliance of the waterproofing design.

Selection Criteria

To ensure that someone with the correct skills fulfils this role, BS 8102: 2022 provides additional criteria for selection than previous editions and recommends that the waterproofing design specialist should:

> ***"Be suitably qualified and experienced commensurate with the type and size of the proposed project."***

The 2022 update does not state the specific qualifications that they must have, however the Certificated Surveyor in Structural Waterproofing (CSSW) qualification is accepted as the minimum within the industry. The CSSW qualification is gained by completing a Property Care Association (PCA) accredited course, which is offered by a number of organisations. As such, this does not guarantee that the person is suitable for the project in question. Therefore, the depth of knowledge of the specialist and experience across a wide spectrum, must also be considered – something that is now expressed in the BS 8102.

This is a welcome update from previous editions that simply required that the WDS be 'suitably experienced', which leaves a significant amount open to interpretation.

For example, this could be interpreted as meaning a suitable number of years' experience in waterproofing of any type. However, if this experience only comprised of a single type waterproofing system on residential developments, then their experience would not be appropriate for fulfilling the waterproofing specialist role on mid to large-scale commercial developments or projects that include extensive or complex below ground structures.

In terms of the type of professional who can fulfil this role, there are many who would meet the criteria. This could include waterproofing contractors, independent waterproofing consultants or specialist waterproofing system manufacturers and suppliers, such as RIW. Members of our technical design team have CSSW and building and engineering qualifications as well as experience on a wide range of project types from individual high-end residential projects to major multi-million pound developments such as The Francis Crick Institute building and the extension of the British Museum.

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Drive for greater collaboration

Another theme that is clear throughout BS 8102:2022 is the need for collaboration at every stage of the project. To achieve a successful waterproofing strategy, perhaps more than any other area of a building's design, requires a partnership between those involved in the project.

A close collaboration between members of the design team is required from the earliest stages to ensure that the most appropriate and robust waterproofing solution is incorporated into the building's design. Fostering a close working relationship between the members of the design team will also ensure a smooth build process and an issue-free handover to the client. Essentially, the aim should be to collectively mitigate and manage risk throughout the project.

At RIW our 360° Design Advantage Plus, which has been designed for large or complex projects, is based around a consultative approach where we work in cooperation with architects, engineers, contractors and end clients to simplify the design, specification and installation of waterproofing. On major projects there are three key phases and at each of these the design team must collaborate. There are also updates to BS 8102 that relate specifically to these.

PHASE 1 – DESIGN

At this stage the waterproofing specialist will seek to understand the client expectations and requirements and how this will influence the waterproofing strategy. They will also look at the site evaluation to produce a risk assessment and provide initial design guidance.

With regard to the site evaluation, the updated Code of Practice now includes a wider range of factors that may be identified during this phase that may impact the waterproofing design. This includes the effects of climate change, burst water mains, flooding and defective Sustainable Urban Drainage systems (SUDs) and sewers as well as ground gases and contaminants.

PHASE 2 – CONSTRUCTABILITY

Prior to work on site commencing, the waterproofing specialist should coordinate with the project delivery team to provide support, refine the proposed strategy and ensure the waterproofing can be implemented correctly as the project progresses.

BS 8102:2022 now includes a recommendation that service penetrations through Type B systems should be cast in-situ, and not installed after the structure has been formed, to reduce the risk of waterproofing issues. This will require close collaboration between the waterproofing specialist, building services designer and concrete contractor.

PHASE 3 – PROJECT DELIVERY

Working with all parties involved in the construction, the waterproofing specialist will be able to develop a full installation programme, method statements, bespoke drawings and provide toolbox talks to ensure operative best practice. They should also agree an appropriate inspection and test plan and undertake regular visits to provide quality assurance and check for non-conformity issues.

One of the key updates in this area in BS 8102:2022 is the increased recognition that waterproofing systems need to be protected during all phases of the construction. The 2022 version includes a new section on protecting waterproofing throughout and after construction. This requires cooperation with all those working on site, including following trades, to ensure the systems are not damaged. This possibility of damage is also something that BS 8102 states should be a consideration when selecting waterproofing systems.

While warranties and guarantees are an important part of the construction industry, in particular with waterproofing systems, in practice it can be difficult to rely on these alone. Often these documents can lack clarity and transparency, may use ambiguous language and exclusions are often buried deep in the small print. Therefore, at RIW, we believe that mitigating and managing risk through the design, constructability and project delivery phases to project handover is just as important as ensuring warranties and guarantees are in place.

Macallan Distillery

More robust waterproofing solutions

Much of the updated guidance is focused on creating more effective and robust waterproofing schemes. In the years since the 2009 update there have been many advances in waterproofing technology and development in best practice. The BS 8102:2022 standard reflects this with the changes that have been made.

As an example, the 2009 version detailed three possible configurations for Type A systems: external, internal and sandwiched. The sandwich configuration, where a self-adhesive membrane is installed internally with a loading coat, has now been removed as an option in the standard as this is now considered inherently high risk and very difficult to remedy should water ingress occur.

The guidance on combined protection has also been updated. The standard provides examples of which types of systems can be combined – Type A+B, A+C, B+C, A+B+C - and now also includes a mention of Type A+A. However, also included in the guidance is the recommendation that where a combination is used, the systems should have different performance characteristics to ensure that both waterproofing systems are not compromised due to a common cause. For instance, a cement based coating and a modified epoxy coating, which have similar limitations when bridging dynamic cracks.

The 2022 update also recommends that the compatibility of the systems in practice should be considered to minimise the risks. A waterproofing specialist, such as RIW with extensive knowledge and experience, can provide guidance on the optimum configuration and combination of different systems and technologies to achieve the performance required.

Additionally, there is now an increased focus in BS 8102 on the protection and maintainability of waterproofing systems to ensure longevity. In fact, the servicing and maintenance section 10.3 has been revised to emphasise the importance of planning the maintenance, especially of type C (drained) systems.

A new section has also been added with regard to general remedial measures, which makes it clear that strategies for repair should be a consideration from the design phase.

Improved clarity and detail

A further theme within the updates to BS 8102 is improved clarity, detail and communication of best practice approaches. For example, new sections have been added to provide specific information on pre- and post-applied membranes, including information on materials and technologies that have been developed since 2009.

Importantly, there is now a dedicated section for guidance on movement joints. This was previously included in 8.1.3. The aim of providing a separate section is to highlight the importance of getting these areas right and involving both the waterproofing designer and system manufacturer to ensure a robust solution or strategy is implemented.

There are also many new sections, expanded descriptions and additional notes underlining the importance of application best practices, such as substrate preparation, as well as communicating with the manufacturer of the system to understand application guidelines.

Another significant update in the 2022 standard is to Table 2 in Section 6.2.4, which details the grades of performance for below ground spaces. Grade 1 has been split into Grade 1a and Grade 1b with the key difference being that seepage, which is now defined separately to damp, is acceptable for 1a performance but not for 1b.

The application examples of use, such as car park, plant room and commercial areas have been removed from Table 2 to prevent confusion and the implication that it is prescribing levels of performance for a given application. For example, that a car park should be Grade 1 rather than Grade 2 or even Grade 3 if appropriate. This is another area where a waterproofing design specialist can provide significant support and value. Based on the client's requirements, early in the design stages they can offer a recommendation on the most appropriate grade, which can help to guide other design decisions.

Another key feature of the BS 8102:2022 standard is that the scope of the guidance has been expanded to provide more comprehensive guidance. There is a new section on waterproofing for Buildings of Historic Significance or Protected by Legislation. There is also a new section on waterproofing design for existing structures.

Conclusion

Waterproofing is an essential part of the design of a building and something that will only become more challenging with the effects of climate change as well as increased urbanisation demanding greater innovation. The update to BS 8102 forms part of a wider drive within the industry for closer collaboration amongst all those involved in a project. Appointing an experienced and dependable waterproofing specialist who can work closely with the design and project delivery teams throughout is essential.

RIW is here to help with any upcoming projects as an experienced waterproofing design partner

To speak to a member of our expert team, call our technical department on **01753 944 200** or email **technical@riw.co.uk**