PCA
Property Care
ASSOCIATION

Overview Document:

Summary of changes to British Standard 8102:2022

March 2022

SUMMARY OF CHANGES TO BRITISH STANDARD 8102:2022

Since its inception in 1990, BS 8102 has been instrumental in raising standards and in ensuring that underground structures provide an environment suitable for the intended use. The revision published in 2009 raised the bar even higher, to the point it is considered a world-wide leading document that many other nations have adopted when waterproofing below ground structures.

The latest revision was completed in March 2022 and builds on the solid foundations set out by the previous editions of this strong and robust document. This guidance document is aimed at providing a brief overview of the 2022 changes to the Code but should obviously not be used in place of the current or forthcoming document itself. All those undertaking waterproofing work should familiarise themselves with the new Code of Practice.

1. SCOPE

The first and perhaps one of the most significant changes, is to the scope of the document. This changes from the "entry of water from surrounding ground into a structure below ground level" to entry of water from external sources into structures that are partly or wholly below ground.

This new standard tells us that it now considers drainage outside of the structure and the risk of water coming through openings i.e., doors, light wells, etc.

Whilst the addition of "Partly or wholly" is not new, the old standard told us to consider this just in different words; however, the change in scope clearly signals that the revision will include a broader consideration for all the possible sources and entry points of water in a below ground.

2. REFERENCES

There appear to be no significant changes, just updated as appropriate.

3. TERMS & DEFINITIONS

New

- Buried deck
- Free lime
- Fully bonded
- Ground gas barrier – an amended version of ground barrier
- Groundwater
- Hydraulic gradient
- Hydrostatic Pressure
- Product information
- Water resisting admixture

Amended

- Damp patch – amended to wet but no weeping/ seepage - feels significant –
- Cavity drain membrane – of no real significance
- Waterproof – impervious to “free” water
- Fully bonded

Gone

- Vapour check

The changes to “damp patches” has the biggest implications on the document – a damp patch no longer being an area which is wet, but more specifically, an area that is slightly wet but not from the passage of water from through the structure.

4. DESIGN PHILOSOPHY

The design philosophy set out in the previous editions of BS 8102 is one of the documents’ greatest strengths and in the main this is generally much the same in the new document. However, there are a number of changes within this section which could have large implications.

4.2 DESIGN TEAM

Changes to this section are mostly relatively minor, but they now include greater encouragement for RIBA to appoint a waterproofing specialist at the technical design stage.

The likely most significant change to this section is that it now says that any final decisions or recommendations should be approved by those taking responsibility for the waterproofing design.

4.3 DESIGN CONSIDERATIONS

This section details some of the factors that should be given during the design. These include:

- The likely highest level of the water table
- Soil characteristics
- The intended use and internal finishes

The revision now suggests that the designer should give consideration to the design life and any required ongoing maintenance.

4.3.2 DEFECTS & REMEDIAL MEASURES

What has made this document so successful is that it gets the designer to consider the possibility of defects. These were either from poor workmanship and inappropriate use of materials, or the nature of that material being used.

However, consideration now needs to take into account the possibility of defects caused by "Follow on trades." How do we do this? Ensuring and recording that these conversations are had with the client. Ensuring appropriate signage is left on site, introducing procedures to ensure that in the event of damage to a system the relevant people can be contacted to inspect and undertake appropriate repairs. Encouraging education during site inductions.

Consideration be given to the risk of defects but also the feasibility of repair. This remains the same in the revised version.

Figure 1 Design flow chart

The bulk of the design flow chart has remained the same. However, two later stages have been added which acknowledges that there should be consideration that the design may alter during the installation and commissioning stages. This is in line with the consideration of defects, for defects created by follow on designs as detailed in 4.3.2.

5. SITE EVALUATION

5.1.3 WATER TABLE CLASSIFICATION

Whilst the classifications of water table remains the same, (high, low, and variable), the amendments to this section now encourage consideration of the structure particularly those that are inherently more prone to leakage such as blockwork or modular structures. Clearly a logical change, encouraging a joined-up approach, where the structure is reviewed in association with the waterproofing strategy.

5.2 INSPECTION & SURVEYING OF EXISTING STRUCTURES

A section which has seen significant revision since the 2009 version and provides detailed considerations when inspecting an existing basement.

Whilst this is a largely new section for BS 8102 much of the information is covered in the PCA Code of Practice for Waterproofing of Existing Below Ground Structures, and therefore should be standard practice to members of the Association.

5.2.3 BUILDINGS OF HISTORIC SIGNIFICANCE OR PROTECTED BY LEGISLATION

A new section for the 2022 revision acknowledges the challenges and balance that sometimes needs to be struck when looking to provide dry environments in below ground structures, of Buildings of historic significance or protected by legislation. The document identifies the difficultly of providing a fully waterproofed structure whilst retaining exposed features and advocates a pragmatic approach.

Steps that must be included when looking at buildings of this nature include an assessment of the buildings' drainage, which **should always** form part of the evaluation of the building prior to finalisation of waterproofing design.

It also states that all reasonable steps should be taken to ensure drainage is optimised and working properly and that drainage surveys form part of the process.

6. WATER-RESISTING DESIGN

6.1 GROUNDWATER

Perhaps one of the most significant changes to the document and this is in the absence of soil, geological and hydrogeological investigation, designers must no longer design to a full height of the retained ground but wherever practicable be taken above ground level by a minimum of 150mm.

Clearly indicating the need for continuity with a damp proof course. Designing this from scratch when you have the ability to influence the design is one thing but implementing on an existing structure will be more difficult. I feel this is likely where the 'reasonably practicable' will come into play.

Table 2

This has been amended in several respects. The previous 2009 revision included examples of usage, such as Grade 1 with seepage applying to car parks. With these providing some potential scope for avoidance of liability, the working examples have been removed and the focus is now on Waterproofing Designers to discuss and clearly agree the performance levels and environments with clients/stakeholders to facilitate their intended usage.

Grade 1 has been sub-divided:

- ***Grade 1a****. Seepage (slow transmission of water through discrete pathways of a structure), and damp areas (area which is slightly wet but no seepage) from both internal and external sources are allowed, if this does not impact the use of the space.*
- ***Grade 1b.*** *No seepage (slow transmission of water through discrete pathways of a structure), damp areas allowed (area which is slightly wet but no seepage).*

It could be considered that Grade 1b is a potentially difficult design to achieve, and for the most part may be more useful in the categorisation of environments when dealing with existing buildings.

The wording of Grade 2 (as below) is amended to clarify that the only acceptable source of dampness within a Grade 2 environment is condensation, i.e., no water from an external source. Therefore, it is in essence as it was before.

Grade 2. *No seepage (slow transmission of water through discrete pathways of a structure), damp areas as a result of condensation acceptable.*

Grade 3. Is unchanged:

- ***Grade 3****. No water ingress or damp patches allowed – ventilation, dehumidification, or air conditioning appropriate to intended use. This has remained the same and will still be the desired grade for habitable spaces.*

In respect of the practical application of the table, it is much the same as it was within the 2009 revision, with the exception of Grade 1. We would anticipate that many designers will just opt to employ Grade 1a, and that careful consideration of 1b will be necessary to make use of this.

6.2.5 CONTINUITY OF WATERPROOFING PROTECTION

This section has been restructured from the 2009 version to emphasise and make clear that waterproofing should be continuous with DPC level or taken to 150mm above ground level.

6.5 BURIED DECKS

Increasingly, buried decks are being used to extend the utilisable space within buildings and keep amenity space. Whilst they are becoming increasingly popular, they are inherently difficult to waterproof and providing greater focus on this within the standard is a welcome addition.

The PCA Guidance Note on Podium Decks and Buried Roofs provides more detailed guidance on buried decks and will help designers comply with the guidance set out in this revision of BS8102.

7. GENERAL CONSTRUCTION ISSUES

7.1 SITE DE-WATERING

This section has been expanded significantly from the previous incarnation and it now encourages that water ingress during construction phases should be taken into account during the design phase.

The electrical methods are the most acceptable for general survey work since a number of readings can be taken in a very short time without unacceptable disturbance to the decorations or wall face.

7.2 UNEXPECTED HAZARDS

In the event of the discovery of an unexpected hazard e.g., made ground, archaeological or geological anomalies, the design team and waterproofing specialist should be contacted.

7.5 PROTECTED WATERPROOFING

The changes to this document acknowledge that even the most robust design can end in failure through the actions of those on site who do not understand the significance of the waterproofing measures. It is now expected that every effort should be made to prevent damage during and after construction phase. The wording here makes it clear that the bare minimum is not acceptable. To fulfil this there is a clear requirement for good site education, that damage should be documented, as well as the measures previously highlighted in this document.

8. TYPE A (barrier) PROTECTION

8.1.1 GENERAL

This section advises the designer to consider a number of elements significant to barrier protection design; however, this section has also been expanded to include the addition of the evaluation of the achievable continuity within the waterproofing.

8.1.3 CONTINUITY OF WATERPROOFING BARRIER

This is an entirely new section which again emphasises the need to take the waterproofing to DPC level. It acknowledges the difficultly of waterproofing penetrations and states these should be avoided where possible.

8.1.5 MOVEMENT JOINTS

Should not be used unless unavoidable.

8.2 WATERPROOFING BARRIER MATERIALS

8.2.1 GENERAL

The biggest amendment to previous versions is the removal of sandwiched waterproofing. The document now leaves two options, either the internal or external face of the structure.

Table 3

Changes to the table are relatively minor and include:

- geosynthetic clay liners now called active core liners
- Bonded sheet separated in to pre and post applied.
- Extra column detailing the type of bond i.e., full, or partial

9. TYPE B (structurally integral) PROTECTION

From the previous version this section has seen significantly changed.

9.2.1.1 GENERAL

Some useful guidance is provided to designers who achieve some of the grades set out in the revised table 2.

- Grade 1a – the provisions in tightness class 0 of BS EN 1992-1-1 may be adopted
- Grade 2b – concrete should confirm to BS EN 1992-3:2006

This section also now promotes the use of a monolithic kicker to avoid potential areas of weakness within the waterproof structure.

Additions to the list of important factors to consider now include pour size and the implementation of an on-site quality assurance programme.

10. TYPE C (drained) PROTECTION

10.2.1.2 LEACHATES & FREE LIME

It clearly states now that all surfaces must be treated to reduce the risk of lime or salts that might obstruct the drainage system. Whilst this is included in the old standard, this is now in a new and separate section which helps highlight the significance of the issue.

10.2.1.3 FLOOR CAVITIES

In comparison to previous versions, additional stipulations have been added to improve standards of Type C installations. These include:

- Floor drainage channels should be set directly below the membrane
- Drainage channels should ideally be installed at the wall floor junction. Where not possible it suggests that the capacity of the drained cavity must be increased accordingly
- Cross floor channels for larger footprints to reduce distance to channels

10.2.2 MULTI LEVEL SYSTEMS

As we see deeper basements, a welcome addition to the revision reflects the changes in complexity of structures defined in the foreword. It provides details to ensure water can get past the suspended floor. Some of the guidance for dealing with multi floors include larger flow pipes between floors to reduce risk of clogging and drip details on underside of floors, as well as contingency planning for pipes to ensure there is sufficient flow through maintainable pipes.

10.2.4 CAVITY VENTILATION

Where ground gas/contaminants are present and Type C waterproofing is being considered, then specialist advice should be sought during the design stage. A specialist in the applicable contaminant or waterproofing product manufacturer is likely to fit the criteria as the specialist in this scenario.

10.2.5 INVERTED CAVITY DRAIN SYSTEMS

Inverted cavity drain systems are a new inclusion for the document, but states these are generally deemed higher risk. If using for this application, then the membrane must have a fall to a point where water pressure does not come to bear on joints and laps.

10.2.7 PUMPS

Battery backups have been considered best practice for a number of years and promoted in PCA guidance. The document now says they should be included to protect in the event of power failure. In addition, each needs to be individually fused and located at the lowest point.

10.3 SERVICING & MAINTENANCE

A change in title of this section from the previous maintenance and commissioning. We are now told that Type C systems should have a maintenance schedule. Previously it was only the requirements that had to be set out by the designer to the client.

Maintenance points now need to be accessible not just incorporated within the design. Clearly a logical step to avoid maintenance points being rendered redundant during later phases of the construction when their significance is not understood and subsequently hidden.

Another significant change is the first maintenance inspection should be at handover stage, so details of this inspection should be recorded. Photographic evidence at this point would be highly beneficial.

A second inspection three months later or on completion of any building works which might affect drainage, is recommended. The previous guidance had been at least once a year and whilst this has remained, the new version encourages earlier inspections to help reduce risk of failure.

11 REMEDIAL MEASURES

As with the previous versions, the issue of repairability is featured numerous times throughout the document. This section which examines the processes that can be adopted in accessing the form and feasibility of repairs to defects, has seen significant change and now provides a more focused look at the remediation of the three types of waterproofing systems.

For further information, contact:

Property Care Association
11 Ramsay Court
Kingfisher Way
Hinchingbrooke Business Park
Huntingdon
Cambs.
PE29 6FY
Tel: Tel: 01480 400000
Email: pca@property-care.org
Web: www.property-care.org

The Property Care Association incorporating the BWPDA is a company limited by Guarantee: Registered No. 5596488 England