Technical Extra

November 2015 | Issue 19

In this issue:

NHBC
Raising Standards. Protecting Homeowners

Foreword

Welcome to Technical Extra 19

I'm delighted to announce that in September we launched Standards 2016.

The Standards 2016 edition introduces the most significant design revision in over two decades, delivering a host of new features that make it the simplest, yet most informative, edition to date. Further information is provided in the lead article in this edition of Technical Extra.

The new edition becomes effective for every new home registered with NHBC where foundations are begun on or after 1 January 2016. It's important that both you and your suppliers become familiar with the new Standards. Therefore, in conjunction with the distribution of the hard copy, we have made Standards Plus – the online version of the NHBC Standards with a host of added features – freely available to all visitors to our website at www.nhbc.co.uk

Last year, we published Chapter 5.4 'Waterproofing of basements and other below ground structures'. At the time, we said that the new chapter would become effective once included in the relaunch of the Standards. I can confirm that the new chapter is included in Standards 2016, and the guidance should be followed where foundations are begun on or after 1 January 2016, although it is strongly recommended that it is adopted at the earliest opportunity. We revisit the chapter, and the importance of detailing waterproofing correctly, in this edition of Technical Extra.

With the introduction of new legislation from 1 January 2016, Wales is set to become the first country in the world to require the installation of an automatic fire suppression system in all new houses and flats. We discuss the requirements for sprinklers in Wales and transitional arrangements regarding their introduction.

In 'Avoiding common fire safety issues' we highlight the type of fire safety issues recorded whilst undertaking inspections. We provide more information on the four principal areas where improvements can be made: cavity barriers and firestopping; firestopping of service penetrations, the use of intumescent collars and wraps to service penetrations; and self-closing fire doors.

Other articles in this edition include the latest on proposals for Sustainable drainage systems (SuDS) and the introduction of a new Code of practice for heat networks. We also highlight the latest publications from NHBC Foundation.

I trust you'll find the articles in this edition of interest. Don't forget to familiarise yourself with the new Standards; they're available now from our website at www.nhbc.co.uk

Mark Jones
Head of House-Building Standards

NHBC STANDARDS

Standards 2016 and the NHBC 3D Viewer app

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

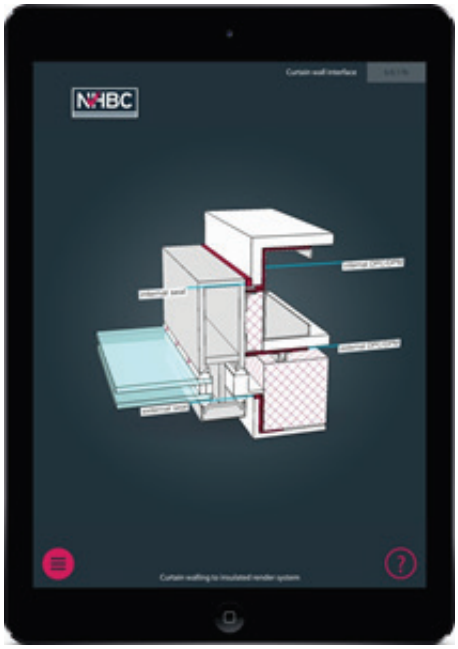
In September, mailing of the Standards 2016 began, delivering the new-look Standards to NHBC registered builders, Housing Associations and industry professionals nationwide. In conjunction with the distribution of the hard copy, we have made Standards Plus – the online version of the NHBC Standards with a host of added features – freely available to all visitors to our website. Not only that, we are launching the new NHBC 3D Viewer app on iOS and Android devices, bringing interactive 3D models to Standards readers for the first time.

GUIDANCE

Standards Plus has been available to NHBC Portal users for some time, providing readers with a digital edition of the Standards complete with supplementary technical guidance and quick referencing functions. In this time, we've seen a significant rise in the number of individuals accessing Standards Plus, signalling considerable growth in the industry's use of digital technology in day-to-day working. We have also observed an expansion of the mobile device user base, with a steadily increasing number of readers accessing Standards Plus on tablets and smartphones.

NHBC's ambition has always been to support the industry in raising house-building standards and, for almost 80 years, the NHBC Standards document has been key to that aim. In light of this, and the continued success of Standards Plus, we've decided to make Standards Plus free to all visitors to the NHBC website – no registration or login required.
In addition to the distinct changes introduced in the Standards 2016 hard copy edition – discussed in Technical Extra 18 – Standards Plus presents an array of features unique to the digital environment, including the following:

- Added technical content, such as videos and further guidance notes.
- Expanded supporting links to external sites.
- Improved word-search function for quick referencing.
- Enhanced usability features for mobile devices.



Also new to Standards Plus is the arrival of interactive 3D models, which expand upon existing 2D illustrations by launching directly in your web browser.

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GUIDANCE (CONTINUED)

We're also bringing 3D models to readers of the hard copy edition of Standards 2016, with the NHBC 3D Viewer companion app, available for iOS and Android mobile devices via the App Store and Google Play. Each Standards 2016 illustration with an associated 3D model will be accompanied by an icon signalling its availability within the app – users can simply launch the 3D Viewer and select the model they wish to view, referenced by the clauses in which they appear. Unlike Standards Plus, which requires an internet connection for access, the 3D Viewer app can be launched offline once downloaded, meaning readers can access the models wherever they may be.

3D models

For the first time, we have introduced a number of 3D models, which have been developed to illustrate important details more clearly. They can be accessed directly within Standards Plus, the online version of the Standards, by clicking on the embedded icons. We have also developed the new NHBC 3D Viewer app, which hosts a library of the 3D models to view on iOS and Android devices.

Scan Me...

Got a smartphone and QR reader app?

Using your smartphone and QR reader, scan the codes below to jump directly to Standards Plus 2016, or the NHBC 3D Viewer app (via the App Store and Google Play).

Standards Plus 2016

NHBC 3D Viewer app

YOU NEED TO...

- Look out for Standards Plus 2016, free at www.nhbc.co.uk/standardsplus.
- Interact with the new 3D models in Standards Plus 2016.
- Download the NHBC 3D Viewer to your Apple or Android smartphone or tablet.
- Contact Standards and Technical if you have any queries: call us on 01908 747384 or email technical@nhbc.co.uk.

NHBC STANDARDS

Waterproofing of basements and other below ground structures

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

The launch of Standards 2016 brings with it the formal introduction of Chapter 5.4 'Waterproofing of basements and other below ground structures' The Standards, including Chapter 5.4, become effective on 1 January 2016.

To allow house builders and the waterproofing industry time to prepare for the changes, the chapter was published in November 2014, well in advance of it becoming effective. Already, its practical guidance has been adopted by many of NHBC's registered builders, helping to improve their approach to this critical area of construction. In this article, we look at specific points of the new chapter and explain how they should inform your approach to waterproofing.


Waterproofing of basements and other below ground structures

CHAPTER 5.4

This chapter gives guidance on meeting the Technical Requirements for the waterproofing of basements and other structures below, or near to, ground level.

NHBC

Raising Standards. Protecting Homeowners

GUIDANCE

NHBC's Basement Campaign was launched in 2013. Initially analysing data recorded through NHBC's claims activities, the research quantified the number and cost of claims related to basement failures made against the NHBC's Buildmark warranty.

The findings were both surprising and concerning. Between 2005 and 2013, claims relating to basement waterproofing cost in the region of £21 million, affecting 890 homes. Clearly something has been going wrong with this critical element of construction. To address this, NHBC put in place a range of measures to bring about improvement, including the introduction of Chapter 5.4.

Working with industry to develop the content, the new chapter marks a significant change in the way that waterproofing should be considered, including at the design, specification and installation stages. Since the soft launch of the chapter, a few commonly occurring questions have been asked.

How does NHBC define a waterproofing system?

The chapter recognises a range of different types of waterproofing system, along with most of the variations within each type. For example, guidance is given for Type A waterproofing barrier systems, and further recognises that this could be either bonded sheet membrane or a cementitious render system, amongst others.

Overarching guidance for all types of waterproofing system is found in Clause 5.4.6b 'waterproofing systems, materials and components'. This asks for systems, including individual components, to be predefined, and for the system to be assessed in accordance with Technical Requirement R3.

In practice, this will typically require the system manufacturer or supplier to define the components that are critical to their system, such as those used to

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GUIDANCE (CONTINUED)

form joints and junctions. The complete waterproofing system should then be independently assessed and certified to confirm that it will provide satisfactory performance, including its ability to withstand water which could be under pressure. Generic components that can be used with various systems will require certification to confirm compatibility and satisfactory performance specific to the system that it is used with.

What's the difference between a fully bonded barrier and other types of barriers?

Fully bonded Type A barriers are defined within Chapter 5.4 as systems that form a composite with the structural wall, such as liquid-applied and cementitious systems. Adhesive-applied (hot or cold) tanking membranes are not defined as fully bonded. There are two situations in Chapter 5.4 where fully bonded barriers are considered.

Clause 5.4.3b 'risk-based design' provides guidance for where a wall is retaining more than 600mm of ground and a Grade 2 environment is required. In this situation, an adhesive-applied membrane could be difficult or expensive to repair should it fail, and should not be relied upon as the only means of waterproofing.

As detailed in Clause 5.4.7a, only Type A systems that are fully bonded, and have been appropriately assessed, are acceptable for use in internal or 'sandwich' applications.

Where is waterproofing required?

As opposed to damp proofing, which will only prevent the transfer of water vapour, waterproofing should be installed in situations where the transfer of liquid water needs to be prevented through parts of the structure below or near to ground level.

The introduction to the chapter contains a number of diagrams with solid red lines showing a range of situations where waterproofing is always required. In these situations, there is a significant risk of water coming into contact with walls, floors and ceilings. These include full basements (where the ground level is raised on all sides), lift pits and buried podiums.

There are also situations where the risk may be lower. Generally, waterproofing will still be required, but consideration can be given to whether or not the structure is likely to be in contact with water. For example, the chapter requires that consideration is given to providing waterproofing to the floor of a semi-basement (where the floor level is above the adjacent ground on one or more sides).

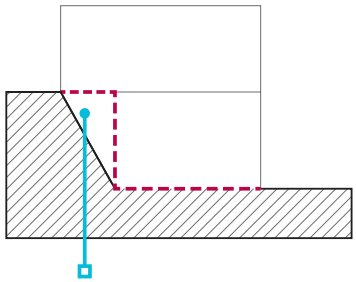
In the specific situations identified in the chapter, where not including waterproofing is considered, it may be possible to demonstrate reasonably that the structure is unlikely to come into contact with water, making it unnecessary.

What does giving 'consideration' mean in practice?

Consideration as to whether waterproofing is required or not should be technically justified and based on a range of factors relating to the site, ground, ground water and building conditions.

The information should form part of the waterproofing design undertaken by the waterproofing design specialist. Only when it can be technically justified that the structure is unlikely to come in to contact with water can the waterproofing be omitted.

By taking this approach, the chapter provides flexibility to consider the risk of water coming into contact with the structure, and therefore whether waterproofing is not needed in a limited number of specific situations.



structures adjacent to voids where water may accumulate

Do steps in floor slabs require waterproofing?

Where the step in a slab is greater than 150mm, waterproofing should be provided to the vertical wall section. Consideration should be given to providing waterproofing to the floor based on the factors given above.

Where a separating wall is retaining more than 600mm of ground and a Grade 3 environment is required, a combined system should be used.

Further examples of construction types generally requiring waterproofing are included in the introduction on page 1 of Chapter 5.4.

GUIDANCE (CONTINUED)

Where do I need to use a combined system?

A combination of two types of waterproofing should be used where a wall retains more than 600mm of ground and a Grade 3 environment is required.

As an alternative approach, and where it has been demonstrated through a detailed hydrological assessment that the ground water is permanently below the floor slab, a Type B structurally integral concrete system can be acceptable on its own.

Do I have to undertake a ground conditions investigation?

For the waterproofing design to be successful, it is important that the ground conditions are understood. The extent of investigation should be appropriate for the construction being waterproofed. NHBC may ask for a ground investigation report where the part of the structure requiring waterproofing is over 600mm, or more than 15% of the building perimeter.

In most cases, information relating to ground conditions can be established from a Basic Investigation in accordance with Chapter 4.1 'Land quality – managing ground conditions' and the further guidance found in Table 1 of Chapter 5.4. Where a risk is identified, a more detailed investigation may be required.

Where the ground water conditions are critical to the waterproofing design, a detailed hydrological assessment, in accordance with the guidance given in Clause 5.4.4, should be undertaken.

Does the waterproofing design specialist have to be CSSW qualified?

Recognising the complex and specialist nature of waterproofing design, one of the key areas of NHBC's approach to managing risk is the requirement for the waterproofing design to be undertaken by an appropriately qualified person.

The Certified Surveyor in Structural Waterproofing (CSSW) qualification is widely recognised by the industry as setting an appropriate benchmark by which designers can demonstrate their competence in this field.

In the vast majority of cases, NHBC would expect the waterproofing design to be undertaken by a CSSW qualified waterproofing design specialist. An exception might be on a specific design, where NHBC has assessed the qualifications of the waterproofing designer and is satisfied that they are at least equivalent to the CSSW qualification.

Are macadam finishes acceptable as waterproofing to basement car park floors?

Following the guidance described in this article, parts of the structure that need to resist water from the ground should be provided with a waterproofing system. Macadam finishes are not considered to be a waterproofing system and, therefore, they are not considered suitable for waterproofing where the basement car park floor is likely to be subject to water from the ground.

Car parks that have openings such as for ventilation or entry/exit should be provided with drainage to deal with any surface water.

YOU NEED TO...

- Be aware of Chapter 5.4 and how it applies to you.
- Ensure that waterproofing systems are suitably assessed.
- Contact NHBC, should you require further advice.

REGULATION AND COMPLIANCE

Sprinklers in Wales

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

In October 2013, the National Assembly for Wales passed new regulations to apply the Domestic Fire Safety (Wales) Measure 2011. The Welsh Government put into operation the first stage of this legislation on 30 April 2014, requiring the installation of fire sprinklers in certain non-domestic residential premises, such as new and converted care homes, children's residential homes, hospices, halls of residence, boarding houses and certain hostels.

The second stage of this legislation comes into force on 1 January 2016, requiring the installation of fire sprinklers in all new houses and flats, including those formed by a material change of use.

This means that Wales will be the first country in the world to require the installation of an automatic fire suppression system in all new houses and flats. The Welsh Government has also been funding a number of fire sprinkler installation projects across Wales, within the social housing sector, prior to the implementation date of January 2016. The project has considered the views of designers, builders, building control bodies and tenants, with the aim of making the systems robust, affordable and as effective as possible. This project is collecting valuable data to assist the Welsh Government in understanding the theoretical and practical application of the legislation.

REQUIREMENTS

The significant change is that sprinklers will be required in all new homes in Wales from 1 January 2016. This requirement is in addition to, and not in lieu of, the existing requirements of Approved Document B (Fire safety).

The sprinkler system design, installation and commissioning will need to follow the recommendations and guidance provided in BS 9251:2014 ('Fire sprinkler systems for domestic and residential occupancies. Code of practice').

The amended versions of Approved Document B (Fire safety) are available at GOV.Wales

For **Building Regulations advice and support**, call **0844 633 1000** and ask for **'Building Control'** or visit **www.nhbc.co.uk/bc**

REQUIREMENTS (CONTINUED)

Points to consider:

- The design, installation and commissioning should be carried out by a competent person.
- Early engagement with the local water authority to establish the anticipated water pressures for the new homes will provide the information necessary to assess whether a mains or storage-based water supply is going to feed the sprinkler system.

Transitional arrangements – sprinklers in Wales

The requirement for sprinklers in houses and flats does not apply to building work which is the subject of an initial, amendment or, building notice, or full plans submission, which is served before 1 January 2016, provided that work is commenced on site before 1 January 2017.

Further information is available at **GOV.Wales**

YOU NEED TO...

- If building in Wales, install fire sprinklers in all new houses and flats, including those formed by a material change of use.
- Ensure any changes to your designs are made to accommodate this, and note the transitional arrangements for their introduction.
- Read the amended versions of Approved Document B (Fire safety), available at GOV.Wales

REGULATION AND COMPLIANCE

Sustainable drainage systems

Who should read this: Technical and construction directors and managers, designers and site managers.

INTRODUCTION

Sustainable drainage systems (SuDS) are required to control surface water run-off from development areas effectively, without connection to the public sewer system. The objectives of any SuDS scheme are threefold: to manage the environmental risks resulting from the quantity of surface water run-off (storm duration or intensity); to manage the environmental risks associated with the quality of surface water run-off (pollutants); and to maximise amenity and biodiversity opportunities.

Appropriately designed, constructed and maintained SuDS are more sustainable than traditional drainage methods, as the intention is to mimic natural catchment processes.

The choice of scheme will be determined chiefly by the anticipated volume of water to be controlled, specific site hazards and ground characteristics. The simplest schemes may achieve this by piping surface water run-off directly to traditional soakaways. More complex schemes will require the use of a variety of SuDS components with the aim of creating a 'management train'; drainage techniques in series that incrementally reduce pollution, flow rates and volumes of run-off.

SuDS components are typically sited at, or below, ground level, but may also include features located on buildings such as 'green' or 'blue' roofs.

REQUIREMENTS

SuDS legislation

In Scotland, the Water Environment and Water Services (Scotland) Act 2003 (WEWS) amended the Sewerage (Scotland) Act 1968, to include a definition of SuDS. The act gives responsibility to Scottish Water for the adoption and maintenance of public SuDS in Scotland. The definition does not include private SuDS that are located entirely within the curtilage of a single property, or SuDS that convey road drainage only. The use of SuDS is obligatory when dealing with surface water drainage from all new developments, and SuDS need to be designed to Scottish Water's specifications given in 'Sewers for Scotland 2nd Edition'.

In Northern Ireland, it is anticipated that SuDS will be included in new developments where practicable, and that Section 163 of the Water and Sewerage Services (Northern Ireland) Order 2006 will be amended to make the right to connect surface water run-off to public sewers conditional upon meeting new standards. It is further anticipated that responsibility for approving SuDS in new developments will rest with the proposed SuDs approval body (SAB), Northern Ireland Environment Agency (NIEA) or Rivers Agency

In England and Wales, the Flood and Water Management Act 2010 (F&WMA) incorporates provision for managing rainwater (including snow and other precipitation) in Schedule 3, 'Sustainable Drainage'. Schedule 3 intended that SuDS would be approved and adopted by a SAB, who would be either the unitary authority, the county council for the area, or a body appointed as approving body for drainage systems by the Welsh Minister for drainage systems in Wales and the Secretary of State for drainage systems in England.

The role of the SAB included giving consideration to an application and, following consultation with relevant bodies, granting approval when satisfied that the drainage system, if constructed as proposed, would comply with national standards published by the Minister. Thereafter, providing that the drainage system was constructed and functioned in accordance

REQUIREMENTS (CONTINUED)

with the approval proposals, the SAB would have been required to adopt the drainage system.

Both the Department for Communities and Local Government (DCLG) and the Welsh Government have recently engaged in separate consultation with a wide range of partners over implementation of Schedule 3 of F&WMA 2010 in their respective areas.

The Welsh Government issued 'Interim non-statutory standards for sustainable drainage (SuDS) in Wales – designing, constructing, operating and maintaining surface water drainage systems for consultation'. The consultation period ran from 12 February 2015 to 30 April 2015 and, at the time of writing, the outcome of the consultation is anticipated shortly. If accepted, the Welsh Government proposes to publish the non-statutory guidance on an advisory basis prior to the commencement of Schedule 3, at which time the non-statutory guidance is expected to form the basis for future national standards.

The DCLG and Defra engaged jointly in consultation on an alternative approach to delivering effective SuDS in England from that envisaged by Schedule 3 of the F&WMA 2010, following concerns raised by councils and house builders regarding the consenting regime for SuDS being separate from the planning system. The consultation period ran from 12 September 2014 to 24 October 2014, and proposed making better use of the planning system to secure SuDS. Four key areas for discussion were set out:

- Whether the planning system would deliver SuDS.
- Local planning authorities' ability to obtain appropriate expert advice.
- Appropriate thresholds for the proposed policy.
- Maintenance of SuDS.

The outcome of the consultation was delivered on 18 December 2014 as noted below.

Recent changes in the approach to delivering effective SuDS in England

Following consideration of the responses to the consultation, on 18 December 2014, the Secretary of State for Communities and Local Government announced a change of national planning policy in relation to SuDS. The changes in the approach to delivering SuDS in England were given in a written ministerial statement, which confirmed that it is the Government's expectation that SuDS will be provided in new developments wherever appropriate. A subsequent consultation considered further changes to statutory consultee arrangements for the planning application process.

The changes resulting from both consultation exercises took effect on 6 April 2015 and included:

- Making local planning authorities responsible for securing delivery of SuDS through the planning system, whereby they must satisfy themselves that the proposed minimum standards of operation are appropriate and that the sustainable drainage system is designed to ensure that the maintenance and operation requirements are economically proportionate. The decision on whether a sustainable drainage system would be inappropriate in a specific development situation will be a matter of judgement for the local planning authority. To support local authorities in implementing the changes, the DCLG published revised planning guidance and also engaged with local government on a capacity-building programme to enable adequate resourcing.
- Requiring local planning authorities to obtain technical expertise from statutory consultees during the planning application stage. Lead local flood authorities have been introduced as statutory consultees for surface water management, and the statutory consultee role of the Environment Agency has been altered to achieve a more proportionate approach in light of the changing responsibilities [the foregoing changes have been made by amendments to the Town and Country Planning (Development Management Procedure) (England) Order 2010]. In addition, other bodies such as highway authorities, internal drainage boards, the Canal and River Trust, and local water and sewerage companies may be consulted on a non-statutory basis and through local arrangements, when appropriate.
- Applying the policy to all developments of 10 homes or more and to major commercial developments unless demonstrated to be inappropriate.
- Requiring local planning authorities to ensure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for ongoing effective maintenance of the SuDS over the lifetime of the development.

In March 2015, Defra published non-statutory technical standards for SuDS to be used in conjunction with the National Planning Policy Framework and revised Planning Practice Guidance.

REQUIREMENTS (CONTINUED)

Potential impact on development

Drainage systems for surface water need to be considered at the earliest stages of planning considerations, as integrating SuDS schemes into developments may influence other aspects of the site design, layout and function.

Designs need to consider local planning authorities' policy documents and take due account of the local flood risk management strategy and other associated documents.

Successful designs will meet the three principal objectives of managing the environmental risks resulting from the quantity and quality of surface water run-off (potential for flood and pollution), whilst maximising amenity and biodiversity opportunities to benefit the development.

Design considerations in the use of attenuation and infiltration systems – issues to be aware of:

- Use of attenuation or infiltration components in close proximity to foundations may result in undermining foundations, loss of support to sides of foundations and/or water infiltration causing softening of the soils supporting foundations and infrastructures. Locate attenuation and infiltration components at a suitable distance from susceptible foundations and infrastructures.
- Size and location of infiltration components need to be carefully considered, with due regard to the drainage potential and possible instability of the ground.
- Design of surface water infiltration is to make due allowance for the protection of ground water quality.

Table 1 – Summary of current position around the UK

	England	Scotland	Wales	Northern Ireland
Current status	F&WMA 2010, Schedule 3 not fully implemented	Implemented	Currently no change to existing arrangements for surface water drainage	Currently no change to existing arrangements for surface water drainage
Legislation	F&WMA 2010, Schedule 3, amended by written ministerial statement dated 18 December 2014, and subsequent changes to statutory consultee arrangements	WEWS (Scotland) Act 2013, Sewerage (Scotland) Act 1968	F&WMA 2010 Schedule 3, not implemented pending results of consultation exercise, anticipated late autumn 2015; implementation likely to be by interim non-statutory standards	Water and Sewerage Services (Northern Ireland) Order 2006; implementation anticipated via amendment to Section 163
Supporting documents/ standards	Currently non-statutory, technical standards to be used in conjunction with National Planning Policy Framework and revised Planning Practice Guidance	Sewers for Scotland 2nd Edition	Anticipate interim non-statutory standards for SuDS in Wales to be published on an advisory basis, pending result of consultation exercise and publication of national standards	
Approval	Currently non-statutory, implementation is via planning process with technical expertise obtained from statutory consultees	Scottish Water for public SuDS (excluding those that convey road drainage only)	To be confirmed	To be confirmed, but currently approval is anticipated to be via the proposed SAB, Northern Ireland Environment Agency (NIEA) or Rivers Agency

REQUIREMENTS (CONTINUED)

Table 1 continued – Summary of current position around the UK

	England	Scotland	Wales	Northern Ireland
Adoption	To be established via planning process	Scottish Water for public SuDS (excluding those that convey road drainage only)	To be confirmed	To be confirmed
Maintenance	To be established via planning process	Scottish Water for public SuDS (excluding those that convey road drainage only)	To be confirmed	To be confirmed

YOU NEED TO...

- Consider surface water drainage systems at the earliest stages of planning submission, consider local planning authorities' policy documents and take due account of the local flood risk management strategy and other associated documents.
- Make sure the SuDS scheme design meets the three principal objectives of managing the environmental risks resulting from the quantity and quality of surface water run-off (potential for flood and pollution) and maximising amenity and biodiversity opportunities.
- Ensure that effective long-term maintenance arrangements for SuDS schemes are in place.
- Locate attenuation and infiltration components at a suitable distance from susceptible foundations and infrastructures to prevent loss of effective support.
- Design infiltration components with due regard for potential local flooding and ground instability.
- Design surface water infiltration systems giving due consideration to the protection of ground water quality.
- Where 'green' or 'blue' roofs are incorporated in the design, ensure that an effective waterproofing system is applied to the roof.

REGULATION AND COMPLIANCE

Changes to BS 7671 – Consumer units

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

Following reported fires within consumer units, burning through moulded thermoplastic enclosures, Amendment 3 to BS 7671:2008 (IET Wiring Regulations Seventeenth Edition) introduced a new regulation requiring consumer units and similar switchgear assemblies, in domestic premises, to have non-combustible enclosures.

REQUIREMENTS

The introduction of Amendment 3 to BS 7671:2008 from the 1 January 2015 included several new and amended regulations which came into effect on 1 July 2015. It also stated that electrical installations designed after 30 June 2015 would need to comply with the Amendment 3 requirements. One particular regulation 421.1.201 related to the selection of consumer units in domestic (household) premises and states:

421.1.201 Within domestic (household) premises, consumer units and similar switchgear assemblies shall comply with BS EN 61439-3 and shall:

- have their enclosure manufactured from non-combustible material, or
- be enclosed in a cabinet or enclosure constructed of non-combustible material and complying with Regulation 132.12.

Note 1: Ferrous metal, e.g. steel, is deemed to be an example of a non-combustible material.

Note 2: The implementation date for this regulation is 1 January 2016. This does not preclude compliance with this regulation prior to that date.

To allow time for this change to be made the implementation date for this regulation was extended to 1 January 2016 and electricians have been made aware of this through various promotional campaigns by their electrical trade bodies.

Metal consumer units will probably become the norm but plastic consumer units can still be used provided they are housed within an enclosure/cabinet constructed of non-combustible material including the base, cover, door and any components such as hinges, screws and catches. The outer enclosure/cabinet should be large enough for the initial installation of the consumer unit and subsequent operation, inspection, testing and replacement of components etc.

Questions have been raised as to whether it is necessary to use cable glands made from metal or intumescent sealing material for cable entries. Testing carried out on metal-cased consumer units has shown that aside from normal good working practices, such as minimising the size of cable entry, no special glands or fire stopping of cable entries is required, although the installation should follow any consumer unit manufacturer's instructions where provided.

YOU NEED TO...

Properties offered for a Pre Handover inspection after 1 January 2016, which have combustible consumer units that are not enclosed within non-combustible enclosures, will require:

- The usual electrical completion certificate
- Confirmation, on the builder's letter headed paper, that the design was completed before the 1 July 2015 and is in compliance with BS 7671: 2008 incorporating Amendment 2.

For **Building Regulations advice and support**, call **0844 633 1000** and ask for **'Building Control'** or visit **www.nhbc.co.uk/bc**

GUIDANCE AND GOOD PRACTICE

Avoiding common fire safety issues

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

Whilst inspecting homes during construction, undertaking surveys of ongoing sites or investigating claims, NHBC has been able to identify a number of important areas of focus related for safety.

Our review shows that, since 2011, half of those claims relating to warranty cover for Building Regulation non-compliance have been related to fire safety. This review has identified four principal areas where improvements can be made:

- Cavity barriers and firestopping.
- Firestopping of service penetrations.
- The use of intumescent collars and wraps to service penetrations.
- Self-closing fire doors.

The guidance discussed in this article focuses on the above, drawing on examples of interventions made during construction.

GUIDANCE

Cavity barriers and firestopping

Cavity barriers restrict the spread of smoke and flames through concealed cavities.

The position and materials forming cavity barriers should be in accordance with the relevant Building Regulations and detailed in the design. We recommend the use of tested and approved proprietary cavity barriers fitted in accordance with the manufacturer's recommendations and used within the limits of the stated field of application of the product. In typical housing of traditional construction, cavity barriers are likely to be required around openings (i.e. windows and doors), as well as the junction between the roof and external cavity walls with a compartment wall that separates buildings. This is a critical location, and areas of focus are likely to include closing the cavity at the eaves of the external wall; provision of cavity barriers in boxed eaves; and the detailing of protection to the roof, such as firestopping below the underlay and between battens above the underlay. For further specific guidance, see Approved Document (AD) B1 or BS 9991:2011.

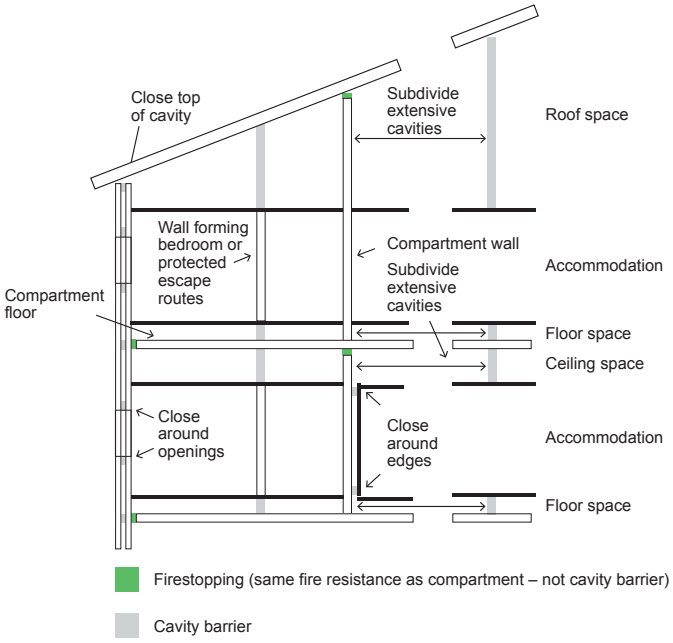
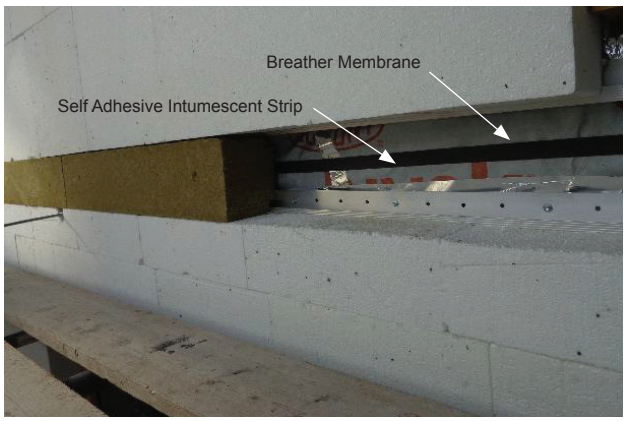


Figure 1 shows the provision of cavity barriers for flats as outlined in AD B2.

For **technical advice and support**, call **01908 747384** or visit **www.nhbc.co.uk**

GUIDANCE (CONTINUED)

The workmanship involved in the installation of cavity barriers has the greatest impact on their performance in the event of a fire.



Incorrect installation of cavity barrier

In this example, it was found that the cavity strip barrier had been simply stuck to the breather membrane.

Discussions with the manufacturer identified that the strip should be mechanically fixed at approximately 300mm centres. For cavities over 70mm, brackets should also be used for extra support.

Firestops should be installed in positions detailed in the design and Building Regulations, and only those materials specified in the design should be used for firestopping. If details of firestop design, location and materials are not available, they should be verified with the designer before construction commences.

Firestopping to service penetrations

All service penetrations through fire-resisting walls, floors and partitions should be adequately firestopped. When the firestopping has been installed, there should be no holes or gaps for smoke to penetrate.

Many builders use propriety fire-sealing products. Where a proprietary system such as an intumescent seal is used, it should be installed in accordance with the manufacturer's instructions and shown by test to maintain the fire resistance of the wall or floor.

Inadequate firestopping

Industry best practice is for firestopping to be provided by a specialist company complete with appropriate labelling (e.g. BS EN 1366-3: 2004, BS EN 1366-4: 2006 and BS476-20:1987), and is the best method of ensuring satisfactory fire resistance and separation. A satisfactory level of protection may also be achieved by suitable fireresisting materials, such as fire resisting foams and mastics or tightly packed rock mineral fibre quilt, fixed in accordance with the manufacturer's instructions.

The use of intumescent collars and wraps for service penetrations

Where service pipes penetrate a fire-resisting wall or floor, the most common method of maintaining the fire separation is to fit intumescent collars or wraps. Collars should be fitted in accordance with the manufacturer's instructions, be sited to finish flush with the wall or floor they penetrate and securely fastened to the structure by means of fire-resistant fixings, with any gaps suitably sealed.

Where wraps are used, they should be set within the surrounding construction to ensure that, when they activate in a fire situation, they crush the pipework and do not expand outwards. Therefore, this type of intumescent protection must be concreted into the floor structure, to ensure that it maintains the degree of fire separation required.

GUIDANCE (CONTINUED)

Picture shows an intumescent wrap correctly fitted and awaiting concreting in

Self-closing fire doors

Fire-resisting doors and positive self-closing devices should be fitted where required by Building Regulations. For example:

- All fire doors should be fitted with a self-closing device, except for fire doors to cupboards and to service ducts (which are normally kept locked) and fire doors within flats. (Note: self-closing devices are necessary on flat entrance doors).
- A common corridor that connects two or more storey exits should be subdivided by a self-closing fire door.
- Every corridor more than 12m long which connects two or more storey exits should be subdivided by self-closing fire doors.

For further guidance, see Approved Documents B1 and/or B2, BS 9991:2011 or contact a suitably qualified Fire Engineer.

Other examples

Further examples of the type of issues identified during inspections over recent months:

- Inadequate fire protection to exposed steelwork within basement car park to four-storey block of flats.
- Fire-rated ceiling not provided.
- During a preplaster inspection, it was identified that a terrace of 10 plots had no cavity fire socks in place.
- Whilst inspecting the conversion of an office block into flats, it was identified that no compartmentation had been provided between homes.
- Inadequate firestopping at the roof junction with separating walls of a terraced house.
- Investigations into how firestopping had been omitted revealed that the two contractors involved both believed it to be the other's responsibility.

YOU NEED TO...

- Ensure that the design details the position and materials for cavity barriers and firestopping in accordance with Building Regulations.
- Only use tested and approved materials fitted in accordance with manufacturer's recommendations and used within the limits of the stated field of application of the product.
- Supply fire-resisting doors and positive self-closing devices in accordance with Building Regulations.
- Maintain a high standard of workmanship and, if necessary, instruct contractors from approved bodies, ensuring appropriate supervision at key stages to guarantee that cavity barriers and firestopping is being installed correctly and not compromised by follow-on trades.
- Ensure responsibilities for firestopping are defined and understood by all involved, especially where responsibility could potentially lie with multiple parties.
- Ensure an adequate fire safety strategy is established and followed in conversions, which present unique challenges.
- Ensure adequate protection is provided for steelwork.

GUIDANCE AND GOOD PRACTICE

Heat Networks: Code of Practice for the UK

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

This article introduces the new Code of Practice (CP1) for Heat Networks, which is intended to raise standards and create greater confidence in their use.

GUIDANCE

The code of practice (CoP) was published earlier in the year as a joint project between the Chartered Institution of Building Services Engineers (CIBSE) and the Association for Decentralised Energy (ADE). The CoP has been authored by AECOM, supported by a steering committee composed of experts from across the sector; it was also made available for extensive public consultation.

If, as expected, heat networks form an increasing part of our future low carbon energy infrastructure in the UK, this CoP will certainly help them to be designed, built and operated to benchmark standards, with a view to providing high levels of customer satisfaction. The CoP has been produced to assist in achieving that aim by raising standards across the supply chain and specifically in the following areas:

- Preparation and brief.
- Feasibility.
- Design.
- Construction and installation.
- Commissioning.
- Operation and maintenance.
- Customer expectations and obligations.

The setting of minimum requirements through a CoP, a first for CIBSE, is intended to raise standards and create greater confidence in the use of heat networks. This in turn will help all of those involved in the specification, manufacture and installation of projects, including those involved in the tendering and contracting process.

CIBSE, supported by the Department of Energy & Climate Change (DECC), has also developed a supporting training programme and register for heat network professionals (the CIBSE Heat Networks Consultants Register) to ensure that the skills necessary to implement the code are available across the sector. The CoP, supported by these trained professionals, can provide a step change in the heat network industry. A one-day introductory course on the code and heat networks is available for those procuring or developing schemes; more details are available at **www.cibse.org/training-events**.

The use of heat networks in the UK is seen by many as an important component in the UK's future energy strategy, addressing the following strategic aims:

- Reducing greenhouse gas emissions through the use of a wide range of low carbon and renewable heat sources.
- Improving the security of energy supply by diversifying the energy sources for heating and reducing dependence on fossil fuel imports.
- Offering a supply of heat that is good value and that contributes to reducing fuel poverty.

It is recognised that a major challenge will be for heat networks to deliver a consistently high standard of service to customers already enjoying a good long-term experience with gas-fired boilers. Therefore, it is imperative that a high-quality installation offering satisfactory reliability, acceptable design life, low carbon intensity of heat supplies, with competitive operating costs, is achieved. It is also appreciated that the cost-effectiveness of the heat supply will be dependent on low-cost finance over a long period of time, to enable funders to achieve long-term performance and reliability.

GUIDANCE (CONTINUED)

You can support the CoP by:

- downloading a copy (which is free for CIBSE/ADE members), using it in projects and promoting its use
- providing feedback which can be used to improve the code in future editions, and offering suggestions for other steps that CIBSE and the ADE could take
- making sure appropriate staff operatives attend the training courses and consider joining the Heat Network Consultant Register.

YOU NEED TO...

- Be aware of the CoP, if you are involved in the design, manufacture, installation or operation of heat networks, and consider the information available in it, the adoption of which will certainly help in raising standards for heat supply. Find out more at www.cibse.org/CP1.

GUIDANCE AND GOOD PRACTICE

NHBC Foundation

Who should read this: Technical and construction directors and managers, architects, designers and site managers.

INTRODUCTION

Supporting the industry with high-quality research and practical guidance, all NHBC Foundation reports are available to download free of charge at **www.nhbcfoundation.org.**

Here are summaries of the latest publications.

GUIDANCE

Part L 2014 – where to start (for Wales) NF64 and NF65

House builders and designers who operate in Wales can now benefit from guidance by the NHBC Foundation on how to meet the challenges of Part L. Many in the industry grapple to understand the complexities of Part L at a time when house builders are ever-more focused on achieving energy efficiency. Complying with Part L – Conservation of fuel and power in new dwellings – is one of the most complex challenges faced by the house-building industry.

These guides include detail on the topic of thermal bridging, such as the heat loss which occurs around window openings and at the junctions between building elements. In recognition of the amount of energy that can be wasted through thermal bridging, the guides include good practice details which show clearly the critical features of good design and construction.

Since last year, new Approved Documents for conservation of fuel and power have been in operation in Wales, steping up the level of performance required. For the first time, they differ from the Approved Documents in England.

Aimed at SMEs in particular, these guides will help house builders understand the variety of approaches that can be used to achieve compliance with Part L, as well as the types of floor, wall and roof construction that can be specified.

Both guides can be downloaded from the NHBC Foundation website, www.nhbcfoundation.org:

- **Part L 2014 - where to start: An introduction for house builders and designers - masonry construction - for Wales (NF64).**
- **Part L 2014 - where to start: An introduction for house builders and designers - timber frame construction - for Wales (NF65).**

YOU NEED TO...

- Take a look at www.nhbcfoundation.org/research and utilise the guidance in the design and construction of your new homes.

For **technical advice and support**, call **01908 747384** or visit **www.nhbc.co.uk**

INFORMATION AND SUPPORT

BFT 2016 - DATES FOR YOUR DIARY

Date	Region	Venue
Thursday 25th February	Southern	Shendish Manor, Hemel Hempstead
Tuesday 1st March	South West	Leigh Court, Bristol
Tuesday 8th March	Scotland	Westerwood Hotel, Cumbernauld
Thursday 10th March	North West	Thistle Haydock Hotel, Haydock
Tuesday 15th March	North East	York Racecourse, York
Thursday 17th March	South East	Sandown Racecourse, Esher
Tuesday 22nd March	East	Cambridge Belfry, Cambourne
Tuesday 5th April	West	National Motorcycle Museum, Birmingham
Thursday 7th April	Northern Ireland	Hilton Templepatrick, Belfast

Further information including details of how to book will be available at **www.NHBC.co.uk**

10 YEARS OF LAND QUALITY ENDORSEMENT

This year our Land Quality Endorsement (LQE) consultancy service, which was established to provide guidance and support to land owners and developers reclaiming or remediating land for residential development, celebrates its 10th anniversary.

During the past decade, our dedicated team of geo-environmental and geotechnical engineers have assessed some of the most contaminated sites in the UK, contributing to the restoration of over 100 sites, with the potential for 45,000 new homes, back to sustainable residential usage.

To discuss any requirements you may have, please contact **LQE@nhbc.co.uk** or call 0844 633 1000 and ask for LQE.

DEFECTS PREVENTION COURSE

This three-day training course (plus prelearning package) covers the requirements of the NHBC Standards and construction best practice for all major areas of home building.

Suitable for site managers, assistant site managers, clerks of works and inspectors, this course is available on an open or in-company basis.

To book, and for further information, visit **www.nhbc.co.uk/training**.

Location	Date
Milton Keynes	26 January; 2, 16 February 2016
Milton Keynes	8, 15, 22 March 2016
Warrington	9, 16, 23 March 2016

STANDARDS PLUS AND 3D MODELS

3D models

For the first time, we have introduced a number of 3D models in the Standards, to illustrate important details more clearly. They can be accessed directly within Standards Plus, the online version of the Standards, by clicking on the embedded icons. We have also developed the new NHBC 3D Viewer app, which hosts a library of the 3D models and is available on iOS and Android devices.

Scan Me...

Got a smartphone and QR reader app?

Using your smartphone and QR reader, scan the codes below to jump directly to Standards Plus 2016, or the NHBC 3D Viewer app (via the App Store and Google Play).

Standards Plus 2016

NHBC 3D Viewer app

For **technical advice and support**, call **01908 747384** or visit **www.nhbc.co.uk**

NOTES:

For **technical advice and support**, call **01908 747384** or visit **www.nhbc.co.uk**

NOTES:

Useful contacts for technical information and advice

NHBC technical advice and support

Tel: 01908 747384
Email: technical@nhbc.co.uk
Web: www.nhbc.co.uk/builders/technicaladviceandsupport

Technical Extra

Previous editions of *Technical Extra* are available on our website at www.nhbc.co.uk/Builders/ProductsandServices/TechnicalExtra/

NHBC Standards

Buy online at: www.nhbc.co.uk/nhbcshop/technicalstandards or access *Standards Plus* on the NHBC website at www.nhbc.co.uk/StandardsPlus

Using your smartphone and QR reader, you can also scan the codes below to jump directly to Standards Plus 2016, or the NHBC 3D Viewer app (via the App Store and Google Play).

Standards Plus 2016

NHBC 3D Viewer app

Building Regulations

For guidance on issues relating to Building Regulations, please visit NHBC's TechZone at www.nhbc.co.uk/techzone

Building Control

For Building Control queries, please call 0844 633 1000 and ask for **'Building Control'**, or email buildingcontroladmin@nhbc.co.uk.

Engineering queries

For Engineering queries, please call 0844 633 1000 and ask for **'Engineering'**.

NHBC Foundation research

The NHBC Foundation facilitates research and shares relevant guidance and good practice with the house-building industry.

www.nhbcfoundation.org

Training

For information about training, please go to www.nhbc.co.uk/training, call 0844 633 1000 and ask for **'Training'**, or email training@nhbc.co.uk.

The Zero Carbon Hub

The UK Government has set out an ambitious plan for all new homes to be zero carbon from 2016. The Zero Carbon Hub helps you understand the challenges, issues and opportunities involved in developing, building and marketing your low and zero carbon homes.

www.zerocarbonhub.org

NHBC Clicks & Mortar e-newsletter

NHBC regularly distributes information on a range of industry topics, including new products and services, the building industry market, house-building news and house-building statistics. To receive this industry information, please register at:

www.nhbc.co.uk/newsandcomment/registerfore-news

General enquiries

For all other enquiries, including ordering products and services, please call 0844 633 1000, and ask for **'Sales'**.

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