

Technical Extra

July 2015 | Issue 18

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Foreword



Welcome to Technical Extra 18

Recent years have seen welcome growth in the house-building industry. House building figures released by NHBC in May show that more than 40,000 new homes were registered in the UK during the first three months of 2015, an increase of 18% on the same period last year.

Past experience has taught us that at a time of increasing production we need to remain clearly focussed on quality. NHBC is uniquely able to draw on our knowledge of how new homes perform.

The lead article in this edition aims to help industry reduce the number of defects by providing feedback on the type of claims typically seen by NHBC. It is recommended that this high level review is considered in parallel with builders' own experience, and is used to help identify those areas most at risk from claims occurring. The table on page 11 summarises NHBC's experience in terms of number and cost.

This edition also includes an article on combustible claddings on multi-storey buildings. Building regulations require that *'The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building'*. This has particular implications for buildings over 18m in height; this article considers the options available.

Other articles in this edition include updates on the Housing Standards Review and the next edition of NHBC Standards. The 2016 edition of the NHBC Standards will be available later in the autumn and will offer the most complete set of technical information yet, published in a user-friendly, up-to-date format. The Standards will again be issued in hard copy format as well as electronically, as *Standards Plus*; providing links to a wide range of supplementary resources.

In Guidance and support, we focus on Foundation claims. Although relatively low in number they have an extremely high impact, not just in physical costs, but more importantly in terms of a builders reputation. This article includes practical guidance to help build foundations correctly. In other articles we discuss lateral restraint straps and the latest publications from NHBC Foundation and the Zero Carbon Hub.

Mark Jones

Head of House-Building Standards

NHBC STANDARDS

Annual claims feedback



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

INTRODUCTION

Recent years have seen welcome growth in the house-building industry. House building figures released by NHBC in May 2015 show that more than 40,000 new homes were registered in the UK during the first three months of 2015, an increase of 18% on the same period in 2014. However, past experience has taught us that at a time of increasing production we need to remain clearly focussed on quality.

This article aims to help industry reduce the number of defects by providing feedback on the type of claims typically seen by NHBC.

GUIDANCE

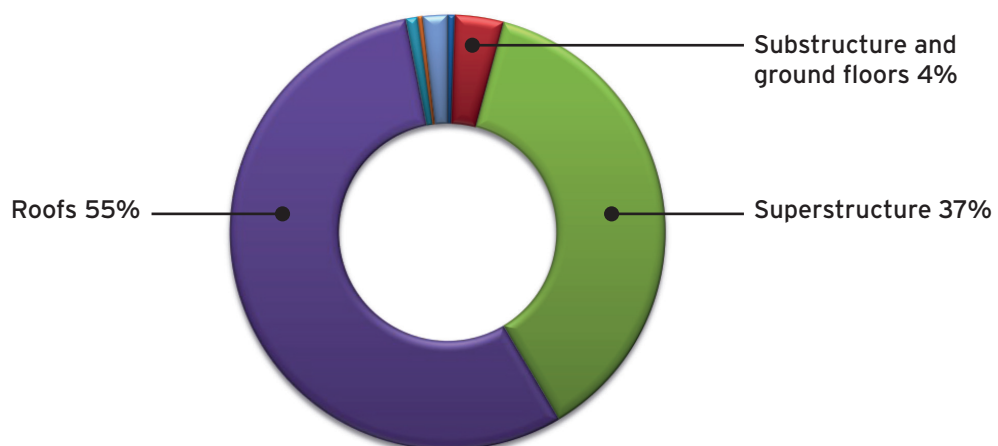
Claims in years 3-10

Claims in 2014 were dominated by a significant storm event in Quarter 1. Claim volumes in this period were almost double the long term average. In order to take a balanced approach to planning and informing NHBC focus in helping builders raise construction quality this article makes an allowance for this event. Commentary below focuses on movement in years 3-10 claims net of the estimated impact of the storm period. Notwithstanding the above, detailed analysis and lessons to be learnt from the type of claim resulting from the storms has been undertaken. The findings will feature prominently in activities aimed at improving performance particularly in relation to

external walls. See the guidance provided on DPCs and cavity trays later in this article, and the free external wall seminars detailed in Information and Support, page 31.

The number of homes subject to year 3-10 claims decreased from c8400 in 2013 to c7100 in 2014. Claims per 1000 plots under cover also decreased in 2014, to c6 valid claims for every 1000 plots under cover in that year, from c7 in 2013.

The chart below shows the number of claims in years 3-10 are still dominated by roof and superstructure issues, with these two areas responsible for over 90% of all claims.



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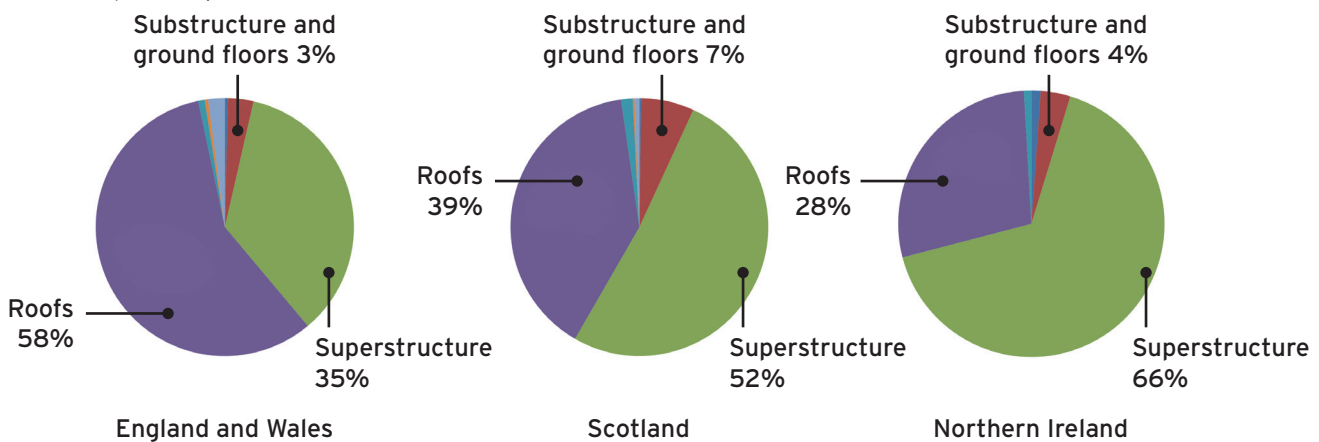


GUIDANCE (CONTINUED)

Roofs

Against a backdrop of a reduction in the overall number of year 3-10 claims, roof claims remain high. In 2014 roof claims represented 55% by number raised (60% in 2013) and 34% by expenditure (26%) of year 3-10 claims for the UK as a whole. However, regional variation is evident; with roof claims in Scotland and Northern Ireland accounting for 39% and 28% of claims by number respectively. In these regions superstructure claims dominate at 52% and 66% respectively.

There continues to be a reduction in the number of pitched roof year 3-10 claims (less than 4,000 in 2014 compared to over 6,000 in 2012). 54% of the 2014 pitched roof claims recorded with damage and cause codes related to mortar issues (down from 61% in 2013).



Roof mortar and dry systems

Failure of roof mortar can be attributed to two common causes: incorrect mortar mix, or mortar bedding and jointing not being completed in one operation.

NHBC has seen a significant move towards dry systems in recent years. The overall number of pitched roof claims, and proportion attributed to mortar failure, has steadily declined during this period.

- Roofing mortar should be 1:3 cement:sand with plasticiser
- The mix should be based on sharp sand with soft sand added to achieve workability
- The proportion of sharp sand should not be less than 1/3 of the total sand content, and mortar bedding and jointing should be completed in one operation.



GUIDANCE (CONTINUED)

Flashings and other weathering details

Flashings and up-stands at abutments were attributed as the root cause in an increasing proportion of pitched roof related claims, accounting for 14% over the past 12 months.

Issues relating to projections through the roof are also increasing, 9% in 2014. They typically occur in three situations; the installation of roof lights, the fitting of dummy chimneys, and the installation of dormer windows.

A review of claims files highlights that GRP dormer windows commonly feature

- GRP dormers should have third-party assessment or a CGMA certification
- Fitting instructions should be available at the time of installation and be followed for all phases of the construction.

Balconies

Balconies represented £5m of expenditure in 2014, a significant increase on the £1.7m costs in 2013. The largest 10 schemes (by cost) accounted for £3.5m of expenditure (£1.0m in 2013).

Many of the issues identified when investigating the cause of the defects can be attributed to deficiencies at either design or construction stage, or a combination of both. They include:

- Inadequate gradient, allowing water to pond.
- Detailing around door thresholds.
- Inadequate drainage.

- Unsatisfactory detailing at laps, junctions and abutments allowing water penetration.
- Incorrect positioning of drainage channels allowing water to pond on membranes.

Remedial works to balconies following water penetration issues can be expensive and disruptive. Rectification might for example require the removal of finishes to the balcony, reinstating membranes with improved laps and waterproofing details around doors, stub walls and parapets and improvements or additions to drainage and/or gutter provisions.

Superstructure

In 2014, superstructure claims in years 3-10 were the 2nd highest issue by number, at 30% for the UK as a whole (31% in 2013), although as highlighted above these were more prominent in Scotland and Northern Ireland. Superstructure claims account for circa 30% by expenditure (33% in 2013).

Three quarters of superstructure defects originated from four areas: DPCs and cavity trays dominate at almost half of all superstructure defects, followed by chimneys, render and the installation of flues.

YOU NEED TO...

- It is clear that a continued focus by the industry on pitched roof coverings is essential. Issues with mortar and dormers specifically, and abutment detailing generally, are apparent in the wider population and represent an increasing proportion of roof claims in recent years.
- Whilst small in number, balcony claims contribute significantly to the overall cost of remedial works. Attention to detail in both design and construction is critical.



GUIDANCE (CONTINUED)

DPCs and cavity trays

The two dominant defects within this section are; failure to install a cavity tray or incorrectly installing the cavity tray. Other issues affecting DPCs and cavity

trays include; missing weep vents, incorrect detailing and the positioning of vertical and horizontal DPCs.

Horizontal cavity trays

NHBC commonly sees simple workmanship issues affecting the performance of horizontal trays. These include the flexible material being too narrow, weep holes being omitted or trays being bedded down onto brickwork, making cutting out for flashings necessary and damage inevitable. When installing horizontal cavity trays above openings and abutments:

1. Ensure horizontal trays are correctly installed above all openings including meter boxes and flues or ducting
2. Weep holes should be provided and spaced at a maximum of 450mm intervals; each opening should have at least two weep holes

3. Cavity trays or combined lintels should have stop ends. Where cavity trays are used, they should extend at least 25mm beyond the outer face of the cavity closer and cover the ends of the lintel
4. At abutments, the cavity tray should be linked to a flashing to prevent water penetrating into the enclosed area
5. Mortar should be raked out whilst still green to allow the flashing to be tucked under the cavity tray by a minimum of 25mm.

Stepped cavity trays

To install a stepped cavity tray correctly, careful consideration should be given to the setting out. For this to be successful, trade collaboration is paramount. When installing stepped cavity trays:

1. It is good practice to use a template, e.g. an appropriate roof truss or frame (with guide lines), to assist with setting out the stepped trays. As a rule of thumb, the back of the tray should be 170-200mm above this truss, it is recommended that a minimum flashing up-stand of 65mm is provided above the top of the finished roof line.
2. To comply with the guidance within NHBC Standards, stepped cavity trays should be pre-formed. If any other method is used, this will need to be agreed with your Inspector together with the method by which you will ensure correct installation

3. The lowest tray should project beyond the eaves line of the roof; there should be a starter tray (stop end at both ends) and a weep hole should be included
4. Each intermediate tray should overlap the previous with the stop end closest to the roof line
5. A ridge tray, with open ends, should be provided at the ridge
6. Mortar should be raked out whilst still green to allow the flashing to be tucked under the cavity tray by a minimum of 25mm
7. Tile selection will dictate the most appropriate flashing detail required at the abutment. Depending on the tile, this could include step flashings with either cover flashings or soakers.



GUIDANCE (CONTINUED)

Render

Render claims typically fall into three categories with de-bonding of the render responsible for almost two thirds of render claims. Investigations found a number of causes for render de-bonding, for example, when the render is applied to a substrate that does not provide a sufficient background for the render to

adhere to, or; the substrate is not suitably prepared to receive the render i.e. not free from dust, dirt, oil etc. The other two prominent areas of render failure include; shrinkage of the render or substrate and the number of coats/thickness of the render.

Chimneys

There were three typical chimney failures resulting in valid claims in 2014; movement of the chimney, water ingress and spalling brickwork. The most common of the three is water ingress. Defects associated with water ingress include; incorrectly positioned/missing

lead trays, incorrect and poorly installed flashing, and the inadequate installation of back gutters. The chimney movement claims observed tend to relate to the movement of dummy chimneys due to inadequate support.

YOU NEED TO...

- NHBC data indicates that the primary issues driving the number and cost of external wall claims are damp penetration caused by inadequate cavity trays and render failures. Ensure those involved in the detailing and installation of cavity trays understand how this should be done correctly.

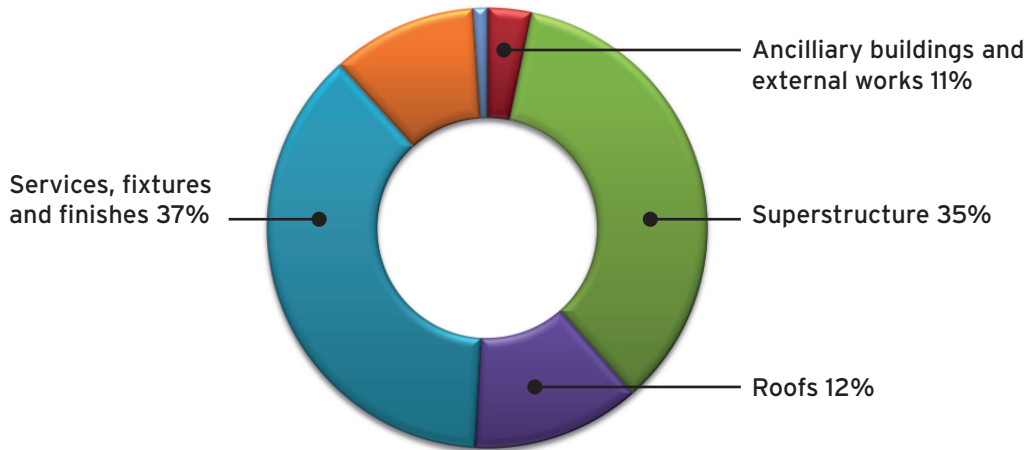


GUIDANCE (CONTINUED)

Claims in years 0-2

Over the past year there has also been a rise in the number of valid 0-2 claims under NHBC's warranty(s). In contrast to the claims we see in years 3-10, claims

within the first two years are led by services, fixtures and finish related defects. Superstructure, similarly to years 3-10 is the second most prominent area for defects, however the types of defect identified within this section differ slightly.



Services, fixtures and finishes

Service, fixtures and finishes claims can generally be divided into five subsections. Internal services were responsible for almost half, followed by; finishings and

fitments, wall and ceiling finishes, floor finishes and painting and decorating.

Internal services

Four categories dominate internal service defects:

Internal services category	Typical issues
Soil and waste systems	Leaking showers, leaking pipework, blocked pipework and odours
Hot and cold water service	Lack of hot water, water hammer and leaking pipework
Electrical service	Sockets not working, faulty lighting and broken sockets and switches
Space heating	Failure to achieve the desired temperatures, leaking radiators and a number of boiler related concerns including a loss of pressure

Technical Extra 11 (September 2013) included a case study on above ground drainage and associated works. This highlighted a number of design and installation issues that culminated in costly and

disruptive remedial works. The case study highlighted the need to ensure that design and construction meet the requirements of relevant Building Regulations and statutory requirements.

YOU NEED TO...

- Ensure services are thoroughly tested and commissioned.
- Internal services are common defects reported in the first two years. Electrical, hot/cold water, soil and waste systems and space heating all appear and raise questions related to testing and commissioning as failure to perform is commonly identified as an area of concern.



GUIDANCE (CONTINUED)

Superstructure

Two thirds of valid superstructure claims related to just five areas in the last year: With the largest contributor being doors and windows, followed by

DPCs and cavity trays, the construction of brick and blockwork, render and the fixing of chipboard flooring. Details of those areas not previously discussed above are included below:

Doors and windows

Door and window claims typically relate to one of three areas: general installation, seals or inadequate fixing. Ironmongery claims generally relate to ironmongery being inadequately fixed, damaged, missing or unsuitable.

Detailed guidance on the design, manufacture and installation of windows was included in Technical Extra 14 (July 2014), and Technical Extra 17 (February 2015) provided further information on ironmongery for doors and windows.



Brick and blockwork

Defects relating to the construction of brick and blockwork tend to be related to two areas: a) the pointing, where mortar is eroding, mortar is

mismatched, or there are mortar spots left on brickwork, or; b) the construction of brick and blockwork being irregular.

YOU NEED TO...

- Ensure fairfaced masonry and mortar is uniform in texture, finish and colour.
- Check facing brick units do not have significant cracks in them or other damage such as chips and marks greater than 15mm in diameter.
- Ensure that windows comply with NHBC requirements, which can be found in Chapter 6.7 'Doors, windows and glazing', and, where multiple windows are coupled together and more than one storey in height, Chapter 6.9 'Curtain walling and cladding'
- When specifying, manufacturing or using ironmongery, ensure that it is correctly fitted and manufactured to the relevant standard.



GUIDANCE (CONTINUED)

Fixing of chipboard flooring

Defects in the fixing of chipboard flooring typically become evident by way of a creaking noise. Inadequate fixing of chipboard flooring generally can be attributed to three root causes: Inadequate

mechanical fixing, a failure to glue joints in tongue and groove boards or unsuitable mechanical fixings. For example the inappropriate use of gun nails to secure chipboard flooring to joists.

YOU NEED TO...

Follow the guidance contained in NHBC Standards Chapter 6.4 S19

- Chipboard should be supported and fixed in accordance with manufacturers' instructions, using either: flat-headed ring shank nails minimum 3mm diameter and of length $2\frac{1}{2}$ times the thickness of the chipboard, or screws, to BS 1210 with a minimum length of twice the board thickness and not less than size no. 8.
- Edges at room perimeters should be supported on joists or noggings.
- Fixings should be spaced at centres not more than 300mm apart along the continuously supported edges and the intermediate supports.
- Expansion gaps should be not less than 10mm wide where boards abut a rigid upstand. For larger areas of boarded floor a wider gap may be needed at upstands and intermediate expansion gaps equal to 2mm per linear metre of floor provided.

For tongued and grooved boards

- Boards should be laid with long edges at right angles to joists.
- Short edges should be supported on joists or noggings.
- To reduce squeaking, tongued and grooved joints between boards should be glued and the boards should be glued to the joists. A suitable polyvinyl acetate (PVAC) adhesive should be used.

For square edged boards and boards with loose tongues

- Boards should be supported on all sides on joists or noggings.



FOCUS AREAS

Focus areas for 2015/16	Frequency	Cost
Nationally, pitched roofs remain the area where NHBC sees most claims in years 3-10 of the buildmark cover. Continued focus in this area will ensure defects continue to reduce, with key areas of focus being: <ul style="list-style-type: none"> a. Ensuring correct specification, mix and/or application of roof mortar b. Attention to detailing around abutments and breaks in the roofs line, for example around dormers, roof lights and chimneys c. Correct installation of dry systems and/or use of compatible components 	□ □ □ □	£££
Defects related to cavity trays dominate external wall claims. Correct detailing and installation is key, with common issues identified being; the tray located in the incorrect position, inadequately jointed and, in the worst cases, omitted completely. This is an important area that may give rise to damage several years after completion, and an area that leads to increased water ingress issues particularly during storm conditions, such as that experienced in January-March 2014.	□ □ □ □	££
Correct application and detailing of render, including specification and preparation of the substrate will also be an area of focus for improvement within the external walls category, with de-bonding an all too common reason for claims being made.	□ □	££
Drainage and Curtain walling and cladding claims are low in number but have contributed significantly to high cost claims.	□	£££
Internal services are common defects reported in the first two years. Electrical, hot/cold water, soil & waste and space heating all appear and raise questions related to testing and commissioning as failure to perform is commonly identified as an area of concern.	□ □ □	£
Claims related to doors and windows appear in the first two years, and are commonly identified as issues relating to either installation or seals.	□ □ □	£
The number and cost of balcony claims have increased significantly in recent years. Attention to waterproof detailing is a critical aspect to successful design and construction.	□	£££
Waterproofing of basements and other below ground structures - although low in number remain high in cost.	□	£££
Specific lessons to be learnt and initiatives resulting from NHBC review of large loss claims as they arise. For example issues relating to Low and Zero Carbon technologies and conversion schemes.	□	£££

NHBC STANDARDS

Standards 2016 - What's New?



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

INTRODUCTION

For nearly 80 years, the NHBC Standards have provided the house-building industry with trusted technical guidance. They have been developed, reviewed and revised, on an ongoing basis ensuring that the technical content, and publication format, keeps pace with innovation and changes in practice.

The new 2016 edition of the Standards maintains this tradition by offering the most complete set of technical information yet, published in a user-friendly, up-to-date format, we believe that the Standards will continue to support you in the delivery of high quality new homes.

GUIDANCE

By working closely with house-builders and industry professionals to develop the content, the NHBC Standards are highly regarded by the industry as a practical, authoritative and accessible source of technical information. Setting clear and balanced technical benchmarks, and providing detailed guidance on how to achieve them, the Standards have always been the cornerstone of NHBC's standard-raising activities.

However, whilst the technical content has been continually updated, the style and format of the NHBC Standards document has not been changed for over 20 years.

In autumn 2015, hard copies of the new edition of the NHBC Standards will be delivered to registered builders, housing associations and industry professionals nationwide. Prior to this, Standards Plus - the online version of the Standards document - will be made freely available to all visitors to the NHBC website. Both versions have undergone extensive design revisions, changing the look and feel of the Standards for the first time in over two decades.

The Standards will become effective for every NHBC Registered home whose foundations are begun on or after the 1st January 2016 and will apply throughout the UK unless otherwise stated.

The revised version of Standards now includes:

- a completely new design
- greater use of technology to deliver technical information

- consolidation of the design, materials and siteworks sections
- shifting to single-column text, making the document easier to navigate, particularly on-line
- removal of content duplication
- more logical sequencing of content
- revision of all illustrations into a consistent and modern style.

You will also notice that Standards 2016 has been written in a clear, concise format, with greater use of bullet point lists, and with related information grouped together in 'tabbed' sections. This is designed to help readers easily access the precise information they need.

Although there will be fewer pages in Standards 2016, it is important to note that, aside from the removal of outdated content and the inclusion of Chapter 5.4 'Waterproofing of basements and other below-ground structures', the technical content remains broadly the same as the current edition.

However, there are a few additions, which provide new guidance for:

- the positioning of wall ties at the top of gable walls
- protective coatings to steelwork
- liquid applied roofing membranes
- fixings for coping stones on gable walls
- ventilation ductwork.

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GUIDANCE (CONTINUED)

In order to bring the chapters into logical build sequence, some of the chapter numbers in the new edition will change. The affected chapter numbers are:

Chapter title	Previous number	New number
The Standards and Technical Requirements	1.1	2.1
Concrete and its reinforcement	2.1	3.1
Cold weather working	1.4	3.2
Timber preservation (natural solid timber)	2.3	3.3
Strip and trench fill foundations	4.4	4.3
Raft, pile, pier and beam foundations	4.5	4.4
Vibratory ground improvement techniques	4.6	4.5
Low or zero carbon technologies	3.1	8.2
Mechanical ventilation with heat recovery	3.2	8.3
A consistent approach to finishes	1.2	9.1
Wall and ceiling finishes	8.2	9.2
Floor finishes	8.3	9.3
Finishes and fitments	8.4	9.4
Painting and decorating	8.5	9.5
Garages	9.1	10.1
Drives, paths and landscaping	9.2	10.2

We trust that you find the new version of NHBC Standards to be easier to use than ever before, and that they build on the success of previous editions.

YOU NEED TO...

- Look out for NHBC Standards 2016.
- Familiarise yourself with the new format.
- Review the updated technical content.
- Contact Standards and Technical if you have any queries, call us on **01908 747384** technical@nhbc.co.uk

REGULATION AND COMPLIANCE

Housing Standards Review



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

INTRODUCTION

On 27 March 2015 the government announced a new approach to the setting of technical housing standards in England. This was accompanied by a significant rationalisation of the large number of codes, standards, rules, regulations and guidance applied by local planning authorities (LPA). This has resulted in the publication of a new set of streamlined national technical standards, incorporated as far as possible within the Building Regulations.

The new standards are - optional building regulations for access and water efficiency, new nationally described space standard (planning standard) and a new mandatory security standard added to building regs (Part Q).

The aim of the review has been to reduce the cost and complexity of the house-building process and to make it easier to build more new homes, whilst also improving quality and continuing to protect requirements for disabled people, the elderly and the environment.

REQUIREMENTS

What's changed?

The most significant change is the introduction of "optional" Building Regulations that local authorities can apply to new housing as planning conditions. The optional requirements can only be applied where there is a local plan policy based on evidenced local need, and where the viability of development is not compromised.

The first of these relates to **new optional access requirements for dwellings** which are included within a revised Part M.

Approved Document M has been divided into two volumes. Volume 1 gives guidance on dwellings and Volume 2 gives guidance on buildings other than dwellings.

There are some changes to the requirements for dwellings (Volume 1):

- Requirement M4(1) (visitable dwellings) is the same as the previous requirement M1 **and still applies to all new dwellings** as the minimum standard.

- Requirement M4(2) (accessible and adaptable dwellings) outlines new optional building regulations for accessible and adaptable mainstream housing to meet the needs of a wider range of older and disabled people (similar to Lifetime Homes).
- Requirement M4(3) (wheelchair user dwellings) outlines new optional building regulations for wheelchair housing (similar to wheelchair housing standards).

M4(2) or M4(3) can only be imposed as a planning condition by the LPA in the grant of planning permission where there is an appropriate policy in the local plan.

There is also a **new optional water efficiency requirement for dwellings**, giving the LPA the ability to impose a limit of 110 (as opposed to 125) litres per person per day for the consumption of wholesome water in areas of water shortage. The revised Approved Document G also includes a new fittings based methodology for calculating water consumption which can be used as an alternative to the water calculator.



REQUIREMENTS (CONTINUED)

The **nationally described space standard** will replace the existing different space standards used by LPA's. It deals with issues such as minimum room sizes, gross internal floor areas and minimum ceiling heights. It has not been incorporated into the Building Regulations and remains solely within the planning system as a new form of technical planning standard that local authorities can choose to use to influence the size of new homes in their local area.

The review also clarified statutory building regulation guidance on **solid waste storage** (Part H6) to ensure it is properly considered in new housing development.

The review has also introduced a new mandatory security requirement for dwellings (Part Q) to protect families from burglary. Part Q is supported by new Approved Document Q, which states that accessible doors and windows must meet PAS 24 Standard.

Application

As previously mentioned, the optional regulations and space standard can only be applied where there is a local plan policy based on evidenced local need and where the viability of development is not compromised. This includes any policy requiring any level of the Code for Sustainable Homes to be achieved by new development; the government has now withdrawn the code (aside from the management of legacy cases).

Changes to the building control system in respect of optional requirements

Optional requirements will be imposed as a condition of the planning permission for the dwelling concerned. The duty to tell a building control body that an optional requirement has been imposed falls on the person carrying out the work.

Where the nationally described space standard has been imposed, checking for compliance and any enforcement action remain the responsibility of the local planning authority.

Transitional arrangements

Part Q comes into effect on 1 October 2015 and applies to all building notices, full plans deposits and initial notices given on or after that date for new dwellings. It does not apply to building notices, full plans deposits or initial notices given before 1 October 2015 so long as the work to which the notices or full plans relate commences before 1 October 2016.

The new optional regulations in Part M and Part G come into force on 1 October 2015 and apply only to building notices, deposit of full plans or initial notices given on or after that date. Any planning condition on security, access or water efficiency imposed where the building notice, full plans deposits or initial notice is given before 1 October 2015, **will be a planning condition and not a building regulations requirement, and will not be enforced by building control bodies.**

The government has published new Approved Documents as well as a range of other guidance documents advising builders, LPA's and building control bodies how the new system will work. The guidance also includes information on how LPA's should treat existing Local Plan policies and legacy developments. Full details of these can be found on GOV.UK

YOU NEED TO...

- Contact your LPA in respect of legacy planning conditions which cover areas other than access or water efficiency.
- Review the new guidance in respect of Access, Water and Security (Parts M, G and Q) in order to update your specifications and liaise with your supply chain.
- A guide to the provision of bin storage is contained in NHBC Foundation report NF60 - Avoiding rubbish design: providing for bin storage on new housing developments.
- For any new sites which will be submitted after 1 October 2015 talk to your NHBC Surveyor to discuss how the changes may affect you.

REGULATION AND COMPLIANCE

Combustible claddings on multi-storey buildings



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

INTRODUCTION

Many options exist for the external wall constructions of tall buildings. Whilst the majority of these pose no risk of fire spread, Regulation B4(1) of The Building Regulations 2010 includes the following requirement:

'The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building'

The key parts of the above requirement are the terms *'adequately resist fire spread over the walls'* and *'having regard to the height of the building'*.

This article considers the implications of this in more detail.

REQUIREMENTS

Fire spread via the external wall medium is exacerbated by the use of combustible materials and extensive cavities. The speed by which a flame rises vertically up the external face of a building leads to potentially rapid fire spread from lower floors to higher ones. Within the confines of a cavity, the flame will also elongate up to ten times its length as it searches for oxygen. Hence, the need for robust cavity barriers, restricted combustibility of key components and the use of materials with a low spread of flame, particularly given the delamination and spalling nature of some of the components when heated.

There have been many instances both at home and abroad where a fire originating at ground level (either internally or externally) has led to rapid vertical fire spread via combustible cladding finishes, insulation materials and other significant items within the wall build-up, aided by the provision of vertical cavities and plentiful supply of combustion air. Section 3 of *BR135 - Fire Performance of External Thermal Insulation for Walls of Multistorey Buildings* goes into great depth to explain the mechanisms of fire spread in these situations. Figures 1 and 2 (reproduced from BR135), shows these in more detail.

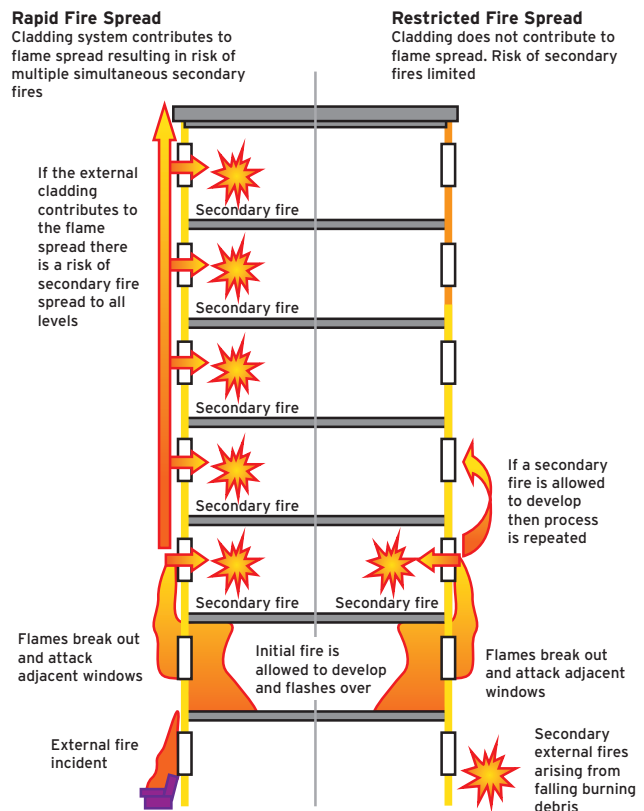


Fig 1: Mechanisms for external fire spread by way of the external cladding system



REQUIREMENTS (CONTINUED)

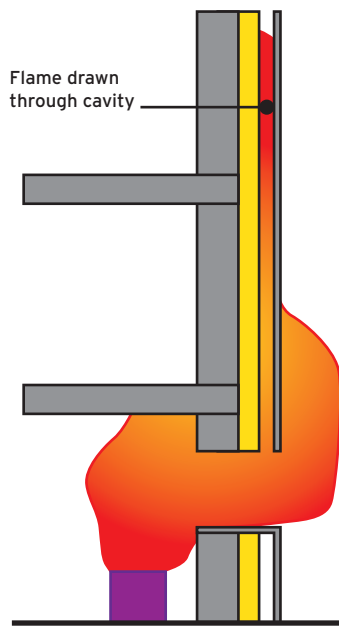


Fig 2: Fire spread through cavities

In addition, Section 12 of Approved Document B2 gives guidance on the acceptable use of combustible materials within the external cladding system and this is outlined below.

Where a building exceeds 18m in height, both BS9991 and Approved Document B2 recommend (for the entire wall area both below and above 18m) either the use of materials of limited combustibility for all key components or to submit evidence that the complete proposed external cladding system has been assessed according to the acceptance criteria in *BR135 - Fire Performance of External Thermal Insulation for Walls of Multistorey Buildings*.

This article outlines both procedures in more detail and addresses common misconceptions relating to combustibility and surface spread of flame ratings.

Statutory guidance addresses these issues for the initial stages of a fire, after which time it is assumed that the fire brigade have arrived to deal with the incident. However, even with the fire brigade's arrival, a fire which cannot be reached within 18m of the street level is unlikely to be adequately tackled using current fire brigade apparatus and so additional safeguards are necessary for taller buildings.

It is also worth noting that a Surface Spread of Flame Classification does not infer any resistance to combustibility, it is solely a measure of the spread of a flame across the surface.

Also, note that:

- Thermosetting insulants (e.g. rigid polyurethane, polyisocyanurate, polystyrene foam boards) do not usually meet the limited combustibility requirements of AD B2 Table A7 and so should not be accepted as meeting AD B2 paragraph 12.7. However, if they are included as part of a cladding system being tested to BR135 & BS8414, the complete assembly may ultimately prove to be acceptable
- The BR135/BS8414 tests include the spread of fire once it has entered the cavity. Hence, the requirements for cavity barriers in accordance with Section 9 of AD B2 are required in all cases including around openings in the façade

Implications Based on Building Height

The Building Control Alliance has published best practice guidance (BCA Guidance note 18) for builders which can be used by them and building control bodies as a benchmark for assessing cladding systems for buildings over 18m.

Where the building doesn't exceed 18m in height, there is no restriction on the combustibility of the components of the cladding system. However, cavity barriers in accordance with Approved Document B Section 9 and Diagram 30 will still be needed.

Where the building exceeds 18m in height, it is considered that there are four suitable options:-

Option 1

The use of materials of limited combustibility (MOLC) for all elements of the cladding system both above and below 18m. This includes the insulation, internal lining board and the external facing material. Smaller gasket parts and similar low-risk items can be excluded from this requirement. The definition of a MOLC is stated in Table A7 of AD B2.

Option 2

An acceptable alternative approach (see AD B2 paragraph 12.5) is for the client to submit evidence that the complete proposed external cladding system has been assessed according to the acceptance criteria in *BR135 - Fire Performance of External Thermal Insulation for Walls of Multistorey Buildings*. The preferred method of demonstrating compliance is via a fire test carried out in accordance with BS8414:1 *Fire performance of external cladding systems - Part 1: Test method for non-loadbearing external cladding systems applied to the face of the building* or BS8414:2 *Fire performance of external cladding systems - Part 2: Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame*.



REQUIREMENTS (CONTINUED)

The test should be carried out by an independent UKAS accredited testing body. The BS8414 tests do not give a PASS/FAIL answer because the data obtained is used by different bodies with different minimum requirements. Hence, for Building Regulation purposes, any test using this method needs to be supported with a Classification Report for the proposed specification confirming that the acceptance criteria of BR135 have been met. These acceptance criteria are listed in Annex A or Annex B of BR135 and include the following:

- **External fire spread** - determined by a 600°C rise in temperature on the external face of the building (measured at a point approximately one storey above the fire floor) for thirty seconds or more during the initial fifteen minutes of the test.
- **Internal fire spread** - determined by a 600°C rise in temperature on the internal face of the building (measured at a point approximately one storey above the fire floor) for thirty seconds or more during the initial fifteen minutes of the test.
- **Mechanical performance** - determined by an assessment of system collapse, spalling, delamination, flaming debris or pool fires.

Option 3

If no actual fire test data exists for a particular system, the client may instead submit a desktop study report from a suitably qualified fire specialist stating whether, in their opinion, BR135 criteria would be met with the proposed system. The report should be supported by test data from a suitable independent UKAS accredited testing body (BRE, Chiltern Fire or Warrington Fire) and so this option may not be of benefit if the products have not already been tested in multiple situations/arrangements. The report should also specifically reference the tests which have been carried out on the product.

Option 4

If none of the above options are suitable, the builder may consider a holistic fire engineered approach for the entire building. Approved Document B - Volume 2 recognises that fire safety engineering is an acceptable alternative approach to fire safety and cites the British Standard BS 7974, Fire safety engineering in buildings suite of documents as a suitable framework on which to base the design and assessment of all fire safety measures in buildings.

In respect of NHBC Standards, Technical Requirement R1 requires compliance with Building Regulations and other Statutory Requirements relating to the completed construction work.

In addition, clause D8 (c) of Chapter 6.9 'Curtain walling and cladding' of the NHBC Standards advises that reference should be made to BR135.

An acceptable method of demonstrating compliance for Warranty and Building Control purposes is by providing evidence in accordance with BCA Guidance Note 18 - 'Use of Combustible Cladding Materials on Buildings Exceeding 18m in Height' or, in the case of curtain walling, details of the fire testing of curtain walling systems can be found in the relevant CEN harmonised product standard for these systems, BS EN 13830:2003 Curtain walling - Product Standard.

YOU NEED TO...

- Ensure external walls, including cladding, are designed to adequately resist the spread of fire over the walls and from one building to another
- Designs should take account of the height, use and position of the building
- To discuss your proposals please talk to your NHBC Surveyor.

GUIDANCE AND GOOD PRACTICE

Provision of lateral restraint straps for low rise residential buildings



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

INTRODUCTION

Buildings are required to be stable under imposed and wind loading conditions and allowable construction deviations. The elements that provide stability for low-rise residential buildings of traditional construction include foundations, walls, floors and roofs. It is essential that these elements are robustly connected together so as to effectively transfer the vertical and horizontal loads between elements providing support and restraint. Lateral restraint straps may be used to transfer horizontal forces from supported to supporting elements of construction.

GUIDANCE

Standards Chapter - Chapter 6.4

Lateral restraint strapping of masonry walls to floors and roofs should either follow the statutory guidance given in Approved Document A (AD A) or else be engineer-designed in accordance with the requirements of applicable British Standards. Consideration is to be given to maximum lengths of unbuttressed walls, wall thicknesses, and transfer of lateral forces from supported walls to buttressing elements and disproportionate collapse requirements for effective anchorage or tying, as appropriate.

The prime functions of lateral restraint strapping are:

- (a) to restrict the movement of a wall at right angles to the plane of the wall, so preventing it from buckling,
- (b) to transmit horizontal loads, such as wind loads, from walls into floors or roofs and
- (c) to transmit the horizontal loads from floors and roofs into buttressing walls

The latter function is occasionally not given full consideration, but if lateral restraint straps are omitted when they are not required to fulfil the functions of (a) and (b) above, some other method of providing the necessary shear anchorage to effect the transfer of horizontal loads implied at (c) may need to be incorporated.

In addition, lateral restraint straps may be required to provide effective anchorage or tying of suspended floors to walls in order to satisfy the provisions of Section 5 of AD A (disproportionate collapse requirements) for Class 2a buildings.

Compliance with AD A requires the application of all the recommendations, but for provision of lateral restraint straps in particular, attention should be paid to:

- Section 2A - Basic requirements for stability,
- Section 2C - Thickness of walls in certain small buildings and
- Section 5 - Reducing the sensitivity of the building to disproportionate collapse in the event of an accident.

The issue is also covered in BS 8103-1 Structural design of low-rise buildings, Section 4, which states: *'In order to provide overall stability to the structure in any likely loading condition, it is essential that the foundations, walls, floors and roof are properly joined together.*

The connections between structural elements described in 4.4 should be used as necessary to ensure that the elements of the box interact fully in order to transfer and share loads placed on one element with other elements.



GUIDANCE (CONTINUED)

It is particularly important to ensure that wind loads are transferred to buttress walls, piers and chimneys.'

In consideration of the foregoing therefore, unless proven otherwise by calculation, lateral restraint straps should be provided at centres not exceeding 2m (but may be required at centres closer than 2.0m

depending on the area of the country, number of storeys in the building and location of openings in floors and roofs causing interruption in the continuity of lateral support) and in accordance with the guidance contained within AD A and NHBC Standards Chapter 6.4 or relevant British Standards.

Relevant clauses from Building Regulations Approved Document A

Specific to the need to provide lateral restraint strapping between supported walls, buttressing walls and floor and roof constructions forming horizontal diaphragms are the clauses, tables and diagrams listed below.

Reference	Description
Clause 2.3	Definitions (buttressing wall)
Clause 2A2 (a), (b) & (d)	Basic requirements for stability
Clause 2C2	Wall types
Clause 2C3	Use of Section 2C
Clause 2C5	Thickness of walls
Clause 2C9 & 2C10	Thicknesses of walls providing vertical support
Diagram 3	Determination of wall thickness
Table 3	Minimum thickness of external, compartment & separating walls
Clause 2C17	Maximum allowable length and height of wall
Diagram 5	Maximum floor areas enclosed by structural walls
Clause 2C18	Rules of measurement for heights of walls and storeys
Diagram 8	Storey and wall heights
Clause 2C25	Vertical lateral restraint to walls
Clause 2C26	Thickness of buttressing walls
Diagram 12	Openings in buttressing walls



GUIDANCE (CONTINUED)

Reference	Description
Clause 2C27	Design of piers and chimneys providing restraint
Clauses 2C32, 2C33, 2C34, 2C35 & 2C36	Lateral support by roofs and floors
Diagram 13	Buttressing
Table 9	Lateral support for walls
Diagrams 15 & 16	Lateral support by floors and roofs
Clause 2C37	Interruption of lateral support
Clause 5.1	Disproportionate collapse requirements according to consequence class of building

YOU NEED TO...

- Consider each requirement for lateral restraint straps carefully, they may be required to perform several functions, not just tensile strapping (lateral restraint) of walls to floors/roofs.
- Consider stability of low-rise residential buildings under imposed and wind loading conditions and allowable construction deviations.
- Identify the elements of construction providing stability to the building.
- Ensure that elements are robustly connected together so that supported members are restrained and all vertical and horizontal loads are effectively transferred between supported and supporting elements, in accordance with NHBC Standards Chapter 6.4, AD A and British Standards, as appropriate.

GUIDANCE AND GOOD PRACTICE

Foundation defects under the spotlight



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

INTRODUCTION

Foundation claims are relatively low in volume but have an extremely high impact, not just in physical costs, but more importantly in terms of a builders reputation. Given the magnitude of damage and distress to homeowners, it is no surprise that foundation failures gain unwanted press. Foundations are a structural part of all residential buildings and are critical to the overall performance; an area that should not be over looked.

GUIDANCE

Foundation defect statistics are improving year on year; in fact properties on cover in 2012 are performing 3 times better (in claims volumes) than properties on cover in 2005. This improvement appears to correlate with risk management changes made by NHBC around 15 years ago. Some of the most significant changes included the re-write of NHBC Standards Chapter 4.2 'Building near trees' in 2002, the introduction of a Foundation Depth Calculator and the Foundation Key Stage Inspections.

Although improvements have been made and Foundation claim volumes are reducing, the overall cost is still significantly high. Between 2005 and 2012 there have been approximately 1555 reported foundation claims with a cost of just over £57m. In fact one reported foundation claim this year has cost £600k. Of the 1555 claims, 1124 claims (72%) at a cost of £35.5m were related to Strip or Trench fill foundations in shrinkable soils near trees. Foundations depths were constructed not in accordance with the design and/or lacked heave precautions resulting in structural problems such as cracking and movement.



Pre-construction aerial photograph

Post-construction aerial photograph

Foundation designs failed to adequately take account of pre-existing trees.

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



GUIDANCE (CONTINUED)

It is difficult to envisage how much influence vegetation can have on soil properties, especially shrinkable soils such as Clay. The roots of all vegetation (shrubs or trees) take moisture from the soil to replenish the water loss from their leaves. In a shrinkable soil this can result in seasonal movement's, shrinkage in dry periods (summer) and swelling in wet periods (winter), or even with large or dense trees a permanent shrinkage for the lifetime of the

vegetation. It is therefore critical that foundations are taken below this zone of influence from vegetation. This zone of influence is likely to extend greater than the root activity itself and is difficult to assess by the naked eye. Claims experience involving larger high water demand trees has shown that this zone can extend over 3.5m deep and provide potential differential soil movements in excess of 150mm over a normal building footprint.



Shrinkage of clay soils due to moisture extraction from adjacent trees, LHS - 150mm reduction in ground level exposing trench blocks & drainage socket, Mid & RHS up to 15mm stepped superstructure cracking

To understand the underlying risks of a site an initial assessment and basic investigation should be carried out in accordance with Chapter 4.1 'Land quality - managing ground conditions'. Where trees have been identified, existing, proposed or removed within

potential shrinkable soil, for foundation purposes further investigations should be carried out by a suitably qualified person to confirm consistency, shrinkability of soils and the zones of influence.



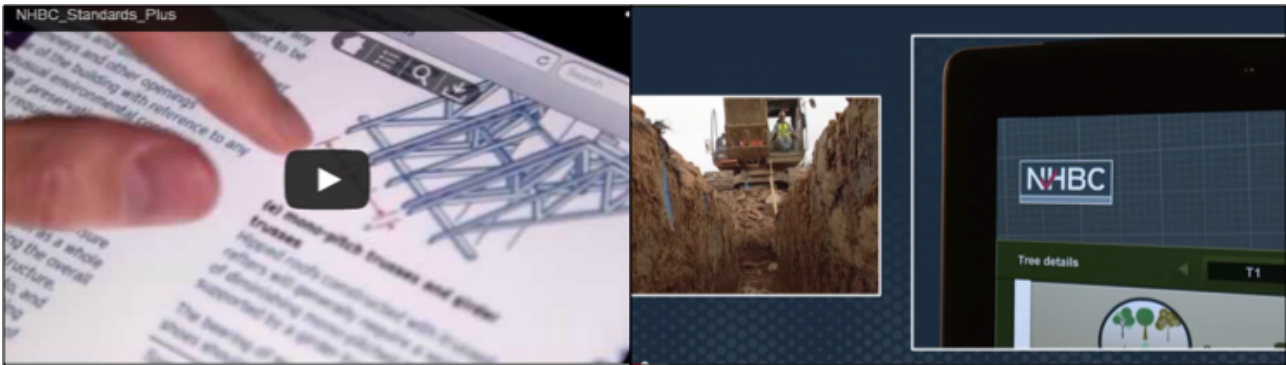
Intrusive investigations - Trial pits in progress to expose foundation formation level



GUIDANCE (CONTINUED)

Chapter 4.2 provides guidance on foundation depths and heave precautions when building near trees in shrinkable soils. However, it is important to note that the depths given are not those at which root activity and ground movement are non-existent, but are of a depth that is intended to provide an acceptable level of risk. To mitigate this risk further, especially when constructing a foundation adjacent to or over a cluster of dense or significant trees, an alternative solution such as piles could be considered.

To help assess foundation depths and heave precautions when building near trees in a shrinkable soil NHBC also provides the Foundation depth calculator. The calculator is available on Windows, Apple and Android operating systems and can be downloaded free of charge.

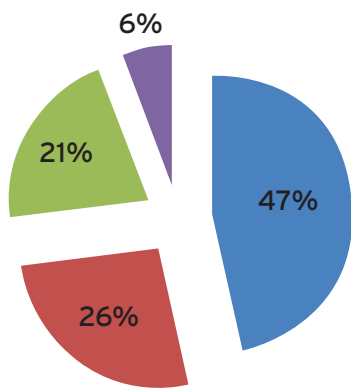


Screen shots - LHS Standards Plus, RHS Foundation Depth Calculator

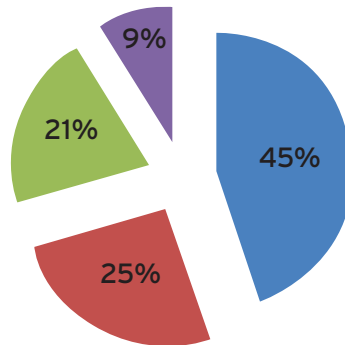
Looking at foundation defects in further detail, on buildings completed 2005-2012, these later generations have cost £7.5m to date and affected 175 homes. Splitting the defects into three main categories: settlement, heave and subsidence;

settlement appeared most common comprising 47% volume at a cost of just over £3.4 million, followed by heave related failures at 26% volume and subsidence at 21% volume.

Volume



Cost



- Settlement
- Heave
- Subsidence
- Unknown



GUIDANCE (CONTINUED)

The largest causation was bearing stratum resulting in settlement related defects, the second largest causation was removal of pre-construction trees resulting in heave related defects. Assessing each defect category individually the following causations appeared most prevalent -

Settlements - Pad, trench, raft and strip foundation types - bearing stratum (poor performing engineered fill and insufficient bearing) and shallow foundations; Piled foundations - Design and varied foundation types. Of the settlement failures 28% at a cost of

£0.5m, related to peripheral parts of a building - a porch, bay window, bike shed, conservatory.

Heave - Trench and Raft foundation types - Removal of pre-construction trees; Piled foundations - Ingress of concrete into ground beam heave precautions.

Subsidence - Trench foundations - Removal of pre-construction and post construction vegetation, (preconstruction being marginally greater than post construction).

SUMMARY

Over the coming months NHBC will be focusing on various foundation related initiatives, some of the high level initiatives include -

- Providing further guidance on Foundation related subjects - Engineered fill, Vibro stone columns, level of Site Investigations, pile designs, heave precautions.
- An accompanying Tree Identification App to the existing popular Foundation Depth Calculator

- A new post construction homeowner landscaping guidance pack

For any general enquires on foundations, please call our technical helpline on **01908 747384** or for site specific enquires please contact your NHBC Engineer site support contact.

YOU NEED TO...

- Complete an initial assessment and basic investigation to determine any hazards in accordance with NHBC Standards Chapter 4.1
- Check past aerial photographs for any removed vegetation, check on www.getmapping.com
- Where hazards exist, such as nearby trees (existing, proposed or removed) in shrinkable soils, carry out further investigations to confirm consistency, shrinkability of soils and the zones of influence
- Check whether you are proposing the correct foundation type for the hazards in question, for trees/shrinkable soils piled foundations may be a viable alternative
- Ensure foundations are suitably designed, and if required include heave precautions and a suspended ground floor
- Ensure foundations are constructed in accordance with the design

GUIDANCE AND GOOD PRACTICE

NHBC Foundation and Zero Carbon Hub publications



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. The Zero Carbon Hub was established in 2008, as a non-profit organisation, for more information on the work of the Zero Carbon Hub visit www.zerocarbonhub.org.

GUIDANCE

Avoiding rubbish design: providing for bin storage on new housing developments (NF60) **www.nhbcfoundation.org/avoidingrubbishdesign**

As the UK increases its recycling of domestic waste, there has been a growth in the number of bins and recycling containers that need to be accommodated. These are often highly visible and scattered across neighbourhoods - creating an eyesore and posing a hazard to residents.

For new homes and housing developments the situation can be different: **Avoiding rubbish design** helps the house-building industry to alleviate 'bin blight' by providing design guidance and best practice examples.

The report begins with a survey of over 300 local authorities to establish what is being asked for in terms of the number or bins, boxes and other containers for the storage of domestic waste and recycling. It finds that the requirements vary widely across the country, with nearly two-thirds of authorities requiring each home to have four or more. At the extreme end of the scale, one authority - Newcastle-under-Lyme in Staffordshire - demands a total of nine!

The guide proposes a range of generic solutions for various types of homes (detached, terraced, apartments, etc.) and includes a variety of case studies from around the country that demonstrate good practice. **Avoiding Rubbish Design** has been referenced in the 2015 edition of Approved Document H (Drainage and waste disposal) to the England Building Regulations.





GUIDANCE (CONTINUED)

A career of choice - attracting talented young people into house building (NF61)

www.nhbcfoundation.org/acareerofchoice

The report **A career of choice** reveals that while a third of boys and young men (37%) are interested in building and construction, only one in ten girls and young women (11%) are interested, the lowest level of interest of any job sector included in the study.

It also finds that the UK house-building industry needs to challenge misconceptions if it is to attract and recruit young people. When asked about house building young people could often identify trade jobs but, apart from architecture, were largely unable to identify professional careers.

The report contains a number of key recommendations, which include:

- The industry should prioritise the promotion of the careers available in house building, explaining the range of practical, technical, managerial and business improvement opportunities.
- To counter the concern that house building may not provide career structures and may be a dead-end choice, the industry should, whenever possible, stress its flexible career paths.
- The industry should encourage the development of new positive narrative on the wider benefits of house building.

Overall it is clear that more work is needed to promote and champion the professional careers in house building, particularly among young women, who are noted to have good levels of interest in technical and design career opportunities.



Homes through the decades: the making of modern housing (NF62)

www.nhbcfoundation.org/homesthroughthedecades

This guide examines the political and social drivers, and technological changes that have shaped the modern home and the way we live. From the gadgets we use to the way our homes are built, the guide contains evocative images and informative charts which illustrate and define key periods in our housing history.

Housing has played a pivotal role in our society and has been at the very top of the political agenda for different reasons at different times over the last century. **Homes through the decades** charts the distinct historical stages in the evolution of the modern home since Victorian times. It explains what drove change and highlights the landmark projects, key events and people who contributed to our diverse housing heritage.

The report also poses questions about what our homes might look like in the future - will demographic changes, such as decreasing family sizes and an ageing population lead to new designs of homes? How much further will sustainability targets be pushed in housing design, and will higher levels of automation become the norm?

It also reminds how people living in newer homes have greater protection because of the introduction of Building Regulations, comprehensive building standards and warranties.





GUIDANCE (CONTINUED)

Sustainable technologies: the experience of housing associations (NF63) www.nhbcfoundation.org/sustainabletechnologies

The housing association sector has been at the forefront in the adoption of sustainable technologies, and this primary research centres on their experiences of the variety of energy-efficient and water saving features. Surveying over 200 housing associations, the research finds that solar PV is the most popular choice, with around three quarters saying they would use PV products again in the future.

The key findings from the research are:

- There is widespread use of sustainable technologies by housing associations
- Code for Sustainable Homes, planning or funding requirements influences technology use
- Cost of the technology influences its installation
- Water efficiency measures are installed four times more often than energy-efficient technologies
- Inadequate installation skills is an issue
- HAs believe that technology use is benefitting residents
- But residents could benefit further with better understanding
- Associations have encountered difficulties in measuring performance and benefits
- Heat pumps are delivering poor levels of satisfaction
- Some infrequently installed technologies have high levels of satisfaction
- The broad use of photovoltaics is likely to continue





GUIDANCE (CONTINUED)

Zero carbon hub builders' book

The Zero Carbon Hub has created an informative guide for SME house builders that promotes good craftsmanship and highlights key construction details when building a new home. Aimed at on site personnel, this new "Builders' Book" will improve quality of the homes by identifying, and recommending solutions to, the most common construction issues which may lead to poor performance, loss of comfort, and increased energy bills in new build homes.

Using real world examples gathered from numerous inspections of multiple buildings sites across the country, the Builders' Book uses simple to understand diagrams, icons and summaries to help builders improve site processes and deliver better performing homes while also reducing a number of potential risks such as mould growth, condensation and excessive heat loss.

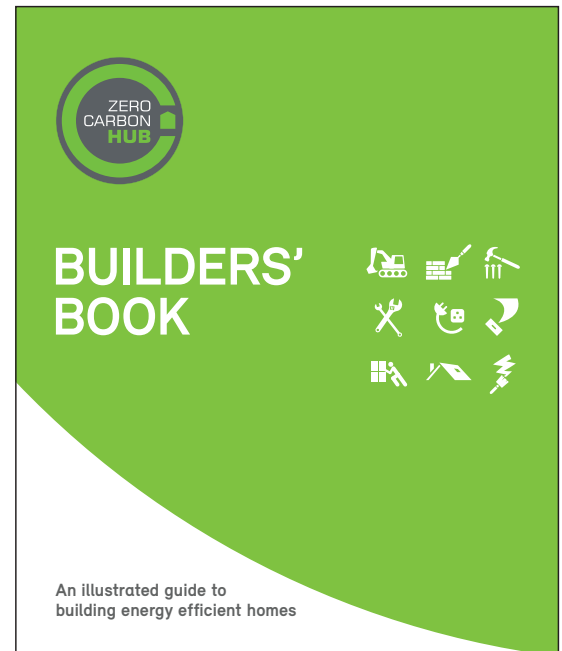
Designed to be used across site by a number of trades the Builders' book also features removable pages for site management, in-house and external training sessions, and trade events. Addressing details from across all build stages, including; foundations and groundworks, cavity walls, window and service installations, and final fix, the Builders' Book outlines each topic with example photographs taken from live development sites, followed by step-by-step guides to instead establish and encourage good practice.

The Zero Carbon Hub hope that by creating this guide they can help bring clarity to the industry on how construction details can impact energy efficient standards of a new home, contribute to the design versus as built Performance Gap, and impact consumer comfort and happiness together with highlighting key areas that require closer attention to improve knowledge and skills.

This initial edition of the Builders' Book is aimed at improving traditional masonry construction of new homes and extensions.

The Builders' Book was launched at the Zero Carbon Hubs event in collaboration with Innovate UK and CITB on the 14 July 2015

Further information about the Builders' Book can be found at www.zerocarbonhub.org



YOU NEED TO...

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

TECHNICAL NEWS

PART L 2014 (WALES) TRANSITIONAL PROVISIONS

Builders who submitted sites to NHBC Building Control ahead of the implementation of Part L 2014 in Wales should note that the final date by which a commencement on site should be recorded is fast approaching.

In order to fully meet the transitional provisions, work on site (as defined) needs to start before 31 July 2015.

Further information is available at www.nhbc.co.uk/Builders/ProductsandServices/BuildingControl/News.



NHBC STANDARDS CHAPTER 4.1 - LAND QUALITY - MANAGING GROUND CONDITIONS' - POTENTIAL RISKS UPDATED

The list of potential risks associated with the development of sites on infill and made ground is being expanded to improve awareness. The following will be included in the new 2016 Standards Chapter 4.1, Table 1.

Potential hazards and associated risks

Potential hazard	Associated risk
Infill and made ground including tipping	Release of gases which may be explosive or asphyxiating
	Low bearing capacity causing excessive total and/or differential settlements
	Consolidation characteristics which may result in subsidence, settlement and/or excessive tilt
	Localised ground variability (laterally and with depth) which may result in subsidence, settlement and/or excessive tilt
	Collapse compression or inundation settlement of non-cohesive fills which may result in subsidence, settlement and/or excessive tilt.

Builders are reminded that where a site* is hazardous, NHBC Rules state that, they must notify NHBC in writing at least 8 weeks before work begins.

*Site is defined in NHBC Rules as an area of land which is covered by a single detailed planning consent.



FREE - EXTERNAL WALLS SEMINARS

The external wall seminars form part of a wider campaign addressing an increasing trend in issues related to external wall.

The seminars are aimed at site managers and will promote a better understanding of the type of defects and how these can be avoided through better design and application of high levels of workmanship and

quality control. The seminars are free but spaces are limited, we recommend that you book as soon as possible to avoid disappointment.

For more information and to book visit www.nhbc.co.uk/externalwalls or contact NHBC events team on **0844 633 1000** and ask for 'event'

DATE	VENUE	DATE	VENUE
8 September	Cambridge Belfry Cambourne	24 September	Thistle Hotel Haydock Park
10 September	Mercure Abbey Hill Hotel Milton Keynes	29 September	York Racecourse York
15 September	National Motorcycle Museum Birmingham	30 September	Westerwood Hotel Cumbernauld
16 September	Leigh Court Bristol	1 October	Hilton Templepatrick Northern Ireland
22 September	Sandown Racecourse Sandown		

CDM ADVISORY SERVICE

Construction Design and Management regulations (CDM) 2015 - the impact on your business and what NHBC is doing to help.

As of 6th April 2015 the new CDM regulations 2015 now places responsibility on the developer or client to appoint a principal designer on all house-building projects where more than one contractor is employed.

The role of the principal designer is to plan, manage, monitor and coordinate the pre-construction phase of the project, and to ensure where possible that all elements of health and safety have been considered and designed in to the scheme.

Where we have current CDM projects with you the following points apply:

- **You need to appoint a principal designer** - if you are starting a new project

- **You need to appoint a principal designer** - if we are currently acting as CDM co-ordinator and your scheme continues beyond 6th October 2015

- **Nothing changes** - if we are currently working on a project that will be concluded by 6th October 2015, we will continue to work with you.

The new CDM 2015 regulations may seem daunting, but don't worry - we can help!

Our CDM advisory service is a suite of solutions to help you undertake your duties under CDM 2015. We will work with you and support your principal designers in their CDM responsibilities, guiding and assisting when required.

For further information visit www.nhbc.co.uk/cdm call the health and safety department on **01908 746113**, or email h&scdm@nhbc.co.uk.

DEFECTS PREVENTION COURSE

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

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

COURSE	DURATION (DAYS)	STANDARD	NHBC REGISTERED BUILDERS
In-company	3	£4,000 + VAT	£2,500 + VAT*
Open	3	£550 + VAT	£450 + VAT*

DATE	LOCATION	DATE	LOCATION
22, 29 September, 6 October	York	13, 20, 27 October	Maidstone
24 September, 1, 7 October	Warrington	15, 22, 29 October	Bristol
8, 15, 22 October	Edinburgh	05, 12, 19 November	Milton Keynes

* This course is subsidised by NHBC for registered builders as we recognise its direct benefits in raising standards on site.

For further information and to book visit www.nhbc.co.uk/training.

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 the new digital format Standards Plus via the NHBC Portal at: www.nhbc.co.uk/PortalLogin

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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