

Technical Extra

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In this issue:

NHBC STANDARDS



Pitched roofs - is standard bracing acceptable?

page 3

REGULATION AND COMPLIANCE



Commissioning gas installations

page 5

Building Regulations update

page 6

Access provisions for new dwellings

page 8

Pre-completion testing of fixed fans

page 11

GUIDANCE AND GOOD PRACTICE



Simple defects can lead to major remedial work and associated components - a case study on above ground drainage and associated works

page 14

NHBC Foundation and the Zero Carbon Hub

page 18

Increased registrations placing demands on materials and skilled labour

page 19

Site water testing

page 20

Low-strength factory-made mortar

page 22

Infiltration SuDS map

page 24

INFORMATION AND SUPPORT



Technical news

page 25

Information and support

page 26

Foreword



Welcome to *Technical Extra 11*

Feeding back the lessons learnt from our claims experience remains a vital part of NHBC's work. In this edition, we include a case study highlighting a multi-million pound claim; a result of relatively simple defects on a multi-storey development which led to considerable disruption and inconvenience to homeowners, and major remedial works.

Green shoots, tentative recovery, early signs of growth; whatever you call it, increasing registration figures and activity are having an impact on the availability of materials, products, systems and skills. We discuss some of the issues.

We also highlight some upcoming changes to Approved Documents Part A, C and L, and provide guidance on complying with Part M (Access to and use of buildings) and some initial feedback on a survey of ongoing sites relating to this area.

The scope of work covered by commissioning certificates for gas installations changed with the move from CORGI to Gas Safe. In this edition, we remind readers of the implication of these changes on what is covered in the certificate and highlight builders' responsibilities.

Other articles include requirements for duo-pitched roof bracings and site water testing. We include an update on the now-published infiltration SuDS Maps from the British Geological Survey; a topic covered at this year's Building for tomorrow roadshows. Details of next year's events are included in the information and support section.

Finally, I'm delighted to announce the launch of our first ever technical mobile app. Free to download for registered builders, the Foundation Depth Calculator has been designed as a true field based pocket tool to help you calculate the correct foundation depths when building near trees in clay soils. To find out more visit www.nhbc.co.uk/apps.

I trust you'll find this edition useful and of benefit to your business in raising standards and reducing costs.

Mark Jones

Head of House-Building Standards

NHBC STANDARDS

Pitched roofs – is standard bracing acceptable?



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

INTRODUCTION

Duo-pitched trussed rafter roofs should be designed to support applied loads and self-weight without undue movement, and be appropriately braced to prevent distortion or failure and stabilise gable walls under wind loading.

But, do you know how bracing should be designed and installed?

STANDARDS CHAPTER

Chapter 7.2 'Pitched roofs'

REQUIREMENTS

The building designer should specify all bracing which, for roofs up to a 12m span, would generally follow the standard guidance set out in NHBC Standards Chapter 7.2 'Pitched roofs' clauses D5 (c), S6 and Appendix 7.2-B.

However, there are additional limitations on the use of the standard guidance, including the effect of increased wind loads due to the height of the roof construction, the roof pitch and the geographical location, i.e. buildings erected on long stretches of open, level or near-level land with no shelter. Further considerations are the length of supporting masonry walls between vertical lateral restraints and the area of separating and gable walls (if applicable) requiring lateral support.

To determine appropriate wind loads imposed on the roof, a basic wind zone map is used (BS 5268-3:2006 Figure A.6) to divide the UK. The allowable roof pitch and span will be dependent on the building height and which zone the building is located within.

If your roof pitch or span exceeds these limits, additional design consideration over and above standard bracing may be necessary.

Therefore, to determine if additional design consideration is required, the design and installation should consider the:

1. location
2. number of storeys
3. roof pitch
4. roof span
5. length of supporting masonry walls between vertical lateral restraints.

The table below is developed from BS 5268-3:2006 Fig A.5 and is an extract from Appendix 7.2-B. It shows how the allowable roof span changes depending on the number of storeys in different locations for either a 30° or 35° duo-pitched roof.

| | Pitch | Maximum allowable roof span of duo-pitched roofs (metres) | | |
|---------------|-------|-----------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------|
| | | Location | | |
| | | England and Wales | Scotland, Northern Ireland and Isle of Man | Areas of Scotland north or west of Ullapool, and Northern Ireland, northeast of Londonderry |
| Single storey | 30 | 12.0 | 11.6 | 10.6 |
| | 35 | 10.6 | 9.8 | 8.6 |
| Two storey | 30 | 11.5 | 10.0 | 8.7 |
| | 35 | 9.1 | 7.7 | 7.2 |
| Three storey | 30 | 10.2 | 8.8 | 7.5 |
| | 35 | 8.5 | 7.2 | 6.0 |

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

NHBC STANDARDS

Pitched roofs – is standard bracing acceptable?



REQUIREMENTS (CONTINUED)

House builders are generally constructing buildings with a roof span of between 6 and 10 metres, and therefore, unless the roof pitch is 30° or greater, standard bracing may be acceptable for buildings up to and including three storeys in height across all wind zones.

Note: The table highlights that 10-metre spans cannot be achieved for all building heights.

Where standard bracing is not appropriate, the bracing should be designed by a qualified person with suitable knowledge and experience in conjunction with the truss manufacturer, and all relevant drawings and details should be made available on site.

For further guidance on standard bracing and for conditions of use, please refer to Appendix 7.2-B of NHBC Standards, BS 5268-3:2006 '*Structural use of timber - code of practice for trussed rafter roofs*' and the Trussed Rafter Association website (www.tra.org.uk).

YOU NEED TO...

- Ensure that the roof bracing requirements for each home you construct is designed and installed in accordance with the above guidance
- Ensure that, where standard bracing is not appropriate, the bracing is designed by a qualified person with suitable knowledge and experience in conjunction with the truss manufacturer, and all relevant drawings and details are available on site.

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

REGULATION AND COMPLIANCE

Commissioning gas installations



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

INTRODUCTION

The scope of work certified by gas installers under the Gas Safe Register is not as wide as would previously have been covered by the CORGI Competent Persons Scheme, which it replaced in April 2009. As a result, areas of the Building Regulations which may have previously been included within a CORGI gas installer's Competent Persons Certification must now be considered by the builder.

REQUIREMENTS

A Competent Persons Scheme allows its members to self-certify their work for the purposes of the Building Regulations, and for building control bodies to accept the certification as evidence that, not only the area of work covered by the Competent Persons Scheme complies with the Regulations, but also the areas of the Regulations outside of the scheme that nevertheless would be affected by it. For instance, in respect of the CORGI Competent Persons Scheme for gas installations, a certification issued by a gas engineer registered under it would not only have covered the installation of the gas appliance, but also areas where the installation would have affected Part A (Structure), such as notching of joists, or Part B (Fire), such as where the installation breached any compartmentation.

Gas Safe Register replaced CORGI as the gas registration body in Great Britain and the Isle of Man on 1 April 2009, and Northern Ireland and Guernsey on 1 April 2010. However, it is not a Competent Persons Scheme and, as such, Installation and Commissioning Certificates issued by gas installers under the Gas Safe Register only cover the installation of the appliance and/or system in

accordance with the Gas Safety (Installation and Use) Regulations 1998 (GSIUR). Other areas of the Building Regulations affected by the installation would not be covered, as the gas engineer is unable to self-certify these works.

This does not, of course, mean that, where the installation does affect other areas of the regulations, the work will be incorrect; but builders should note that it is their responsibility to ensure that, where the installation does affect other areas of the regulations, the work carried out has not affected compliance in that area.

YOU NEED TO...

- Check with your gas installer exactly what is covered by any Installation and Commissioning Certificates, and satisfy yourself that any other areas connected to, but not covered by, the certification meet the minimum requirements of the Building Regulations.

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

REGULATION AND COMPLIANCE

Building Regulations update



Who should read this: Technical and construction directors, architects, design teams, surveyors and engineers.

INTRODUCTION

The Government has published details of revisions to the Building Regulations for England to be implemented in October 2013 and April 2014. The changes focus on Part A (Structure) and Part C (Site preparation and resistance to contaminants and moisture), as well as giving details of the next steps towards zero carbon homes with Part L (Conservation of fuel and power).

STANDARDS CHAPTER

Building Regulations Part A (Structure), Part C (Site preparation and resistance to contaminants and moisture) and Part L (Conservation of fuel and power).

REQUIREMENTS

The Government has published details of the update to three key areas of the Building Regulations for England.

Part A (Structure)

The Approved Document is being updated to contain reference to the latest British standards, which are based on Eurocodes. To support this, the Government will also be publishing additional guidance on:

- how withdrawn standards may still be used for some time, giving the industry time to adapt
- how building control bodies and engineers may continue to accept old design standards for smaller-scale work for the foreseeable future.

There are also other minor changes made to align guidance for strip foundations in shrinkable clay soils and the recovering of roofs with common practice.

Part C (Site preparation and resistance to contaminants and moisture)

Information relating to the requirement for radon protection measures is being updated to reflect the 2007 mapping by Public Health England and the British Geological Survey. There will be no change for home builders building in accordance with NHBC Standards, as the Standards have required homes to be built to these maps for some time. References to the new structural design British Standard for geotechnics will also be updated in the sections of Part C covering site investigations of sites.

The updated Approved Documents for Parts A and C will come into force on 1 October 2013.

Part L (Conservation of fuel and power)

The changes to Part L will now come into force in April 2014, and will set a requirement for new homes to achieve a 6% carbon improvement on 2010 regulations across the build mix. This is slightly lower than the 8% target originally put forward as the Government's preferred option when it consulted in 2012. House builders will continue to have flexibility in how they approach carbon targets but, keeping a focus on the building fabric, a fabric energy efficiency standards (FEES) will be introduced. There is also a target of a 9% improvement on Part L 2010 for commercial buildings. The Government also announced that it would shortly be consulting on the next steps to Zero Carbon Homes and also on delivering Allowable Solutions.

In summary, the headline changes are:

- a projected £16m of savings per annum to business
- a saving of 6.4 million tonnes of CO₂ per annum
- for new homes:
 - a 6% improvement on Part L 2010 across the build mix
 - an emphasis on building fabric with the introduction of FEES



REQUIREMENTS (CONTINUED)

- no quality assurance process for the building of new homes – instead, the Government is investing in a project looking at the performance gap through the Zero Carbon Hub

- for non-domestic buildings:

- a 9% improvement on Part L 2010 across the build mix
- minimum energy efficiency targets for air conditioning and lighting replacements.

The Government also announced that there will be no changes to the energy efficiency standards for extensions or replacement windows to homes.

Transitional Provisions

Part A (Structure) and Part C (Site preparation and resistance to moisture)

The new Approved Documents come into force on 1st October 2013 and will apply to all work subject to an Initial Notice, building notice or full plans submission served on or after 1 October 2013.

Part L (Conservation of Fuel and Power)

Specific details of the content of Part L 2014 have yet to be published but the government has confirmed that the transitional provisions will be similar to those for the 2010 regulations and those covering fabric energy efficiency rates.

In brief:

- where building work has commenced on site before 6 April 2014 the provisions on target energy efficiency rates will not apply; and
- where an initial notice, building notice or full plans submission served before 6 April 2014 the provisions on target fabric energy efficiency rates will not apply so long as work is commenced on site before 6 April 2015.

Commencement of work

In DCLG's opinion the commencement of work would usually be marked by work such as:

- excavation for strip or trench foundations or for pad footings;
- digging out and preparation of ground for raft foundations;
- vibrofloatation (stone columns) piling, boring for piles or pile driving;
- drainage work specific to the building(s) concerned.

DCLG considers that the following sorts of work would not be likely to constitute the commencement of work:

- removal of vegetation, top soil or removal/treatment of contaminated soil;
- demolition of any previous buildings on the site;
- excavation of trial holes;
- dynamic compaction;
- general site servicing works (e.g. roadways)

In some cases applications will be in respect of a number of buildings on a site, for example a number of houses. In such cases it is the commencement of work on the first of the buildings within the application which determines whether all the building work can take advantage of the transitional provisions, not each individual building.

Please talk to your NHBC Surveyor to discuss additional help we can provide and how we can help in registering your sites in time to meet with the transitional provisions.

For more information on the changes as it becomes available, please visit www.nhbc.co.uk/Builders/ProductsandServices/BuildingControl/NHBCTechZone.

YOU NEED TO...

- Be aware of what impact the changes to Parts A, C and L of the Building Regulations will have, and note when they come into force.

REGULATION AND COMPLIANCE

Access provisions for new dwellings



Who should read this: Technical and construction directors, design teams, surveyors, site managers and engineers.

INTRODUCTION

Part M of the Building Regulations requires that people, regardless of disability, age or gender, are able to gain access to dwellings and use their facilities both as visitors and people who live in them.

Following the changes to Part M introduced in April 2013, NHBC is publishing new industry-wide guidance to provide clarity and support the aims of the Building Regulations in achieving compliant access solutions to new dwellings.

STANDARDS CHAPTER

Guidance to comply with the provision of access to new dwellings in accordance with Approved Document M 2013 and the requirements of the Building Regulations 2010.

REQUIREMENTS

The objective of the access requirements in the Building Regulations is to provide reasonable provision, within the plot boundary, to allow a disabled person to gain access to the dwelling from the point of alighting from a vehicle positioned inside or outside the plot. In most circumstances, it should be possible to do this with a level or ramped approach to the dwelling.

It is acknowledged that the provision of access to a dwelling is often a matter of practicality and, with careful, up-front planning, it should be possible to provide an accessible solution to the majority of dwellings. The key factor in providing suitable access is the difference in height of the finished floor level from the point of alighting from the vehicle. Ideally, the difference should be minimal, so as to allow access to the dwelling with the least difficulty. Where this is not possible, the difference should be kept to a minimum.

The provisions for access to dwellings will normally apply from the point of access to the principal entrance. These are, in order of preference:

- level approach
- ramped approach
- stepped approach.

Provision of one of these will satisfy the Building Regulations.

If it is not possible to meet these provisions at the principal entrance, it would be reasonable to apply them to a suitable alternative entrance.

Provisions for access to the dwelling

Where the accessible route to the dwelling uses the driveway; for example, where the driveway provides visitor parking, this should be of sufficient width to enable someone to pass without being obstructed by a parked car (Diagram 1).

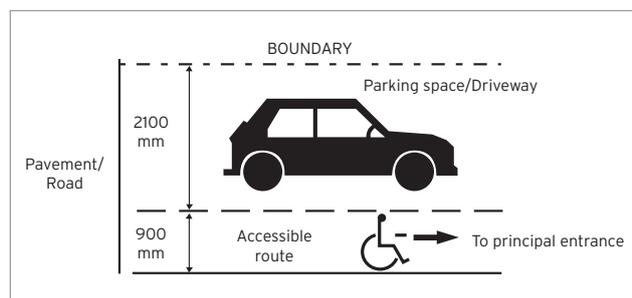


Diagram 1 - Driveway as part of the approach: maintain a 900mm clear access route

Where no parking is provided, the point of access would be considered to be the plot boundary.



REQUIREMENTS (CONTINUED)

Whichever type of approach is adopted, careful consideration must be given to the surface specification. The key issue is whether the material used provides a surface that is firm and even. Loose or uneven surfaces, such as gravel or cobbles, would not be suitable. An accessible approach is required from the point of access to the principal entrance. The principal entrance is best defined as the door most likely to be approached by a visitor to the home. The plot gradient (Diagram 2) will determine the type of provision that can be provided.

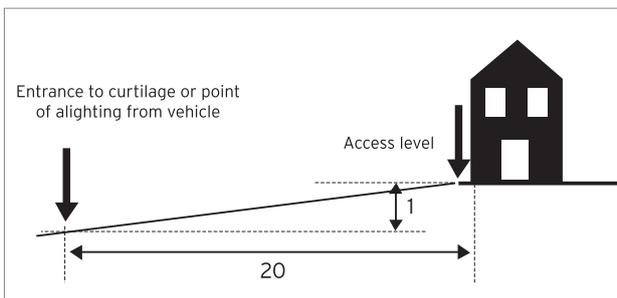


Diagram 2 - Plot gradient

It is measured from finished floor level to the point of access.

Level approach - the preferred solution is for a level approach with a gradient of 1 in 20 or shallower that provides the easiest method of showing compliance with the requirements of the Building Regulations. As an example, a level approach can be achieved with an even gradient over three metres from the point of access to the principle entrance for a difference in floor levels of 150mm.

Ramped approach - if the route from the point of access towards the principal entrance has a plot gradient exceeding 1 in 20, but does not exceed 1 in 15, a ramp can be provided in accordance with Diagram 3.

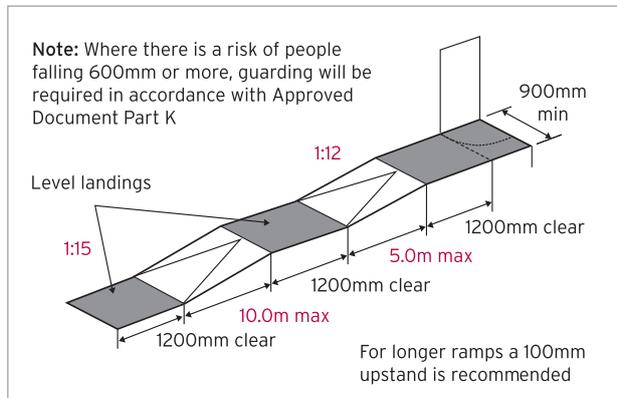


Diagram 3 - Ramped approach

Usually, the ramp would run directly towards the principal entrance, but if this cannot be accommodated, it may also be possible to run the ramp parallel to the external wall of the dwelling (subject to any planning restrictions). If this is the case, suitable provisions should be made for the damp-proofing arrangements for the external wall.

Where it is not possible to provide a ramp to the principle entrance in accordance with Diagram 3, either head on or by running the ramp parallel to the dwelling, Table 1 provides some alternative options which could be considered. These options provide for smaller landings and steeper but shorter ramps, and may allow for a ramp as an option, rather than a stepped approach. On plots where any of these options are proposed, this should always form part of the Access Strategy and be discussed as early as possible with NHBC Building Control.

| Table of alternative ramp options | | | |
|-----------------------------------|--------------|--------------------------|----------|
| Distance from point of access | Landing size | Length of ramp (on plan) | Gradient |
| 3000 | Level access | | 1 in 20 |
| 2900 | 1100 | 1800 | 1 in 12 |
| 2800 | 1000 | 1800 | 1 in 12 |
| 2700 | 900 | 1800 | 1 in 12 |
| 2600 | 1100 | 1500 | 1 in 10 |
| 2500 | 1000 | 1500 | 1 in 10 |
| 2400 | 900 | 1500 | 1 in 10 |

Table 1 - Alternative ramp options, assuming 150mm maximum rise into dwelling

Stepped approach - where the plot gradient exceeds 1 in 15, a stepped approach will be acceptable. Where steps are unavoidable on the approach, they must be designed to meet the needs of ambulant disabled people (Diagram 4):

- unobstructed clear width 900mm
- the rise of flights between landings is no greater than 1.8m
- top, bottom and intermediate landings that are a minimum of 900mm long (the bottom landing can form part of a public footpath, provided there are no obstructions)
- a suitable handrail to one side where the flight comprises three or more risers
- step profiles should be designed to avoid tripping hazards (for example, no contrasting nosings).



REQUIREMENTS (CONTINUED)

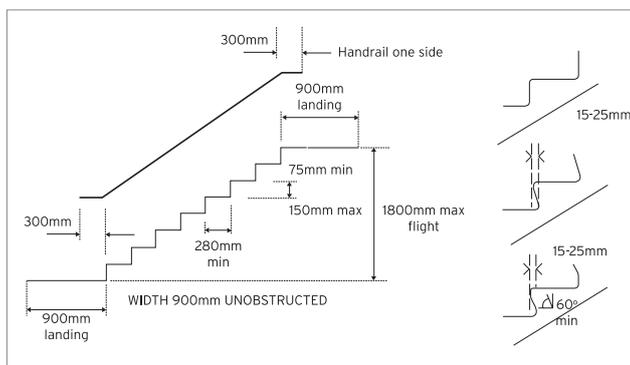


Diagram 4 - Stepped approach

Dwellings accessed directly from the public highway

Where the principal entrance to a dwelling is accessed directly from the public highway (pavement) and the finished floor level is set no more than 150mm above the level of the public highway, the plot gradient will clearly exceed 1 in 15. In this case, it would be reasonable to consider whether access arrangements can be provided to an alternative entrance, such as a side or rear door. If this cannot be achieved, a single step to the principal entrance is acceptable, provided the step is no more than 150mm (maximum rise for external steps). This step should be located at the door cill. An accessible threshold to the door should be provided. On plots where this solution is proposed, this should always form part of the Access Strategy and be discussed as early as possible with NHBC Building Control.

Access Strategy

It is important to engage with NHBC Building Control as early as possible in the design process, to ensure that the Access Strategy provides the best possible solution to all new dwellings on a development. On simple sites, where compliant solutions can be easily incorporated, this can be achieved with an early discussion between NHBC Building Control and the builder or designer. On more challenging sites, it may be necessary for a more in-depth engagement, with a written strategy and accompanying details showing the solutions to be incorporated.

Other considerations

The detailed design, layout and construction of the level access should not unduly compromise the resistance to damp penetration of the property or any requirement for underfloor void ventilation.

A recent survey of circa 3,000 ongoing sites identified a number of areas where improvement could potentially be made. For example:

- Access provision was left to be resolved on site in over 50% of the sites surveyed; at this stage, it may be too late to provide the optimum solution and the resultant configuration may be a compromise.
- Over 10% of the sites surveyed were found to have areas of the external walls where no additional precautions had been installed to prevent damp bridging where there is less than 150mm between DPC and ground level.
- One-third of the sites surveyed with underfloor void ventilation were found to have vents either below or 0-50mm above ground level. Provision at this height is likely to affect the efficiency of ventilation being provided, and leaves affected plots at a higher risk of damp penetration.
- An accessible threshold at the doorway with a maximum 15mm chamfered upstand is important, but ramped or level approaches must be accompanied by a clearable drainage channel to enable a weathertight junction to be maintained. Almost 25% of sites surveyed had not provided an adequate drainage channel.

Further guidance

NHBC Building Control's full guidance note can be downloaded for free from the www.nhbc.co.uk/Builders/ProductsandServices/BuildingControl/NHBCTechZone/BuildingRegulations/. The guidance also covers the facilities required in dwellings, as well as arrangements for internal circulation and provisions in common areas of apartment buildings. A useful Design Checklist for Access is also included, which can be used as an aide memoire when considering how to provide reasonable access in accordance with the provisions of the Building Regulations.

YOU NEED TO...

- Ensure you are aware of the change to Part M, introduced in April 2013. NHBC is publishing new industry-wide guidance to provide clarity and support the aims of the Building Regulations in achieving compliant access solutions to new dwellings. You can review this guidance at www.nhbc.co.uk/Builders/ProductsandServices/BuildingControl/NHBCTechZone/BuildingRegulations/.
- Ensure that detailed design, layout and construction of the level access does not unduly compromise the resistance to damp penetration of the property or any requirement for underfloor void ventilation.

REGULATION AND COMPLIANCE

Pre-completion testing of fixed fans



Who should read this: Technical and construction directors, site managers, electrical contractors and ventilation testers.

INTRODUCTION

Regulation 42 of the Building Regulations 2010 requires builders to provide evidence of the testing of all fixed fans to the building control body within five days of the test being carried out. The method of testing and reporting is described in the Domestic Ventilation Compliance Guide (DVCG). However, since its introduction in 2010, there have been challenges with the validity of the test information when using the equipment and methodology described in the DVCG for the testing of fixed fans used in a System 1 ventilation solution, as described in Approved Document F 2010.

NHBC is introducing new industry-wide guidance to overcome these issues. All plots put up for NHBC Building Control completion after 1 January 2014 should carry out the testing of fixed System 1 fans using one of the methods described below.

STANDARDS CHAPTER

Guidance to comply with Regulation 42 of the Building Regulations 2010.

REQUIREMENTS

It has been shown that the testing method adopted for System 1 installations as described in the DVCG can adversely affect the test results to indicate a failed performance against the recommended outputs in Table 5.1a of Approved Document F. NHBC has been working with industry and Department for Communities and Local Government (DCLG) to devise a solution to these issues, to allow the testing and reporting of fixed fans to be undertaken for all new dwellings.

Key issues

The key issues relate to the interpretation of the methodology for testing and the results produced in relation to the requirements of the regulations.

- Methodology - the DVCG mentions that the most common method for testing fixed fans is using a vane anemometer, or similar, placed in a hood covering the terminal. Although not intended by DCLG, 'terminal' has been interpreted by some as meaning the termination point of the fan, which

can be difficult to access as it is likely to be outside the building at high level or at the ridge in the case of a roof terminal.

- Presentation of results - vane anemometers place a restriction on the airflow of the fan and the result can often be less than the rated output of the fan itself, especially if an axial fan is being tested.

NHBC has now published a guidance note which provides three methods builders can follow to test, record and report the testing of fixed fans, in order to demonstrate compliance with the requirements to satisfy NHBC Building Control and discharge their obligations under Regulation 42. The first two are only covered briefly, and more guidance on these methods can be found in the BSRIA Document ED 46/2013 - Domestic Ventilation Systems - a guide to measuring airflow rates. The third method described provides a system which can be followed using the equipment recommended in the DVCG without any further information, in respect of the fan output or performance curve.



GUIDANCE

Testing location

In the majority of cases, the testing of fixed fans should be carried out at the terminal point within the room served by the fan.

Where the ventilation to a kitchen is provided via a cooker hood, it may not be possible to carry out the test at the terminal point. In this case, it may be reasonable to carry out the test on the outside of the dwelling, provided it can be done so safely. Where this is not possible, for example, if it is above ground-floor level, it would be reasonable for the building control body to take a view on compliance, taking account of the measured performance of the remaining fans in the dwelling.

Calibration of equipment

All testing equipment used should be correctly calibrated annually at a UKAS-accredited laboratory. The information relating to the calibration should be entered onto the results sheet and available for the building control body if requested.

Testing methods

Any of these methods can be used to show compliance, and the method used, along with any additional information required to verify the result, should be indicated on the results sheet.

Method 1 - The unconditional method

This measurement method uses a powerflow hood which eliminates back pressure and places no additional restrictions on the fans being tested. The results shown on the equipment can therefore be taken as the correct performance of the fan.



Method 2 - The conditional method

This method allows a wide variety of testing equipment to be used, including rotating vane anemometers, air capture hoods, thermal anemometers, thermal capture hoods, differential pressure anemometers and pressure pans.

Once the fan is tested, the reading is adjusted using a conversion factor specific to the fan make and model,

and the type of equipment being used. It is important that the correct conversion factors are used and must, in all cases, be specific to the installed fan.

The record sheet needs to be completed with the following information:

- fan make and model
- test equipment
- required output
- measured output
- specific conversion factor
- adjusted output.

Method 3 - Tested range method

This method can be used where the equipment in Method 1 is unavailable, or the installed fan does not have the required conversion factors or performance curves required to adjust the measured results achieved with Method 2.



The test procedure is carried out as described in Method 1 and 2 using a vane anemometer fitted with a hood, such as the one shown in the picture above. Minimum benchmark levels have been set, which factor the impact of the test equipment. If the fan performance exceeds the minimum benchmark value indicated in Table 2, it would be reasonable for building control bodies to assume that the fan is performing to the required level and accept the test results as showing compliance with Part F of the Building Regulations.

| Fan rating | Minimum benchmark performance |
|------------|-------------------------------|
| 15 l/s | 12 l/s |
| 30 l/s | 24 l/s |
| 60 l/s | 35 l/s |

Table 2



GUIDANCE (CONTINUED)

If the results fall below the minimum benchmark values, the following options are open to the builder:

- Check the installation has been carried out in accordance with the manufacturer's recommendations, that the correct rating of fan has been used and that there are no blockages or restrictions within any ducting.
- If the installation can be verified as being in accordance with the manufacturer's recommendations, the builder can retest the fans using Method 1 or 2, which provide more accurate means of measuring fan performance.

It should be noted that the presentation of results for any of the three methods described does not necessarily guarantee compliance. Building control bodies should use professional skill and judgement in ascertaining if an installation has been carried out correctly, and in gauging if additional investigation is required.

Following the introduction of this new guidance, all plots put up for NHBC Building Control completion after 1 January 2014 should carry out the testing of fixed System 1 fans using one of the methods described in this article.

Copies of the NHBC Guidance note on the testing of fixed fans, along with the accepted recording sheet, can be downloaded from the NHBC website. NHBC carries out Part F ventilation testing in partnership with BSRIA; to find out more or order tests, please contact 'Sales' on 0844 633 1000.

YOU NEED TO...

- Ensure that testing of fixed System 1 fans using one of the methods described is carried out on all plots put up for NHBC Building Control completion after 1 January 2014.

GUIDANCE AND GOOD PRACTICE

Simple defects can lead to major remedial work and associated components - A case study on above ground drainage and associated works



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

INTRODUCTION

In this, the first of a series of case studies designed to look at high cost claims and lessons to be learnt from them, we look at a valid claim for defective above-ground drainage on a multi-storey development. We describe 'what went wrong', highlight technical information available and give key messages to help builders minimise the risk of future failures of a similar nature.

GUIDANCE

Background

NHBC claim investigators visited a multi-storey development following reports of numerous leaking soil stacks. The vertical soil stacks connected into horizontally suspended soil stacks within a basement car park.

From what initially appeared to be a relatively minor issue, intrusive investigations indicated that the soil stacks and associated works were not installed in accordance with relevant Building Regulations and other statutory requirements. The result of these findings led to considerable disruption and inconvenience to homeowners, and remedial works costing millions of pounds.

What went wrong?

There were three separate areas of defective work relating to:

1. installation of the sanitary pipework
2. adequacy of the fire resistance provided to separating walls and floors
3. installation of the unvented hot water storage systems.

The failure of the soil stacks was the primary defect and led to the discovery of the latter two areas.

Examples of the defective work included:

- inadequate sealing or fire stopping at service penetrations

- safety devices not provided on unvented hot water systems
- incorrect pipework and couplings used and mismatched
- lack of support throughout the full height of the soil stacks
- vertical stacks terminating into 92° junctions
- opposed connections into soil stacks
- pipework connections into the base of soil stacks
- inadequate falls to horizontal pipework
- missing sound insulation to pipework.

The findings

Installation of sanitary pipework

Numerous areas of the sanitary pipework were found to be defective due to poor workmanship. Below are seven areas to consider when installing sanitary pipework.

1. **Installation**
 - a. **Jointing** - when jointing pipework, one method should be used throughout. Ensure that the chosen method is suitable for the type of pipework being used, and that male and female couplings are the correct way round for the flow direction.
 - b. **Access for maintenance** - ensure that access points are easily accessible. In multi-storey buildings, access to pipework should be provided at no more than three-storey intervals.

Simple defects can lead to major remedial work and associated components - A case study on above ground drainage and associated works



GUIDANCE (CONTINUED)

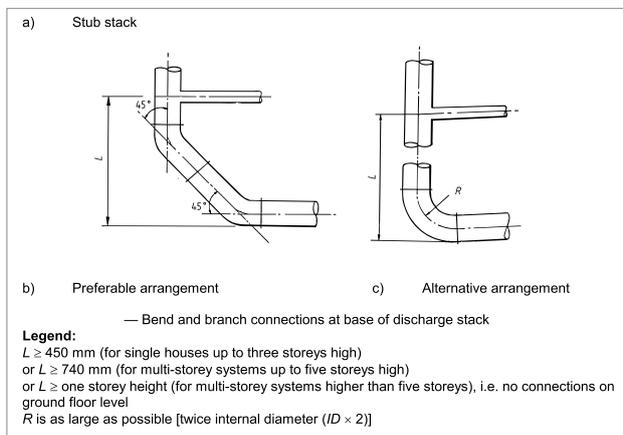
2. Low-level branch connections at the base of stacks

- Single dwellings of up to three storeys - the lowest branch connection should be at least 450mm from the base of the stack.
- Multi-storey buildings up to five storeys - the lowest branch connection should be at least 750mm from the base of the stack. Alternatively, connect the ground-floor appliances to their own stack or the horizontal drain.
- Multi-storey buildings over five storeys - the ground-floor appliances should connect to their own stack, unless discharging to a gully or drain.
- For buildings over 20 storeys high, it may be necessary to connect both the ground - and first-floor appliances into their own stack.

3. Bends at the base of soil stacks

Bends at the base of a discharge stack should have a large radius, with a minimum centre-line radius of 200mm. Alternatively, you can:

- Have two 45° radius bends
- Increase the diameter of the bend at the base of the stack (this may oversize the drain and be uneconomic).



4. Pipe support

Fixings for pipework shall be secure, stable and not cause damage to pipework or to any other element of the building. The effects of thermal movement should be taken into account.

The distance between pipe supports should not exceed those shown below. In vertical pipe runs, there should be at least one pipe support bracket at each storey height, fixed behind a collar to support the vertical load and avoid downward movement of the pipes and loss of expansion gaps.

Supports should be adjacent to joints and of adequate strength to carry the weight of the pipe plus contents. Where the layout requires shorter lengths than the maximum, support distances should be adjusted to suit.

| | Diameter (mm) | Vertical pipes (m) | Low gradient pipes (m) |
|------------------|---------------|--------------------|------------------------|
| Plastic pipework | 32 | 1.2 | 0.5 |
| | 40 | 1.2 | 0.5 |
| | 50 | 1.2 | 0.6 |
| | 75 to 100 | 2.0 | 1.0 |
| | 150 | 2.0 | 1.2 |

Table 3

Note 1: Where two or more fittings are adjacent on low gradient pipes, additional fixing should be provided.

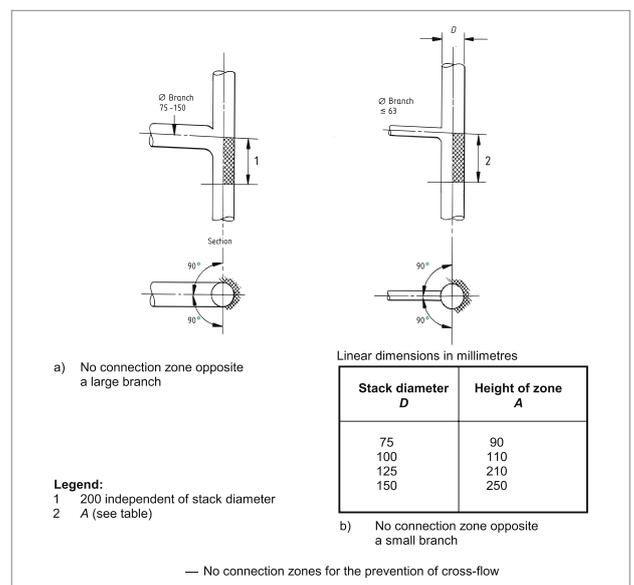
Note 2: Supports should be located close to and downstream of sockets. Additional supports are recommended at junctions and changes in direction.

5. Thermal movement

The movement caused by temperature changes in pipework requires special consideration. Adequate provision for expansion should be made, especially with pipes made of plastics and copper. Where pipes of these materials pass through walls or solid floors, sleeves should be provided.

6. Crossflow prevention

A branch pipe should not discharge into a stack in a way which could cause crossflow into any other branch pipe. A branch creates a no connection zone on a stack, as shown in the diagram below. No other branch may be fitted such that its centre line falls inside a zone, but its centre line may be on the boundary of the zone.



GUIDANCE AND GOOD PRACTICE

Simple defects can lead to major remedial work and associated components - A case study on above ground drainage and associated works



GUIDANCE (CONTINUED)

7. Testing

Pipes, fittings and joints should be capable of withstanding an air test of positive pressure of at least 38mm water gauge for at least three minutes. Every trap should maintain a water seal of at least 25mm. All completed sanitary pipework should be tested.

Fire safety

Where soil stacks and waste pipes passed through separating walls and floors, the fire resistance of these elements had been compromised by poor workmanship.

Action: adequate sealing or fire stopping should be provided where an opening is formed to allow services to pass through. Section 7 of Approved Document B (Volume 1) provides guidance on how this can be achieved.

Two key areas to consider are:

1. Sealing around service penetrations

Industry best practice is for such fire stopping to be provided by a specialist company complete with appropriate labelling. This is the best method of ensuring satisfactory fire resistance and separation.

A satisfactory level of protection may also be achieved by suitable fire-resisting materials, such as fire resisting foams and mastics or tightly packed rock mineral fibre quilt, fixed in accordance with the manufacturer's fire-tested and approved details.

2. Intumescent collars/wraps

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 and sited to finish flush with the wall or floor they penetrate, and any gaps suitably filled.

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, it is required to concrete this type of intumescent protection into the floor structure, to ensure that it maintains the degree of fire separation required.

For additional practical guidance on fire safety, please contact osupplies@nhbc.co.uk and request free copies of *A practical approach to achieving fire safety* (HB2593 12/09).

Further support and free training for registered builders and developers is available from NHBC's [Learning Hub](#).

Installation of unvented hot water storage systems

In relation to the installation of the unvented hot water storage systems, example problem areas included the omission of a tundish, waterless traps installed incorrectly, other waste pipes connected to the discharge pipe and the wrong type of pipework and jointing methods used.

Action: Section G3 of Approved Document G provides guidance on the installation of unvented hot water storage systems.

Five key areas to consider are:

1. Safety devices

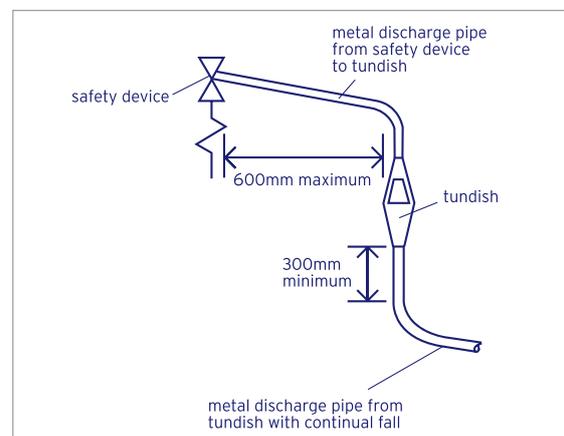
At least two safety devices should be provided to prevent the temperature of stored hot water from exceeding 100°C. These devices are:

- a non-self-resetting thermal cut-out
- a temperature or temperature and pressure relief valve.

2. Discharge

For the hot water to be discharged safely from the temperature or temperature and pressure relief valve, the following points should be followed:

- An air break in the form of a tundish should be provided within 600mm of the relief valve and there should be a vertical section of pipe at least 300mm long before any bends in the



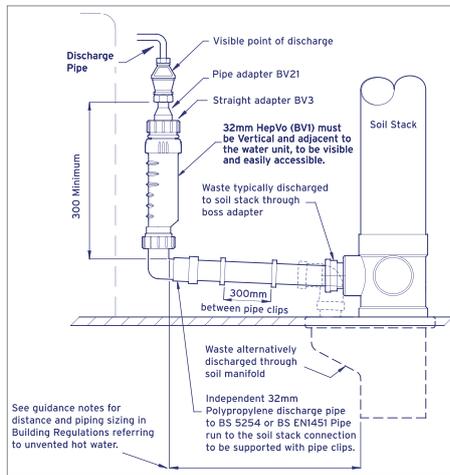
Simple defects can lead to major remedial work and associated components - A case study on above ground drainage and associated works



GUIDANCE (CONTINUED)

pipework beyond the tundish.

- The pipework should be of metal and, beyond the tundish, be at least one pipe size larger than the outlet size of the relief valve.



- The pipework should be designed to have a resistance to flow of water not greater than that of a straight pipe 9m long - bends increase the resistance to flow and should be taken into account when calculating the resistance. It may be necessary for the pipe size to be increased in the case of long discharge pipes or those with bends.
- The pipe should be laid to a continuous fall.

3. Connection into a soil vent pipe (SVP)

- Connection into an SVP is only permitted with the use of a HepVo waterless valve.
- The trap should be installed vertically.
- The discharge pipework should not connect with any other waste pipework/traps.

4. Pipework material

- Where metal pipework is not used, polypropylene pipework and fittings must be used due to the high temperatures encountered.
- The pipework should have the following information at a maximum of 1m intervals:
 - Manufacturer's identification.
 - The number of the British Standard 'BS 5254' or 'BS EN 1451-1'.
 - The material code (PP).
 - The nominal size.
- Only use pushfit joints.
- Pipework should be adequately supported (normally clipped at 300mm centres).
- Polypropylene pipework is unsuitable for external use.

5. Certification

- The system should be a proprietary unit or package with third-party approval or certification, or that has been independently assessed.
- Installers must be competent to install the system, and their details should be entered on the label attached to the system.

Further guidance is available via the supplementary resource area in *Standards Plus*, which features an article alongside Chapter 8.1 titled 'Discharge your responsibilities correctly' that details how to connect a discharge pipe to an SVP.

YOU NEED TO...

- Ensure that the design complies with the requirements of the relevant Building Regulations and statutory requirements, e.g. Approved Document B, Approved Document G and BS EN 12056. The above list is not exhaustive and only given as an example
- Make sure that the level of workmanship on site complies with the designer's requirements, Building Regulations and relevant statutory requirements
- Contact your building inspector 24 hours prior to the pre-plaster or block; carry out pre-plaster and fire safety check inspections to ensure that the work is inspected by NHBC
- Be satisfied that:
 - all pipes, fittings and joints are capable of withstanding an air test of positive pressure of at least 38mm water gauge for at least three minutes
 - every trap can maintain a water seal of at least 25mm
- Note the further guidance and training available on *Standards Plus* and NHBC's corporate website.

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

GUIDANCE AND GOOD PRACTICE

NHBC Foundation and the Zero Carbon Hub



Who should read this: Everyone.

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.

GUIDANCE

Mechanical Ventilation with Heat Recovery (MVHR) systems in new homes (RR8)

A recent report from the Zero Carbon Hub-led Ventilation and Indoor Air Quality (VIAQ) Task Group has concluded that much work needs to be done to ensure good performance of Mechanical Ventilation with Heat Recovery (MVHR) systems in new homes.

Reinforcing findings of its interim report published in January 2012, the VIAQ Task Group recommends that concerted government-led action should be taken to develop and promote good practice and ensure public health and safety, with new research informing future Building Regulations.

Over the past few years, the trend towards higher levels of energy efficiency of new homes has led to improved building fabric airtightness and the increased use of MVHR. In 2012, 24,000 MVHR fan units were installed in the UK, a trend that is set to continue.

Despite the number of MVHR units installed, very few have been monitored in use. However, the majority of the available evidence from the UK and other countries points to issues that need to be addressed as a matter of priority - design, installation, commissioning, operation and use, all of which affect system performance and could compromise air quality.



Based on the evidence reviewed by the VIAQ Task Group over a four-year period, there is little doubt that poor indoor air quality is connected with a wide range of undesirable health effects, including allergic reactions and asthma symptoms. The Task Group's findings reinforce the need for the design, construction and commissioning of

buildings to be undertaken with internal air quality and the provision of adequate ventilation firmly in mind, to ensure that homes provide a comfortable and safe internal environment for occupants.

With MVHR already being installed in around one-quarter of new homes, it is clearly essential that the concerns identified are dealt with urgently. As part of this process, NHBC is completing the development of a new NHBC Standards chapter giving good practice guidance on MVHR, which will be published towards the end of the year.

YOU NEED TO...

- This article is for general interest. There are no actionable requirements, although readers are advised to note the findings of the reports. The new NHBC Standard on MVHR will be published in October.
- If you have any doubts as to whether NHBC requires additional information, discuss this with your normal NHBC contact and/or Standards and Technical on 01908 747384.

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

Increased registrations placing demands on materials and skilled labour



Who should read this: Technical and construction directors and managers, manufacturers, architects, designers, specifiers and purchasers.

INTRODUCTION

Hopefully, you'll have seen some of the encouraging figures relating to registration volumes that have been reported over recent months. NHBC published figures earlier in the year showing that the number of new homes registered in the first six months of 2013 was at its highest level since 2008.

However, NHBC is beginning to see the knock-on effect of this, with material and skills shortages becoming more commonly reported by a number of builders in many parts of the country. Meeting consumer demand and construction targets must not be achieved at 'any risk'.

GUIDANCE

As the volume and pace of development increases, so does the pressure on the supply of materials, products and systems for use in construction. Many builders, unable to source specified products, are searching for alternatives in order to maintain their build programme.

In many cases, simply substituting one manufacturer's product for another with similar properties and performance characteristics will be acceptable. However, it is important to ensure that the selected alternative material, product or system complies with NHBC Technical Requirement R3 (Chapter 1.1), particularly where elements are used for critical functions. Even when products look similar, there may be crucial differences in performance that are not obvious to the buyer or construction team.

In order to ensure that construction on site is not delayed unnecessarily, please consider product supply at an early stage and, if it is necessary to find a suitable alternative product, please notify NHBC as soon as possible. We can then advise you either that your alternative choice is acceptable without further consideration, or that evidence of suitability is required. Providing acceptable evidence of suitability may mean you have to obtain a satisfactory assessment of the material, product or system by an appropriate independent technical approvals authority accepted by NHBC. Remember that this process can take some time, so early consideration is advised,

particularly in the case of products being imported into the UK.

When considering material, product or system substitution, you should always:

- consider their availability on the market as early as possible
- notify your contact at NHBC as soon as possible to check if additional evidence of satisfactory performance for the substitute material, product or system will be required
- avoid using alternative products and systems etc. without first confirming suitability with NHBC
- consider any impact of substitution; for example, labour skills or additional training requirements
- remember, if in doubt, check with your appropriate NHBC contact in the first instance or call Standards and Technical on 01908 747384, or email technical@nhbc.co.uk

Skills

In addition to material-supply issues, the availability of suitably skilled labour is also of growing concern. *The Home Building Skills Report* was published in August; read more about this in the 'Technical news' section at the back of this edition of Technical Extra. Further information, including a copy of the report, is available at www.homebuilding-skills.com.

YOU NEED TO...

- Ensure your approach to increasing demands on materials, products, systems and labour does not compromise standards or compliance with Building Regulations
- Liaise with NHBC regarding any potential product substitution.

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

GUIDANCE AND GOOD PRACTICE

Site water testing



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

INTRODUCTION

When applied properly, site water testing is very useful in providing an early indication of the as-built performance of those parts of a building envelope that have been designed to resist water penetration to the interior.

GUIDANCE

These tests, when carried out at early stages of installation as an integral part of a phased construction programme, should provide important quality assurance for building envelopes and specialist façade system installations prior to final hand over and occupancy. However, if the tests are incorrectly applied or incorrectly verified giving a false impression of likely performance, it undermines the whole process of meeting accepted standards for checking and inspecting the quality of sitework and installation. In the worst case, this could result in systemic and costly problems developing over entire building façades.

Requirements for site water testing are set out in NHBC Standards Chapter 6.9. The information from site water testing is very important in providing verification that multi-million pound façades and key building interfaces are capable of performing, as-constructed in terms of both watertight jointwork, junctions and water-managed cavities. The design should ensure that any moisture build-up or water penetrating the outermost weatherline should be effectively drained out to the exterior, without causing excessive wetting of the backing wall or the internal building fabric, i.e. insulation zones. There should be no unacceptable level of water penetration through the façade at interfaces and waterproofing lines of defence. In particular, water should not be found to have leaked inwardly to affect any internal parts of building walls and façades that are designed to remain both dry and thermally protected from wetting effects.

On-site water testing requires a suitably experienced test operative to check visually for leakage at key



intervals during the test process. This means that key parts of the wall need to be left exposed for inspection, otherwise the visual check is not possible and testing cannot verify whether leakage has actually penetrated to the more vulnerable internal parts of the façade wall.

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



GUIDANCE



One of the most important objectives of site water testing is for early identification of any water leakage paths that may exist in the as-built construction. This is an essential part of good site QA, as well as complying with requirements set by both NHBC and CWCT Standards. All on-site water testing should be carried out to meet the CWCT Standards for building envelope performance assessment. Where leaks are found, NHBC will require suitable evidence that robust remedial measures have been identified and submitted to the appropriate manufacturers for approval. Materials used in repair work will also need to meet NHBC Technical Requirement R3 in terms of fitness for purpose for fully durable remediation of leakage.

Where the correct testing procedure and reporting has not been followed, NHBC has found various problems, including the following:

- Ineffective test method and poor technique, e.g. involving non-accredited contractors, untrained operatives and use of uncalibrated equipment.
- Inadequate observation of the testing carried out - disregarding the recommendations in accepted standards.

- Inaccurate or unclear reporting of test results.
- Defective remedial work.

For obvious reasons, reported results from testing where water has been applied to a façade but no internal inspection has been practically possible, e.g. due to finishes being in place, will not be accepted.

Reliable proof of performance is always required by NHBC, and this can only come from adopting a proper approach to testing - using accredited, suitably qualified contractors who understand, carry out and accurately report all testing to verify the as-built performance of the building envelope.

YOU NEED TO...

- Ensure site water testing proposals are planned into the construction programme at an early stage
- Undertake testing at a time when it can be effectively assessed, i.e. ensure that key parts of the wall need to be left exposed for inspection
- Use accredited, suitably qualified contractors, and make proof of performance available for review.

GUIDANCE AND GOOD PRACTICE

Low-strength factory-made mortar



Who should read this: Technical and construction directors and managers, architects, designers, mortar producers, specifiers and purchasers.

INTRODUCTION

It has come to our attention that factory-made designed masonry mortar mixes with a declared compressive strength of 2.5N/mm² (compressive strength class M2.5 to BS EN 998-2:2010) are occasionally being delivered to NHBC sites for use on low-rise housing in situations where, historically, prescribed masonry mortar mixes of designation (iii) would have been used.

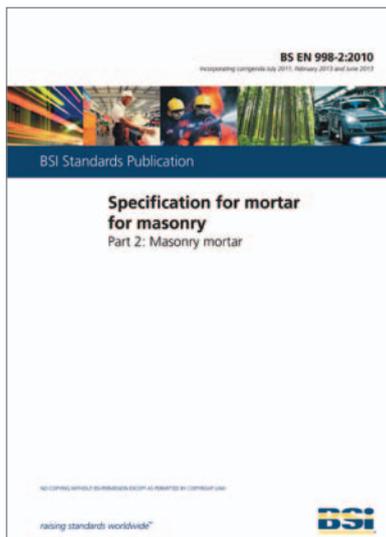
Mortar class M2.5 may be of lower compressive strength and durability than the generally accepted designation (iii) mortar mix commonly used on low-rise housing for external and internal masonry above DPC, in areas of exposure categories lower than severe or very severe.

GUIDANCE

Methods of specifying masonry mortar

In the UK, factory-made masonry mortars for use in construction of low-rise housing should be specified in accordance with BS EN 998-2:2010, and may be supplied either as 'designed' masonry mortar mixes with a minimum compressive strength or compressive strength class declared by the manufacturer, or as 'prescribed' masonry mortar mixes, with mix proportions and relationship to compressive-strength declared by the manufacturer based on published UK experience.

There is a fundamental difference between the two methods of specifying masonry mortars, and these are defined in BS EN 998-2:2010 as follows:



- Prescribed masonry mortar - mortar made in predetermined proportions, the properties of which are assumed from the stated proportion of the constituents (recipe concept).
- Designed masonry mortar - mortar whose composition and manufacturing method is chosen by the producer in order to achieve specified properties (performance concept).

Prescribed masonry mortar mixes under the former British Standard BS 5628-3 (no longer current and replaced by PD 6697, but still cited in the Building Regulations Approved Document A 2004 edition incorporating 2010 amendments) were defined by mortar designation (i.e. (i), (ii), (iii) and (iv)).

Table NA.1 of the National Annexes to BS EN 998-2:2010 provides an accepted relationship, based on experience gathered over many years in the UK, between performance concept-designed mixes, defined in terms of mortar class and recipe concept prescribed mixes, where constituent proportions are generally defined in terms of mix designations to PD 6678 (e.g. mix designation (iii) is deemed equivalent to mortar class M4 and mix designation (iv) is deemed equivalent to mortar class M2).

NHBC Standards Appendix 6.1-C gives guidance on the use of 'prescribed' mortars for particular locations in

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GUIDANCE

low-rise domestic construction. For example, a mortar designation (iii) has been accepted historically as achieving suitable performance characteristics in terms of strength, (masonry mortar designation (iii) is assumed to have a compressive strength of 4N/mm² at 28 days), durability and flexural capability for use in above dpc external and internal masonry construction in areas of exposure categories lower than severe or very severe.

Designed mortar mixes are an acceptable alternative to the use of prescribed mixes, but the manufacturer should declare the relevant performance characteristics of the mortar in accordance with BS EN 998-2:2010 Section 5.4 Properties of hardened mortar. Alternatively, if the declared strength of the designed mortar meets or exceeds the relevant mortar class for the mortar designation, as given in Table NA1 to BS EN 998-2:2010, it may be assumed that evidence of durability need not be provided.

Meeting the requirements of the Construction Products Regulation (305/2011)

In order to meet the requirements of the Construction Products Regulation (305/2011), masonry mortar manufacturers will be required to comply with the relevant system of assessment and verification of constancy of performance.

For a prescribed mortar, this requires the manufacturer to make a declaration based on initial type testing of the product and factory production control (system 4).

For a designed mortar, the manufacturer will need to make a declaration based on the foregoing parameters together with possible testing of samples at the point of production. In addition, a notified body will be required to certify factory production control (system 2+).

The verification requirements for the production of a designed mortar are therefore more onerous than for a prescribed mortar.

| Location | | Recommended cement: lime: sand mix | Recommended cement: sand mix with air-entraining plasticiser | Recommended masonry cement: sand mix | Mortar designation to BS EN 1996-1-1 |
|---------------------------------------|--------------------------------------------------------------|------------------------------------|--------------------------------------------------------------|--------------------------------------|--------------------------------------|
| General wall area above dpc | In areas of severe or very severe exposure - high durability | 1 : 1/2 : 4 1/2 | 1 : 3 1/2 | 1 : 3 | (ii) |
| | Other exposure categories - general use | 1 : 1 : 5 1/2 | 1 : 5 1/2 | 1 : 4 1/2 | (iii) |
| Below DPC level and in chimney stacks | - high durability | 1 : 1/2 : 4 1/2 | 1 : 3 1/2 | 1 : 3 | (ii) |
| Cappings, copings and sills | - low permeability | 1 : 0 to 1/4 : 3 | | | (i) |

Mortar mixes using ordinary Portland or sulfate-resisting cements where required (see also NHBC Standards Design clauses 6.1- D5(b) and (d)).

YOU NEED TO...

- Masonry designers/specifiers should provide sufficient information to the masonry mortar manufacturer to enable him to provide mixes suitable for their situation in the works
- Mortar manufacturers should be able to demonstrate that the mixes delivered to site are suitable for their location in the works in terms of strength, durability and flexural capability.

GUIDANCE AND GOOD PRACTICE

Infiltration SuDS map



Who should read this: Technical and construction directors and drainage designers.

INTRODUCTION

NHBC's 2013 Building for tomorrow (Bft) roadshows included a presentation on sustainable drainage systems (SuDS), with the British Geological Society (BGS) update highlighting the development of infiltration SuDS maps. These maps are now available; this article provides information on the requirements of SuDS and a brief introduction to the maps.

GUIDANCE

The Floods and Water Management Act 2010 included the provision for SuDS. The requirements are stated in the *National Standards for Sustainable Drainage* (draft), for which an implementation date has yet to be set. The standards require that developers consider using SuDS for any development over the size of a single dwelling. A hierarchy guides the selection of an appropriate scheme in the following order of preference:

- i) discharge to the ground
- ii) discharge to a surface water body
- iii) discharge to a surface water sewer
- iv) discharge to a combined sewer.

The use of infiltration SuDS (e.g. soakaways, permeable pavement and infiltration basins) must therefore be considered at most development sites. To determine whether infiltration SuDS are appropriate, the ground conditions, including drainage, ground stability and protection of groundwater quality, must be considered.

Infiltration SuDS Map

The British Geological Survey has produced a national Infiltration SuDS Map that enables a preliminary indication of the suitability of the ground for infiltration. The dataset is intended to support those involved in the planning and design of infiltration SuDS. The dataset comprises a series of 1:50,000

scale maps providing information on the properties of the ground. In particular, it considers:

- the presence of constraints that must be considered prior to planning infiltration SuDS
- the drainage potential of the ground
- the potential for ground instability when water is infiltrated
- the potential for deterioration in groundwater quality as a result of infiltration.

The maps can be used to determine the likely limitations present at a site, allowing preliminary decisions on the type of infiltration SuDS that may be appropriate.

Infiltration SuDS GeoReport: the data is available to purchase as a report that contains 24 map excerpts for a chosen ~2 km² area. It is most appropriate for occasional use, and is available from <http://shop.bgs.ac.uk/georeports/>.

Infiltration SuDS Map Viewer: the data can also be accessed through a web-based viewer service via an annual subscription. The viewer provides access to the entire national extent of the Infiltration SuDS Map and location-specific information can be downloaded. A sample can be viewed at <http://mapapps2.bgs.ac.uk/sudssampledtaex/sample.html>

For further information, see <http://www.bgs.ac.uk/products/hydrogeology/infiltrationSuds.html> or email enquiries@bgs.ac.uk.

YOU NEED TO...

- The Floods and Water Management Act 2010 included the provision for SuDS. The requirements are stated in the *National Standards for Sustainable Drainage* (draft), and further information on when this will be implemented will appear in future editions of Technical Extra.

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

TECHNICAL NEWS

NHBC Standards 2014, including Chapter 3.2 'Mechanical ventilation and heat recovery (MVHR)'

NHBC Standards 2014 will be published in October 2013, and will come into effect for every NHBC registered home whose foundations are begun on or after 1 January 2014. The next Technical Extra (TE12) will be issued in October to accompany the new chapter and introduce other changes to the Standards, along with feature articles on the new chapter.



Lime in construction

The British Lime Association is hosting a Lime in Construction seminar, created to discuss the future of UK construction and the use of lime in civil and building projects. The seminar will cover soil stabilisation and remediation for construction projects, and lime in hydraulic road binders and asphalt.

The seminar will be held on 24 October 2013 at Emirates Stadium, London, the home of Arsenal Football Club. For further information, visit www.britishlime.org



Audible cracking noises in intermediate floors

NHBC occasionally receives reports of a small number of homes that suffer cracking noises from intermediate floors as people walk across them. The exact location and cause of each cracking noise has been very difficult to establish from basic site observations and remedial works have had mixed success. To better understand the issues NHBC, Gypsum Products Development Association (GPDA) and UK Timber Frame Association (UKTFA) jointly commissioned Salford University Acoustics Research Centre to carry out detailed site investigations to find the location and ultimately the root cause of the noise.

Investigations were carried out in properties that exhibited the cracking noise phenomena. Each property had masonry walls and drylined finishes with engineered joist floors and chipboard flooring. Multiple sources of cracking noises were identified but each noise could be tracked to the junction between the wall lining and the underside of the floor structure at the point where a floor joist was built into the wall.

At each source of cracking noise solid connections were found between the drylining and the floor joists. By cutting through these solid connections to isolate the wall finishes from the floor joists the cracking noise was eliminated. Remaining noises identified in the floors were found to be typical of someone walking over a floor.

The exact mechanism that generates the noises is still unclear but it is felt that with careful attention to installation procedures and good workmanship the risk of cracking noises in intermediate floors may be avoided.

Based on the research it is advised that when constructing the junction between the wall and floor care should be taken to ensure the gypsum plasterboard adhesive does not spread up behind the plasterboard to set in contact with the floor joists.

For further information refer to the GPDA and UKTFA websites:

www.gpda.com

www.uktfa.com

Home-building Skills

A new Home Building Skills Report has been produced jointly by NHBC, HBF, CITB and the Zero Carbon Hub. The report looks at the impact of the downturn on the industry and how builders are looking to the future to ensure they have the skills to build more homes as we move into recovery.

The report identifies the need to address skills and knowledge gaps across the industry and, to help tackle this, NHBC and the partner organisations have developed a new skills portal which signposts people to training, skills and qualifications in the housing industry.

Further information about this project, including a copy of the report, is available at: www.homebuilding-skills.com



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



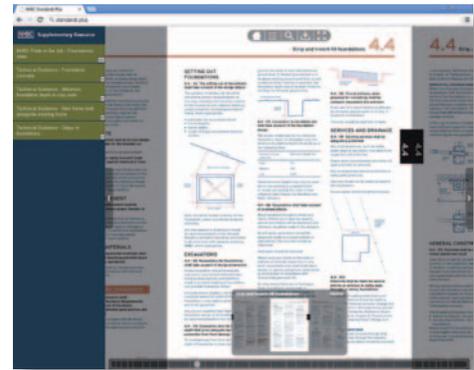
NHBC STANDARDS PLUS

NHBC Standards Plus is the fully interactive online version of the NHBC Standards that includes a range of supplementary technical information all in one place.

It's available **FREE** to registered builders, developers and subscribers to NHBC Standards.

Benefits of NHBC Standards Plus:

- Free, fast online access available 24/7 - suitable for site, office and home-based working.
- All in one place - a single, fully interactive digital publication with extensive technical guidance and support.
- Colour coding to improve navigation.
- Built-in 'word search' function.
- Extra technical content, such as videos and Technical Guidance Notes, filtered by Standards chapter.
- An option to print, save or forward sections of information.
- Storage of bulky documents reduced.



Early feedback on how Standards Plus is being used is encouraging. To date, pages most often viewed relate to NHBC Standards Chapters 7.1 'Flat roofs and balconies', 7.2 'Pitched roofs' and 9.2 'External works'.

For further information, including a demonstration video showing how it works, please visit www.nhbc.co.uk/StandardsPlus.

COMMERCIAL BUILDING CONTROL

NHBC's Building Control Service is also available for non-residential buildings. This may be helpful if you are developing a school or community building as part of your site.

Dealing with NHBC makes the building control process simpler. NHBC offers the following support:

- Free advice and visit to your office.
- Dedicated surveyor contact.
- Experience of alternative solutions.
- Quick turnaround of email queries and approvals.

Recent projects include new buildings, as well as fit-outs and alterations to existing properties.

NHBC provides Building Control Services across all sectors and can assist with mixed-use or stand-alone non-residential buildings. NHBC is already working with some of the UK's largest blue chip companies and could help you too.

For more information, please contact 0844 633 1000 or email jgreenhalgh@nhbc.co.uk.



CUSTOMER SATISFACTION SURVEYS

Back in 2004, and in response to the Barker Review, NHBC teamed up with the Home Builders Federation to design and implement the National New Homes Customer Satisfaction Survey. Targeted improvements by the industry, as a result of this satisfaction data, have resulted in year-on-year improvements, and the number of house builders scoring a five-star rating has risen from one in the first year of the survey to an impressive 13 out of the 16 builders last year.

Response rates achieved are way above those seen in most other market research activity, which shows the level of importance homeowners place on the purchase of their new home.

Major new improvements to the online reporting tools mean that the reports are now easier than ever to use, and house builders can interrogate and drill down into the satisfaction results to understand more about their customers' experience.

Many builders are also choosing to add customised questions to the survey to find out even more about their performance, and this is a really cost-effective way of undertaking bespoke customer satisfaction surveys.

To find out more about how the customer satisfaction survey can benefit your business and to start using the new reports, contact **Toby Phillips** on **07841 784213**.



BUILDING FOR TOMORROW (BfT) 2014

Ahead of further information and an agenda being published in the autumn, NHBC is pleased to announce the dates for next year's Bft seminars.

With a number of upcoming changes to regulations, we are delighted to confirm that representatives of the Department for Communities and Local Government will be speaking at this year's seminars.

| Date | Region | Venue |
|----------------------|------------------|----------------------------------------|
| Thursday 27 February | South | Shendish Manor, Hemel Hempstead |
| Thursday 6 March | North East | Wetherby Racecourse, Wetherby |
| Tuesday 11 March | North West | Thistle Haydock Hotel, Haydock |
| Thursday 13 March | East | Cambridge Belfry, Cambourne |
| Tuesday 18 March | West | National Motorcycle Museum, Birmingham |
| Thursday 20 March | Scotland | Westerwood Hotel, Cumbernauld |
| Tuesday 25 March | South West | The Hilton, Swindon |
| Thursday 27 March | Northern Ireland | Hilton Templepatrick, Belfast |
| Thursday 3 April | South East | Sandown Park Racecourse, Esher |

PART L AND F TESTING SERVICES FROM NHBC

NHBC has joined forces with BSRIA, an organisation with over 50 years' experience supporting and advising the construction industry on energy and water efficiency, and best practice in construction and the effective operation of buildings.

One of the benefits of the new partnership is that Part F testing of fixed fans can be undertaken at the same time as your air leakage test.

To find out more or order tests, contact 'Sales' on 0844 633 1000.



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 Extranet at: www.nhbc.co.uk/builders/NHBCExtranet

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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