

Standards

36

Extra

September 2006

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Heated debate about multi-foil insulations



Cut-away picture of a multi-foil insulation material showing the layers

Multi-foil insulations consist of a number of foil layers separated by other materials. The layers are then stitched through to form a quilt-like sheet, the sheet being supplied in roll form. There are a number of multi-foils on the market and the manufacturers' claims can be very impressive. A multi-foil quilt 25 to 30mm thick, but equivalent in thermal performance to 200mm of mineral wool, appears to be an attractive simple solution when insulating the sloping ceiling of a room-in-the-roof.

We are aware that there is a debate between various manufacturers and testing organisations over the performance of these materials. It is suggested that their performance is far below the manufacturers' claims. The BBA website (www.bbacerts.co.uk) has a useful summary.

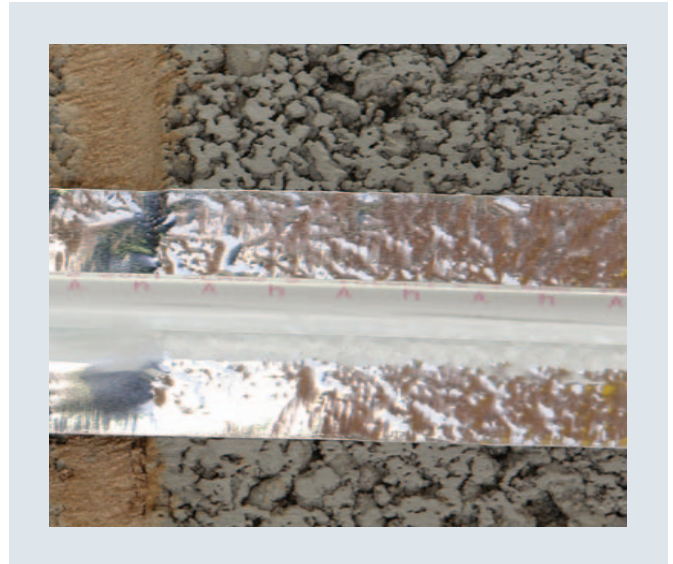
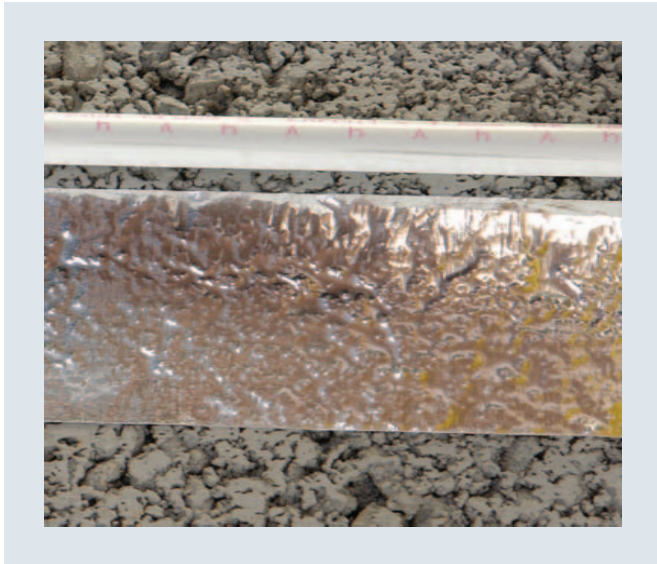
So where does NHBC sit in this debate? Whether or not these materials do have such a good thermal performance is something that will emerge over the next few weeks and months when a consensus is reached on how the performance should be measured. In the meantime, NHBC has decided to err on the side of caution in order to prevent the possibility of homes being built with thermal performance, which falls short of expectations.

Consequently, we will not accept any multi-foil insulations until the situation becomes clearer.

ACTION

Note the restriction on multi-foil insulations. If in doubt over specific materials check with NHBC Technical.

Identifying plastic pipes



Images courtesy of Hepworth Building Products

One of the changes made to Chapter 8.1 'Internal services' this year is that pipes behind wall surfaces should be identifiable with a detector so that they are not damaged by DIY, etc. This change became effective for homes whose foundations are concreted on or after 1 September 2006.

In Standards Extra 35 (May 2006), we suggested that plastic pipes could be 'wrapped' in a metallic tape but there are other ways of satisfying the Standard. These include:

- applying adhesive metallic tape to the face of the pipe (check with the manufacturer that the adhesive will not have an adverse effect on the pipe)
- applying adhesive metallic tape to the surface of the wall as close to the pipe as is practicable
- lightly crimping non-adhesive metallic tape to the face of the pipe to hold it in place.

ACTION Ensure that homeowners are able to identify pipework with a detector to avoid accidental damage.

Show some restraint

In Technical we are often asked when should lateral restraint be provided to separating and gable walls. Lateral restraint is required at:

- each floor
- rafter level, and
- ceiling level unless the gables are small.

Guidance on when lateral restraint is required and the methods of providing it is given in

- Approved Document A for England & Wales, and
- Technical Booklet D for Northern Ireland.

In Scotland the Technical Handbook Domestic Section 1.1 refers to BS 5628-1 'Code of practice for the use of masonry'.

In three storey houses where floor joists are built into the walls

Approved Document A and Technical Booklet D both require restraint strapping at each floor level (unless the wall is tightly sandwiched between floors at the same level on both sides of the wall). BS 5628-1 does not call for strapping, provided the joists are built into the wall at least 90mm. However, restraint strapping at each floor level cannot be omitted in England and Wales or Northern Ireland unless the masonry wall design is justified by an Engineer.

ACTION In three storey houses lateral restraint should be provided as shown in Approved Document A in England and Wales and Technical Booklet D in Northern Ireland, and not what is shown in BS 5628-1. In Scotland follow the requirements of the Scottish Building Standards.

Access to roof spaces

What goes up, must come down!

Our inspection staff have noticed an increase in heating and ventilating equipment being installed in roof spaces. These packages can be large and heavy. It is important that the structure is designed accordingly and that the packages are suitably protected from frost.

At some point in the life of the building the unit will have to be replaced and it is important that it can be removed - usually through the loft hatch - without too much trouble. Removal may be necessary because the roof construction, probably trussed rafters, has only been designed to take the load from one piece of equipment, not two.

NHBC Standards already have requirements for the minimum size of the loft access but this is for persons and does not take account of getting larger pieces of equipment out.

Recently, our Standards Committee agreed changes to our Standards to ensure that openings into lofts are large enough to remove any equipment up there (except for water cisterns that can easily be cut into pieces for removal).



Although the formal changes won't be published until 2007, in the meantime it is logical to make the opening large enough to allow for the removal of any equipment that has been installed in the roof space.

ACTION

If you install equipment in roof spaces, make sure that you allow for its eventual removal.

Roof spaces - To ventilate or not?

The use of vapour permeable underlays has grown significantly in recent years and has now overtaken the more traditional type IF felt in the new homes market.

Many products have been marketed on the basis that the roof 'breathes' through the underlay and therefore eaves ventilation is not required.

To work properly, any moisture vapour entering the roof space from the rooms below needs to be able to pass to the outside around the gaps in the tiles. If the amount of moisture vapour exceeds what can pass through the underlay, then problems can occur - usually condensation forming on the underside of the underlay and dripping onto the ceiling insulation.

Recent research by BRE has shown that condensation is likely to occur early in the life of the home when it is drying out. The amount of warm moist air passing into the roof space can overwhelm the underlay.

The BRE research has been taken into account by the British Standards committee revising BS 5250 'Code of practice for

the control of condensation in buildings'. The recently published revision now recommends ridge or high level ventilation in roofs with vapour permeable underlay, classified as 'type LR', equivalent to a slot of 5mm running the whole length of the ridge.

NHBC considers this to be a good way of avoiding condensation problems in roof spaces and our Standards Committee has recently approved a change to Chapter 7.2 'Pitched roofs' to require ventilation in all pitched roofs, whether they incorporate a vapour permeable underlay or not. This change will be one of the 2007 amendments to the Standards but we would encourage builders to adopt it as good practice straight away.

ACTION

If you are using vapour permeable underlay, consider adding ridge or high level ventilation to avoid potential condensation problems in the drying out period of the home.

Roof tile fixings



Knowing what the correct fixing specification is for a given tile on a given site in Northampton, for example, has never been easy.

However, you should now be able to establish the fixing requirements with the help of the 'Zonal Method' which has been developed by members of the Concrete Tile Manufacturers Association, the Clay Roof Tile Council and the National Federation of Roofing Contractors.

Each tile manufacturer, in producing a data sheet for their various tile designs, has done the hard work. It is now easy to establish what the right fixings should be, provided that you know the manufacturer's name and type of tile, the height above sea level, the headlap, the roof pitch and ridge height and the local wind speed (using the zonal map of the UK). It is then just a case of reading off the correct fixing specification.

The accompanying 'Users' Guide to the 'Zonal Method' also gives advice on the fixing requirements for hips, hip-ridges, ridges, verges, valley junctions, penetrations and openings.

Using the 'Zonal Method' avoids having to do complicated calculations. The resultant specifications comply with the

recommendations of BS 5534 'Code of practice for slating and tiling'.

NHBC is happy to accept this method of establishing roof tile fixings and we believe that it will help avoid problems. Further information should be available from the individual tile manufacturer.

ACTION

Ensure that roof coverings are correctly fixed taking account of the tile being used and the location of the building.



Showery outlook

This is not the first time that Standards Extra has carried articles about showers. In this edition we are looking at two aspects: firstly, the type of glass used in doors and screens and secondly making sure the shower is watertight.

Looking for safety

For obvious reasons glass used in shower screens and side panels should be safety glass and meet the requirements of BS 6206. Building Regulations also describe other locations where safety glazing is required e.g. glazing within 800mm of finished floor level, glazing in doors and adjoining glazed screens.

To assist identification all safety glass should be clearly marked. Under BS 6206 markings should identify the supplier, the type of glass e.g. toughened or laminated and the impact performance of the glass e.g. class 'A', 'B' or 'C', with 'A' being the highest grade. Glass used in shower areas should meet at least class 'C'.

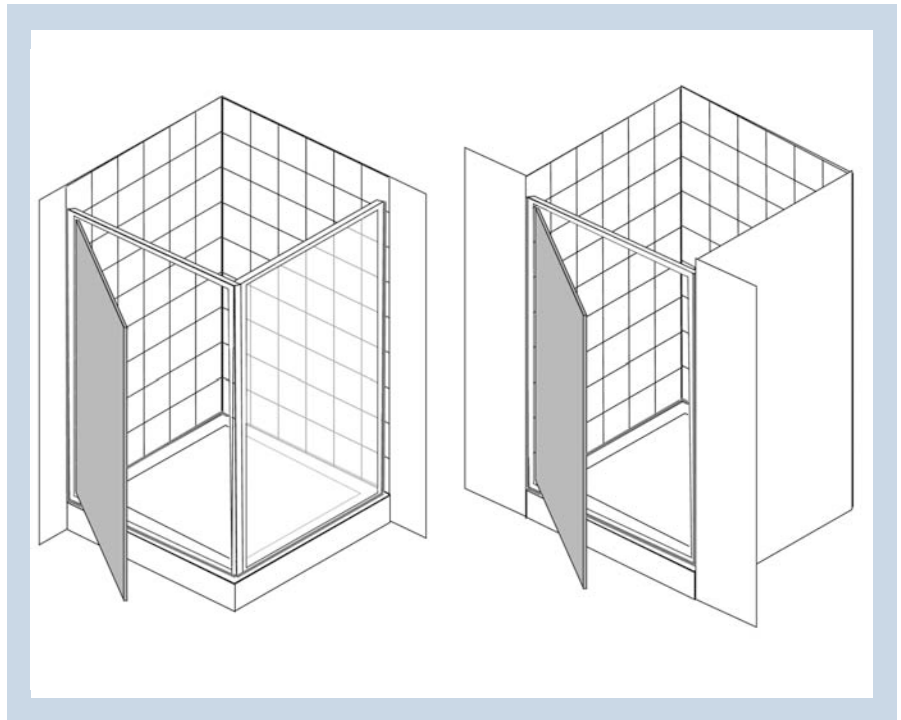
However, BS 6206 is being replaced by a new safety glass test standard BS EN 12600. Under this new standard impact performance grades are given as numbers i.e. 1, 2 and 3 which for comparison purposes are equivalent to 'A', 'B' or 'C' respectively in BS 6206.

A testing time!

Testing for leaks is something the house-building industry is used to.

Builders are required to test drains to ensure they're watertight and won't cause a health hazard. Water services are checked for leaks before they're covered up. And soil and vent pipes are tested to avoid nasty smells in the house. All of these tests are done before handover.

But how many housebuilders do a water test on the shower cubicle? It is just as important that they don't leak, otherwise carpets and other floor finishes can quickly become saturated and ceilings of rooms below stained, and in the longer term the timber flooring and joists may rot.



Showers enclosures may have to withstand water under pressure and plenty of it. Let's start with the wall tiling: grouting should be complete with joints fully filled. Use the right adhesive and grout, usually water resisting, and apply it in accordance with the manufacturer's recommendations.

Joints between ceramic tiles are a potential leakage path, so consider using panel wall finishes which have fewer joints.

Another source of leakage is at the junction of the shower tray with the wall finish and the abutment of the doorframe or enclosure with the walls. All of these junctions should be sealed with an appropriate silicone sealant to prevent water getting past. Allow the sealant to cure for 24 hours before getting someone to use the showerhead to play water onto the

joints to check that they don't leak.

The shower enclosure jointing may look perfect but water has a knack of seeking out the weaknesses and it certainly won't take long for water to come through. It is essential to find this out before the homeowner takes the first shower and steps out onto a wet carpet!

ACTION

Whether safety glass is supplied to BS 6206 or BS EN 12600 it should be clearly marked to identify the supplier, the type of glass and its impact performance classification. Ensure that shower enclosures are sealed in accordance with the manufacturer's recommendations and don't leak.

Helping rain to drain

Heat waves or prolonged periods of drought followed by intense rainfall can cause localised flash flooding. In the event of extreme rainfall, the capacities of sewers, covered watercourses and other drainage systems can be tested to their limits. If drainage capacity is exceeded surface flooding may occur. The excess water (exceedance flow) is conveyed above ground, and will travel along streets and paths, between and through buildings and across open space along the path of least resistance. Indiscriminate flooding of property can occur when this flow of water is not controlled. This is especially problematic where the drain is a combined sewer and sewage flooding can result.

Experience has shown that much of the recorded flooding in urban areas is attributable to the passage of above ground surface flow. However, much can be done to mitigate the effects if surface flood flow is managed proactively. Recognising the importance of flood pathways along highways and other routes, and the storage of water in low spots, is the first step to better management.



Through good design, a second important step is to direct flood flows along routes where the risk to health and safety is minimal.

CIRIA's new guidance 'Designing for exceedance in urban drainage - good practice (C635)', prepared with support from NHBC, provides advice for the design and management of urban sewerage and drainage systems to reduce the impacts that arise when flows occur that exceed their capacity and explains how systems can be designed to safely and sustainably

accommodate excess water during extreme weather events. It aims to improve engineers', planners' and designers' appreciation of the risks associated with urban drainage systems and how these risks may be mitigated.

'Designing for exceedance in urban drainage - good practice (C635)' is available from CIRIA at a special rate for NHBC registered builders of £75 (quoting ref. NHBC). Order by phone 020 7549 3300, fax 020 7253 0523 or post CIRIA, Classic House, 174-180 Old Street, London, EC1V 9BP

Professional subscribers - keeping up-to-date

Now that NHBC Standards is published annually, the Standards updating service for NHBC's 'Professional subscriber list has been discontinued.

If you are on NHBC's 'Professional subscriber' list and wish to receive the annual edition of the Standards, together with three issues of Standards Extra each year, please complete and return the enclosed order form as soon as possible. You will be invoiced for payment in April 2007.

Note: NHBC registered builders and developers will automatically receive copies of both the Standards and Standards Extra.



Five New Robust Details

In Standards Extra 33, Dave Baker, Chief Executive of Robust Details Ltd. (RDL) provided feedback on how RDL got on in its first year in England and Wales. RDL have now been monitoring the performance of registered plots for over 18 months. Also a further five new robust details have been added to the Handbook. Phil Rogers, RDL Technical Advisor, brings us up to speed.

RDL have continued to receive tremendous support from the industry as the alternative to pre-completion acoustic testing. By the end of April 2006 plot registrations had exceeded 200,000 and the ongoing performance and monitoring continues to provide encouraging results.

In last year's article Dave Baker highlighted the importance of the performance and monitoring undertaken by RDL: after all, the long-term success of the RD Scheme will be measured by how plots registered with RDL perform and how RDL manages any issues identified with performance.

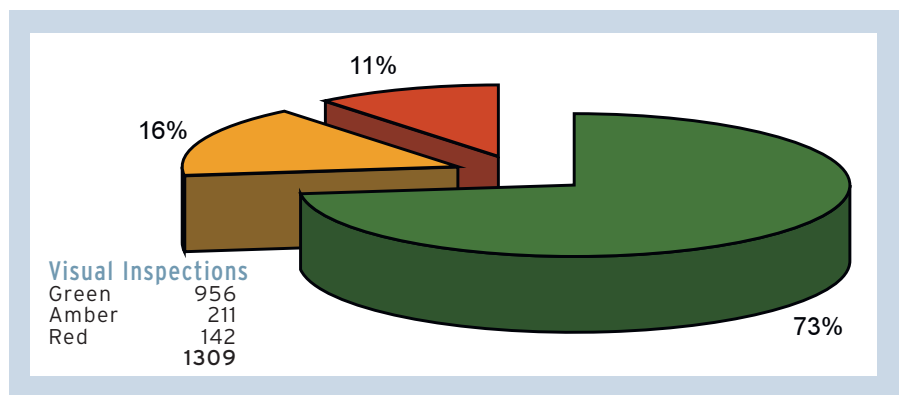
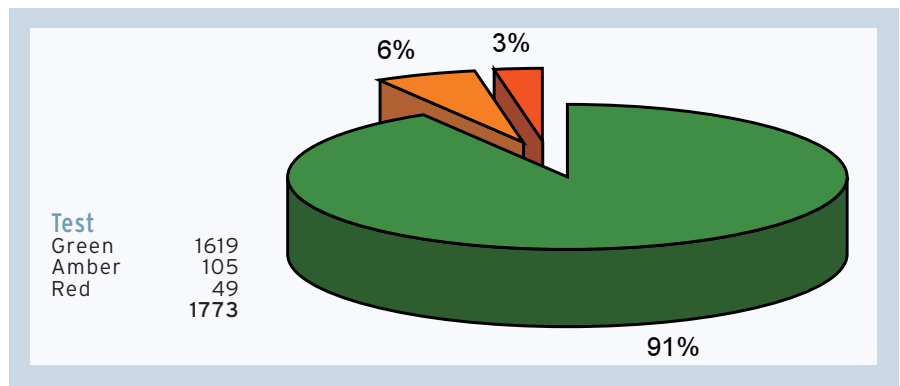
These two charts show the monitored performance of the robust details and highlights the very high levels of compliance seen by the acoustic consultants employed by RDL, the "Inspectorate".

Red indicates monitored performance below that required by Approved Document E (ADE) or a visual inspection likely to lead to inadequate performance.

Amber indicates a test result above ADE requirements but below the higher standards set by RDL. It should be noted that those visual inspections classified as amber indicate minor levels of non-compliance when compared against the published robust details, which may be easily remedied and would not be likely to result in a level of performance below that required by ADE.

Green indicates conformity to the higher standards set by RDL.

One of the benefits of the Robust Details scheme is that it provides feedback to industry. The results of the performance and monitoring described above are reviewed by RDL and from this we are able to inform the industry of areas they should be concentrating on.



In the latest review the following areas were identified as potentially having an adverse effect on the performance of the separating walls and floors:

- the base of cavity masonry separating walls being bridged by excessive mortar
- forming the junction between floating screeds and walls, wall linings and skirting boards.

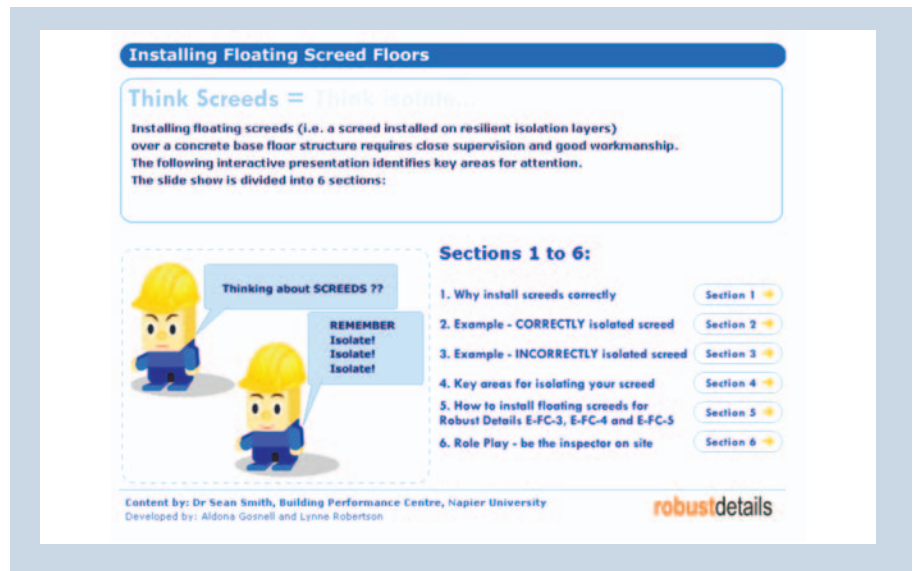
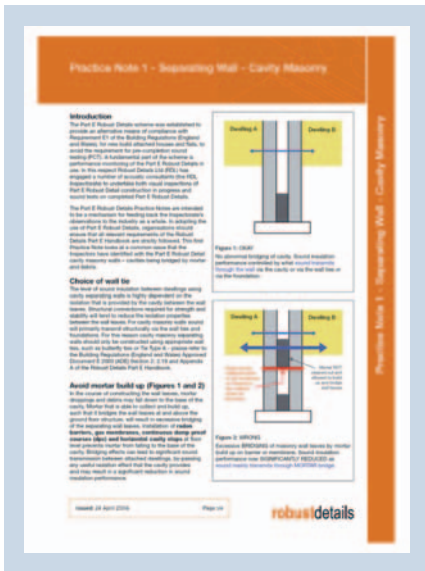
The base of cavity masonry separating walls being bridged by excessive mortar

RDL have produced the first, in what is hoped will be a series of, practice notes highlighting some of the issues with cavity masonry separating wall constructions. This first practice note

looks at common issues that the Inspectors have identified with the Part E Robust Detail cavity masonry walls - cavities being bridged by mortar and debris and also covers topics such as:

- choice of wall tie
- avoiding mortar build up
- examples of good practice
- correct installation of radon barriers, gas membranes, continuous damp proof courses (dpc) and horizontal cavity stops
- recommendations for improved site practice.

The Practice Note is available to view and download from the Robust Details website www.robustdetail.com.



Forming the junction between floating screeds and walls, wall linings and skirting.

Where the performance of floating screed separating floors failed to meet that expected by RDL it was quickly established that in most cases this was a result of incorrect construction of the important junction between the screed and wall, wall linings and skirting.

Inspectors have identified the following three potential causes for the flanking construction to significantly affect performance:

- isolating edge strip(s) not installed
- isolating edge strip(s) installed but cut off by subsequent trades such that no separating material has been provided between screed and wall lining/skirting
- isolating edge strip(s) installed but of insufficient length to ensure separation maintained between screed and wall/wall lining or skirting.

To address this issue RDL have highlighted the importance of this area to all parties that register these separating floors. We have also developed an interactive training aid, freely available from the robust details website www.robustdetails.com.

In addition to showing why it is important to isolate floating screeds and taking you through good and bad examples, you can play the role of an RDL Inspector and see if you can spot the mistakes?

Modified beam and block separating floors

In March 2006 RDL added two new robust details for beam and block separating floors to the Part E Handbook. It would perhaps be helpful to highlight some of the key differences between these robust details and traditional beam and block floors or the other concrete robust detail separating floors published in the Robust Details Handbook:

- a 50mm concrete topping is required across the floor blocks
- precast concrete edge beams or in-situ concrete downstands must be installed to all perimeter (flanking) walls to break the continuity between upper and lower storey walls
- these beam and block separating floors must be used in conjunction with dense aggregate block flanking walls, the use of lightweight aggregate or aircrete block flanking walls would not meet the requirements of the published robust detail
- the E-FC-7 robust detail shows a slight variance within the floating floor treatments (FFT) when compared to the previously published robust details. For example, whilst FFT1 and FFT3 require a 20mm screed, this is not required for FFT2. However, FFT2 does require a 25mm mineral fibre quilt (min 10kg/m³) between the battens
- mineral fibre quilt must be incorporated within the ceiling

void and this must cover the whole ceiling board area.

Full information, including the acceptable combinations for these floors with robust detail separating walls, is included in the Robust Details Part E Handbook. These latest updates were issued to owners of all Handbooks purchased since September 2005 and who have signed up to the subscription service.

Can you help with the next generation of Robust Details?

The original Robust Details Part E Handbook was launched in May 2004 and contained 14 details; by March 2006 the number of details published in the Handbook had risen to 23.

Not all forms of construction that could be tested and pass a pre-completion test would be considered 'robust' enough to become a robust detail. RDL are however, keen to expand the contents of the Part E Handbook to include as many suitable solutions as possible.

Indeed, if you are a builder and are regularly testing forms of construction on site you may already have sufficient test evidence to submit a 'Stage A' application for a candidate robust detail. If this applies to you RDL would be keen to hear from you. Please feel free to call RDL's Technical Advisors, to discuss this further on 0870 240 8209. Alternatively send a brief email to technical@robustdetails.com, describing your proposals and we will get back in touch with you.

Gas in flats

The Institution of Gas Engineers and Managers (IGEM) will be running two seminars in November to launch their revised publication IGE/G/5 'Gas installations in flats and other multi-dwelling buildings'.

The seminars will be of interest to builders and developers as well as architects, surveyors and services engineers who work for them.

The seminars are on 8 November in Edinburgh and 14 November in Birmingham. Details are available at www.igem.org.uk. A 5% discount is available for NHBC registered builders and professional subscribers for which you will need to give your registration number and 'NHBC' on the application form.



Cast stone standards



Cast stone details such as porticos, window heads and cills, string courses and quoins can make a property stand out and, as the picture shows, transform something plain into something special.

However, as with any building material performing a critical function, it's important to choose one that meets with a British or European Standard. According to the UK Cast Stone Association (UKCSA), there are around

160 cast stone manufacturers in Britain. Some of them operate without adequate quality assurance or testing regimes and may not be working to proper standards.

To reduce the risk of problems associated with poor product performance and site handling, always check that your cast stone is made to the relevant British Standard, BS 1217.

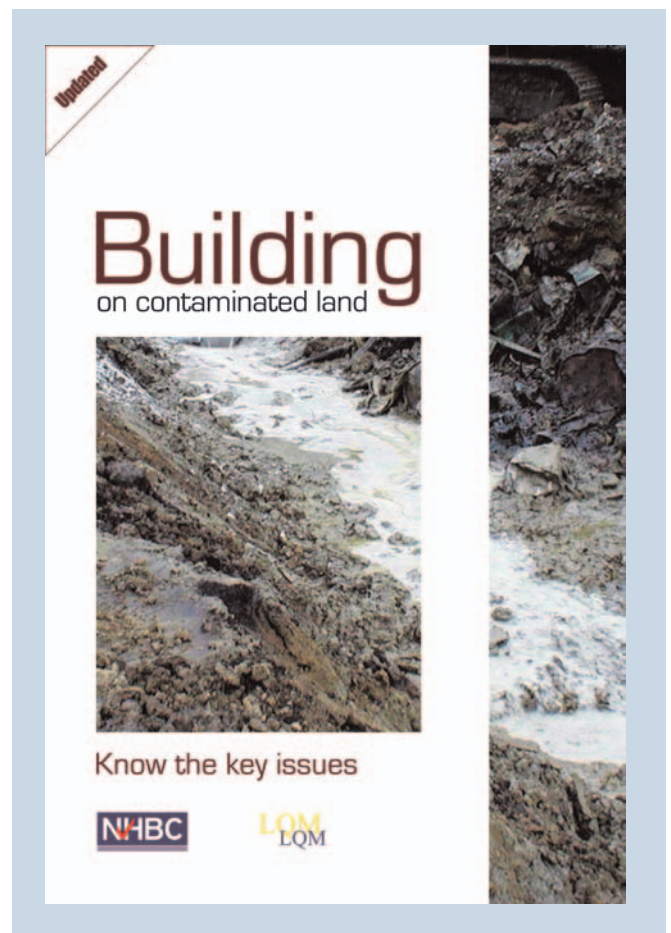
UKCSA members manufacture products to a standard in excess of BS 1217 and go

through a strict vetting procedure. Visit www.ukcsa.co.uk for their names, and specification for the design, manufacture, handling and installation of cast stone. A free 28 page technical manual is also available.

ACTION

When specifying or using cast stone, ensure it's produced to BS 1217 or, better still, the higher standard adopted by UKCSA members.

NHBC Training



House builders may be interested in the following courses from NHBC.

The changes to Approved Documents Parts F and L came into effect in April. With an increased focus on energy efficiency the changes will have a significant impact on house builders. There are several new aspects to consider when complying with the new parts including a computer-based assessment of the design.

The half-day seminar 'Approved Documents Parts F and L explained' will equip house builders with the knowledge they need to put into operation the new regulations.

House building on contaminated land is a very topical subject at the moment. With 72% of all new housing currently being built on brownfield sites and targets possibly increasing to 75%, the need for developing contaminated land has never been greater. Rising land costs and increasing legislation means that builders need to ensure they are getting value for money.

NHBC has teamed up with LQM for the fourth time to provide the one-day course 'House Building on Contaminated Land'. The course has been designed around a case study allowing delegates to put knowledge

learnt straight into practice. By putting the issues into context it will help familiarise builders with the recent and forthcoming regulatory, legal and technical developments relating to the regeneration of potentially contaminated land.

Both these courses are being run regionally and on various dates throughout October and November. For further information or to make a booking please contact Louise Heal on 0870 241 4323 or email lheal@nhbc.co.uk

Q

Field drainage systems to septic tanks and small private sewage treatment plants

Are coiled flexible internally ribbed plastic land drains suitable for use in the field drainage from a septic tank or a small private sewage treatment plant?

A

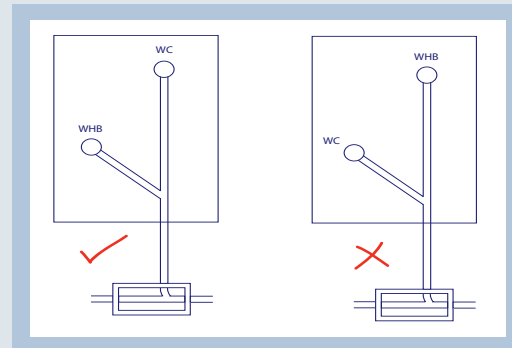
- NHBC Standards clause 5.3 - D8(e) refers to field drains for the disposal of the discharge from septic tanks
- small solid particles in the discharge from septic tanks and treatment plants can over time accumulate on ribbed pipe surfaces and cause blockages
- pipes should be laid to a uniform gradient. Dips in flexible pipes can cause settlement of solid particles and potential blockages
- manufacturers of septic tanks and small treatment plants do not recommend the use of flexible plastic land drains to form the drainage field from their units.

The field drain from a septic tank or small private sewage treatment plant should be formed with rigid perforated pipes (rigid plastic or clay) having a smooth inner surface. Pipes should be laid to uniform falls.

Coiled ribbed plastic land drains are not suitable for this purpose.

the building using a 'Y' junction. Each drain should run to an access point outside the building. This access point will enable each length of the drain under the building to be rodded without the need to enter the building.

Where installed, a drain serving solely a wash hand basin that connects via a 'Y' junction under the building into another drain will be accepted.



Q

'Y' junctions in drains under buildings

Is it acceptable to have a 'Y' junction on a drain under a building?

A

- NHBC Standards clause 5.3 - D3(a) refers to BS EN 752 for guidance on drainage design
- BS EN 752 : 3 'Drains and sewer systems outside building - planning', says 'Every drain and sewer length should be accessible for maintenance and cleaning without the need to enter the building'
- access to 'Y' branches from upstream may be difficult or impossible to achieve and it is generally unacceptable to require the removal of sanitary fittings within the building to clear a blockage
- experience has shown that the risk of a blockage occurring in a drain run serving solely a wash hand basin is low.

With the exception given below, a drain serving a foul appliance should not be connected into another drain under

Q

Minimum foundation depths in clay soils

In clay soils where there is no influence from trees or shrubs and the final ground level is to be raised, what is the minimum foundation depth, and from where should it be measured?

A

Foundations should not bear onto clay soils, if they are affected by seasonal desiccation, which could result in movement. Seasonal desiccation can cause movement to a depth of 1.0m in high, 0.9m in medium and 0.75m in low volume change potential soils [NHBC Standards clause 4.4 - D8 (a) and S5].

Minimum depths for foundations on clay soils are as follows:

| Volume change potential | Minimum depth (m) |
|-------------------------|-------------------|
| High | 1.0 |
| Medium | 0.9 |
| Low | 0.75 |

The depth should be measured from:

- the original ground level where seasonal desiccation of the soil is either unknown or is known to be present
- the raised ground level where it is shown by recent tests that the original ground is not desiccated, providing that the foundations are on a good bearing and do not bear onto any fill or topsoil.