

Foundation facts

News from the NHBC Foundation ■ Spring 2016



Celebrating 10 years A decade of housing research

**Welcome by Rt. Hon. Nick Raynsford
Chairman, NHBC Foundation**

When I was asked in 2006 to chair the newly established NHBC Foundation, it was agreed that the priority should be to deliver useful, practical guidance of real value to the industry. I was determined that we should not become just another 'talking shop'. Ten years on, I am delighted that we have delivered more than 80 high quality, relevant and useful reports and guides.

The ten years seem to have flown by, but it is interesting to reflect on what has changed during the period, for example:

“The NHBC Foundation produces some of the most practical and relevant research we get. It’s from the sector, for the sector, and we are all the better for it.”

Rob Perrins, Managing Director of the Berkeley Group plc

“NHBC Foundation’s wide-ranging reports are essential reading, helping builders like Barratt to address some of the key challenges in house building.”

David Thomas, Group Chief Executive of Barratt Developments plc

Sustainability and zero carbon

In the year we launched the Foundation, the Labour government gave a clear commitment to the sustainability and zero carbon agendas with the Code for Sustainable Homes and the announcement of the transition programme to zero carbon new homes. Many of our NHBC Foundation projects focussed on these important topics, aiming to help the industry understand how best to address the challenge, and reviewing consumer reaction and feedback on how technologies were performing. Although the present government has wound back the zero carbon ambition for the time being, our research in these areas has helped the industry achieve real advances and will doubtless be useful in informing future policy.

In and out of recession

During our ten years, we have seen house-building numbers peak at 233,000, decline to a low of 117,000 and recover to 177,000. Research we published in 2014 shows that this period has been particularly difficult for smaller house builders and developers, with the number of such companies declining from 12,000 in the late 1980’s to just 2,700 in 2013. Many of our Foundation projects have been aimed at supporting this sector with technical guidance to help them comply with the more detailed aspects of

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regulation. We have monitored these impacts, and later this year we will be carrying out a survey of smaller builders and developers, following up the previous exercise of 2014.

Modern methods of construction

The Foundation's first report, *A guide to modern methods of construction*, published in 2006 looked into alternative construction methods. A shortage of housing supply, skills shortages and concerns about housing quality were all seen as issues then, driving the industry to explore alternatives to established cavity brick and block construction. There was certainly a flurry of activity around that time, but this slowed down during the recession. Interest in modern methods of construction is now firmly back on the agenda and a report we will publish this summer tells us that 45% of respondents believe that modern methods of construction will be playing an increasing role. It is interesting to note that this is aimed at addressing the very same issues identified ten years ago.

Throughout our ten years we have worked with a diverse variety of research partners, whose input has been essential to the many high quality, useful and pragmatic reports that we have published. We have established excellent relationships and are grateful for the energy, enthusiasm and expertise our partners have brought to the work of the NHBC Foundation. It is testament to the quality of our work that certain reports have been quoted in government consultation papers, called up in Approved Documents to the Building Regulations and spoken about in Parliament.

Now that we are firmly established, we can look forward to the next ten years and it will be interesting to see the challenges that emerge. One project that will be of particular interest is a 'house-building futurology' study seeking to predict what new homes will be like in 2050. Of course making accurate predictions over that length of time is almost impossible, but it is important to help the industry think about some of the likely challenges and drivers it will face in the years ahead.

Finally, I would like to extend my sincere thanks to the members of the Expert Panel who help guide the activity of the NHBC Foundation, providing insight and stimulus from their varied perspectives. Their expertise is an invaluable ingredient in our success.



Rt. Hon. Nick Raynsford
Chairman, NHBC Foundation

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Foundation Focus is sent out every month, so to make sure you get your copy, please register through the website.

www.nhbcfoundation.org



The connected home: designing and building technology into today's new homes (NF67)

Developments in wireless home networks, superfast broadband and the rapid growth in smartphones and tablets have combined to open up a wide range of useful 'smart' home technologies. These are already impacting everyday life for many of us and they will undoubtedly continue to grow.

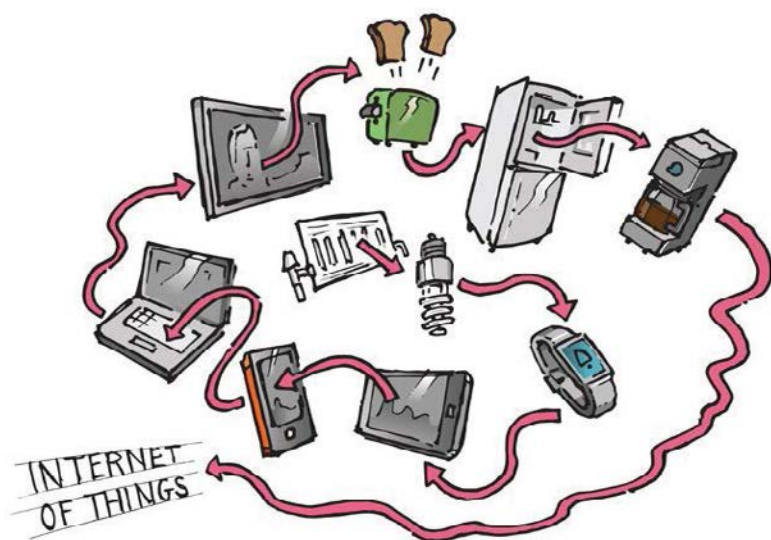
For this guide, we worked closely with CEDIA (the international trade association of companies that specialise in designing and installing electronic systems for the home) to explore these technologies. The guide describes technologies for home working, voice and video telecommunications, home entertainment and heating system controls. But of particular interest are those technologies which are aimed at 'assisted living' and will help our ageing population to live independently at home.

Research shows that people tend to live longer, happier lives when they are in the familiar environment of their own home and many companies are competing to serve this sector of the population. Alarm call facilities are already common but additionally, connected devices with sensors able to monitor activity levels, heart rate and sleeping patterns and send an alarm to family members or the doctor if all is not well, are becoming available.

The report looks at those technologies already available for use today, as well as those that are on the horizon. It is clear that with an estimated 26 billion devices expected to be on

the 'Internet of Things' by 2020, domestic life will be changing. There will be devices that make material improvements to our lives and wellbeing, together with many more frivolous things, such as a fridge that orders more milk, the coffee machine that starts brewing as your car nears home or the cupboard that senses your weight before allowing you access to the biscuits!

One of the key messages from the report is that WiFi cannot be relied upon for all the connected technologies we expect homes to have. For these to work together well, a small amount of additional cabling installed during the construction can go a long way towards future-proofing new homes. For example, Ultra High Definition or '4K' TV is now superseding High Definition TV, but it requires more bandwidth and works more reliably if connected to the home network with a fixed cable. Providing some extra cabling can also help to deal with wireless signal congestion and dead spots that can occur in larger homes and/or homes with steel-framed partitions.



Home comforts: guidance on using ventilation, heating and renewable energy systems (NF68)

New homes feature a range of energy and ventilation systems. For these to provide good levels of comfort, and for residents to realise the energy-saving benefits that these systems offer, they must be operated correctly.

In practice, many people fail to understand how to operate even well-established devices such as wall thermostats, and it's not surprising that the newer technologies, such as heat pumps and mechanical ventilation, cause much uncertainty and head scratching. All too often, these systems are used inefficiently, resulting in poor or disappointing performance.

To encourage better understanding and use, this recent guide, developed by services experts and with content reviewed by resident groups and manufacturers, provides guidance for residents on the operation and maintenance of the following systems:

Ventilation

- Natural ventilation
- Mechanical extract ventilation
- Mechanical ventilation with heat recovery

Solar energy systems

- Solar PV
- Solar thermal

Heat pumps

- Air source heat pumps
- Ground source heat pumps

Heating controls

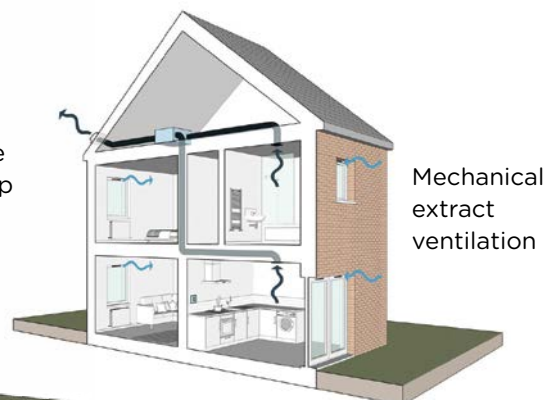
- Single-zone heating controls
- Multiple-zone heating controls

NF68, also integrated into the NHBC Home User Guide (HUG)*, uses 3D graphics and tables to explain these systems, and provides practical, straightforward guidance and useful tips on using them effectively. All the content, including high resolution versions of the graphics, may be freely downloaded by house builders and housing providers to support the effective use of particular systems included in their designs.

*www.nhbc.co.uk/Productsandservices/HomeUserGuide/



Air source heat pump



Mechanical extract ventilation

Part L 2014 - where to start: an introduction for house builders and designers, for Wales (NF64 and NF65)

NHBC Foundation guidance on meeting the challenges of Part L, first introduced for the 2010 edition, which applied in both England and Wales, was particularly well received by smaller designers and builders. They have a particular challenge in understanding and implementing Approved Document L1A and have less access to specialist technical expertise. Keen to update the guidance to reflect the 2014 changes that apply specifically in Wales, we were pleased to receive the support of the Welsh Government to develop two separate guides – one dealing with masonry construction (NF64), and the other with timber frame (NF65).

Both guides present a range of solutions which comply with Approved Document L1A for a range of typical home types, from a two-bedroom apartment to a large four-bedroom detached house. The current edition of the Approved Document puts much more emphasis on the issue of thermal bridging – the heat loss which occurs at any point of weakness in the thermal insulation, such as around window openings or at the junctions between building elements. Thermal bridging is explained and the guidance shows the extent of the impact of the different construction junctions and the proportion of heat loss associated with each junction, which varies depending on the type of home.

Similar guidance (NF58 and NF59) is also available for the 2013 edition of Approved Document L1A, which applies in England.



Tenure integration in housing developments (NF66)

Back in the 1950s and 60s, when Britain's house building output was at its height, tenure segregation was the norm. In most cases, developments were exclusively for council tenancy or private ownership - separating people of different economic or social status. This approach proved to have a very unhappy outcome, giving rise within a generation to problems of deprivation and social exclusion.

The move towards tenure integration in the last two decades is therefore an understandable and appropriate trend. In this review, based on recent research, the NHBC Foundation offers a series of findings that inform our thinking on tenure integration in modern Britain and how it might be embedded successfully:

1. Mixed tenure is now part of UK life. The research found that mono-tenure developments were no longer included in the strategic objectives of house builders and social landlords
2. Tenure integration is found not to decrease property prices
3. A range of house types and sizes, coupled with good quality design of homes and external spaces, can help stabilise neighbourhoods.

Alongside these positive observations, the review highlighted some challenges. It identified a poor level of research and understanding of the management of mixed-tenure developments and of the increasing impact of private sector renting.



Sustainable technologies: the experience of housing associations (NF63)

Following the introduction of the Code for Sustainable Homes in 2006, the social housing sector has developed a significant portfolio of homes which have incorporated a range of sustainable technologies.



Owning and managing these homes over the years has given housing associations valuable experience in the design, installation and performance of these technologies, including resident satisfaction. This primary research from the NHBC Foundation highlights the technologies that have delivered good levels of satisfaction and those that have fallen short of expectations. The main findings from the research included the following:

- Up front capital costs strongly influenced the choice of technology
- Water efficiency measures are installed four times more often than energy efficiency technologies
- Inadequate installation skills are an issue
- Technologies were perceived as benefiting residents

- Residents could benefit from greater understanding of the technologies in their homes
- Heat pumps are delivering poor levels of satisfaction
- Some infrequently installed technologies have high levels of satisfaction
- The broad use of photovoltaics is likely to continue.

The research also found that beyond looking at utility bills, there has been a relative lack of monitoring of performance of sustainable homes. Additional data obtained through physical monitoring would certainly be useful in confirming good technology choices.

Retirement housing: residents' experiences (NF69)

Retirement housing can be an attractive option for purchasers who no longer want the responsibility of maintaining their family homes. With an additional 2.2 million people in the 65+ age bracket by 2024, the provision of suitable retirement homes is therefore a major opportunity for the house-building sector.

To inform future developments, this report explored residents' views of their retirement housing. Overall the findings were very positive, with 86% of residents saying they loved living in their retirement housing or enjoyed it most of the time, and they cited companionship and community spirit as the biggest benefits. However, across

the six retirement-style developments included in the study, residents did identify a number of features related to the location and design of their homes that could be improved.

The study found that the need to downsize and a desire to live in a 'safe and secure' environment were the

most significant considerations when considering a move to retirement housing. Other factors also had a bearing, including being close to family and having access to support services. These considerations should feature strongly in the marketing and promotion of retirement housing developments.



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

This fully illustrated guide, developed in partnership with Studio Partington, tells the story of British housing since Victorian times. Through photographs, timelines and infographics, it highlights the pivotal events, inspirational people and landmark designs that have shaped our unique housing heritage. *Homes through the decades* also describes the social, political and technological challenges and drivers that have influenced housing in the last 150 years, and defines seven distinct phases:

Mid 1800s-1918 Victorian and Edwardian legacy

A time of concern over public health, Public Health Act sets basic requirements for new homes, private renting the norm.

1919-1939 Between the wars

Homes for heroes, new approach to design, growth of suburbia, dual approach to housing supply established (government-supported council housing and private ownership).

1945-1959 Post-war recovery

Prefabrication used extensively to help with housing shortage, centralised planning and the emergence of New towns.

1960-1979 Towers in the sky

When residential tower blocks were seen as a housing solution, housing output reaches historical high (over 425,000) in 1968.

1980-1999 Technology and society

Right to buy, negative equity, major developments in the regulation of home construction and standards. Housing now predominantly a technical, rather than craft-based industry.

2000-present Embracing sustainability

How the housing industry is responding to sustainability requirements and the drive to reduce carbon emissions from homes.

The future Meeting tomorrow's needs

A consideration of future challenges, particularly how to meet the needs of an ageing population and other anticipated demographic changes such as greater levels of single occupancy.

NF62 provides an authoritative summary of historical successes and lessons and, as well as being a useful introduction for students and practitioners, informs our thinking as we design homes and developments to meet the challenges of the future.



Publications in the pipeline

Modern methods of construction: views from the industry

Explores current engagement with approaches defined under the term modern methods of construction (MMC). Captures recent experience of MMC from house builders and housing associations and their views on its future use for home building in the UK.

Due for publication in **Summer 2016**

Underfloor heating: a guide for house builders

A practical guide, developed in partnership with BSRIA, covering the design, installation and commissioning of underfloor heating in common situations. Includes guidance on controls and testing.

Due for publication in **Summer 2016**



All NHBC Foundation reports can be downloaded free from www.nhbcfoundation.org. If you would like a printed hard copy please email info@nhbcfoundation.org.

Do you have any research ideas?

Get in touch at info@nhbcfoundation.org.

The NHBC Foundation Expert Panel

We are grateful for the continuing support of the NHBC Foundation Expert Panel, which includes the following senior representatives from the industry and government:

- **Rt. Hon. Nick Raynsford**
Chairman of the NHBC Foundation and Expert Panel
- **Jane Briginshaw**
Design and Sustainability Consultant, Jane Briginshaw and Associates
- **Andrew Burke**
Policy Officer, National Housing Federation (retired)
- **Richard Cook**
Head of Residential Development, Lend Lease
- **Claire Curtis-Thomas**
Chief Executive, British Board of Agrément
- **Hywel Davies**
Technical Director, Chartered Institution of Building Services Engineers (CIBSE)
- **Andrew Day**
Director, Architecture, Design & Sustainability - New Homes and Communities, Countryside Properties (UK) Ltd
- **Russell Denness**
Group Chief Executive, Croudace Homes Group
- **Michael Finn**
Design and Technical Director, Barratt Developments plc
- **Cliff Fudge**
Technical Director, H+H UK Ltd
- **Richard Hardy**
Managing Director, BRE Global
- **Richard Harral**
Head of Technical Policy, Building Regulation and Standards Division, Department for Communities and Local Government
- **Richard Hill**
Chief Executive, Spectrum Housing Group
- **Neil Jefferson**
Director, NHBC
- **Rod MacEachrane**
Director, NHBC (retired)
- **Robin Nicholson CBE**
Senior Partner, Cullinan Studio
- **Tadj Oreszczyn**
Director, The Bartlett School of Environment, Energy and Resources
- **Geoff Pearce**
Executive Director of Regeneration and Development, Swan Housing Association
- **Mike Quinton**
Chief Executive, NHBC
- **Helen Saunders**
Group Marketing Director, Crest Nicholson plc
- **Steve Turner**
Head of Communications, Home Builders Federation
- **Andy von Bradsky**
Consultant, PRP
- **Karl Whiteman**
Divisional Managing Director, Berkeley Homes
- **Tony Woodward**
Managing Director, Kinglerlee Homes
- **Neil Smith**
Head of Research and Innovation, NHBC, and Secretary to the Expert Panel



NHBC Foundation,
NHBC House, Davy Avenue, Knowlhill,
Milton Keynes, Bucks MK5 8FP
Tel: 0344 633 1000
Email: info@nhbcfoundation.org
www.nhbcfoundation.org
Twitter: @nhbcfoundation