Approved Document Part L 2013: special edition

Technical Extra

March 2014 | Issue 13

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NHBC

REGULATION AND COMPLIANCE

INTRODUCTION

In July 2013, the Department for Communities and Local Government informed the industry of the revised requirements for Part L 2013 of the Building Regulations 2010 for England. This was followed in December 2013 by the publication of two new Approved Documents (L1A and L2A) and new second-tier documents (the Domestic Building Services Compliance Guide and the Non-domestic Building Services Compliance Guide). The changes to Part L 2013 will come into force on 6 April 2014.

This special edition of *Technical Extra* reviews the changes to the Approved Document L1A (ADL1A), which refers to new dwellings, clarifies any new requirements and identifies sources of guidance on how to meet them.

Whilst the focus of this issue is ADL1A in England, similar requirements for energy efficiency apply in Wales (ADL1A), Scotland (Building Standards Section 6), Northern Ireland (Part F) and the Isle of Man (Part L).

The transitional provisions for Part L 2013 are the same as those used for the introduction of Part L, F and J in 2010, so it is important to understand how these changes will affect your developments and the key dates when these come into effect to allow any sites to meet them.

KEY CHANGES AND TRANSITIONAL PROVISIONS

The key changes to ADL1A for new dwellings, from 6 April 2014, are as follows:

- **Changed:** The Target Emission Rate (TER) is now set approximately 6% lower across the build mix than the previous regulations in 2010. This means that, from April 2014, new homes must be designed to emit 6% less CO_2 using a variety of means, including improving both the building fabric and the efficiency of building services.
- **New:** A fabric energy efficiency standard (FEES) has been introduced. This is the maximum space heating and cooling energy demand for a new home. It is measured as the amount of energy which would normally be needed to maintain comfortable internal temperatures in a home and is measured in kWh/m^{2}yr. Target Fabric Energy Efficiency (TFEE) calculations and Design Fabric Energy Efficiency (DFEE) calculations must be submitted to the Building Control Body (BCB) prior to work starting on site and at completion to reflect the as-built construction.
- **New:** A recipe approach sets a Part L 2013 model specification for the fabric and efficient services which, if followed, will demonstrate compliance with the regulations and meet the TER and TFEE rate.
- **Changed:** The notional dwelling used for the TER and TFEE is based on a concurrent 2013 dwelling specification, the same size and shape as the proposed building, using the model specification described in the recipe.
- **Changed:** The requirement for two space heating zones in homes with wet gas fired heating systems has been removed for homes less than 150m^2. Networked multi-zone systems with wireless TRVs are also included as acceptable methods of controlling heating systems.
- **Changed:** The maximum number of light fittings that can be operated by a single light switch is limited to six, with a maximum total load of 100 circuit watts.

Transitional provisions

The new documents will come into effect on 6 April 2014. However, the requirements will not apply to sites where an initial notice, building notice or full plans submission has been served before 6 April 2014 and work on site commences prior to 6 April 2015.

There are supplementary provisions for cases where an initial notice is given before 6 April 2014 and then varied by an amendment notice given on or after that date. Work added to the scope of the initial notice by such an amendment will be subject to the amended (2013) regulations.

For the avoidance of doubt, the following work constitutes site commencement:

- Excavation for strip or trench foundations or for pad footings.
- Digging out and preparation of ground for raft foundations.
- Vibroflotation (stone columns) piling, boring for piles or pile driving.
- Drainage work specific to the building(s) concerned.

For initial notices that are made in respect of a number of homes on a site; for example, a number of houses, the commencement of work on the first of the buildings within the application will secure all buildings within the scope of the notice that are served before 6 April 2014.

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

Fabric energy efficiency rates

REQUIREMENTS

When Part L 2013 is implemented in April of this year, the industry will need to become familiar with two new terms of Building Regulations vocabulary, the Target Fabric Energy Efficiency (TFEE) rate and the Design Fabric Energy Efficiency (DFEE) rate which have been introduced as a measure of the efficiency of the fabric to new buildings as the next step towards zero carbon.

New regulations have been introduced which require builders and designers to achieve or better the TFEE rate and to notify the BCB, in addition to the TER and dwelling emission rate (DER), the TFEE/DFEE rates before work starts on site. Additionally, the as-built TFEE/DFEE rate should be reported to the BCB at completion. Without this information confirming that the as-built dwelling achieves or betters both the TER and TFEE rate, the BCB will be unable to issue a final certificate.

The TFEE and DFEE rates are derivatives of the Fabric Energy Efficiency Standards (FEES), which were first proposed by the Zero Carbon Hub and adopted by Government as a measure of the amount of energy that would be required to maintain a building at a comfortable internal temperature.

The FEES methodology considers the space heating and cooling demand of a dwelling, and the FEES achieved is affected by:

- building fabric U-values
- thermal bridging
- air permeability
- thermal mass
- external heat gain (solar)
- internal heat gains; for example metabolic activity or as a by-product of services such as lighting.

The introduction of a mandatory target for fabric energy efficiency into Part L 2013 means that the fabric of all new dwellings will need to be sufficiently good to ensure that the heating and cooling demand of the dwelling does not exceed the TFEE rate.

However, having considered the responses to the 2012 consultation on Part L 2013, the Government has relaxed the FEES target by 15%.

This more relaxed target provides greater design flexibility and addresses consultee concerns that full FEES may not currently be achievable by builders across the full range of home types.

The calculated TFEE is therefore multiplied by 1.15, effectively giving a 15% reduction on full FEES.

Buildings containing multiple dwellings

For buildings containing multiple dwellings, it is still permissible to calculate an average TER/DER for the building, but the guidance has been expanded to allow for the exact same methodology to be used to calculate an average TFEE/DFEE rate for the building.

REGULATION AND COMPLIANCE

The recipe approach

REQUIREMENTS

The new TFEE and DFEE rates are an essential part of the 'recipe' approach which has been adopted in the new Part L. The model specification, or recipe, allows home builders to achieve the 6% improvement over Part L 2010 by using good fabric and efficient services and will, if followed, meet both the TER and the new TFEE rate.

The table below illustrates the major components of the recipe. Its full specification can be found in Table 4 ADL1A and Appendix R of SAP.

Opening area	Same as actual up to 25% of floor area
Ext. walls (W/m^2K)	0.18
Party walls (W/m^2K)	0
Floor (W/m^2K)	0.13
Roof (W/m^2K)	0.13
Windows (W/m^2K)	1.4 (g=0.63)
Air tightness ($m^3/hr.m^2$)	5.0
Thermal bridging (W/m^2K)	Calculated using the lengths of junctions in the actual dwelling and the psi values provided in Appendix R
Ventilation type	Natural (with extract fans)
Gas boiler	89.5% (SEDBUK)

As you can see, the recipe sets challenging performance levels for walls, floor and roofs, as well as requiring a reasonably high standard of workmanship to achieve an air leakage level of $5.0m^3/hr.m^2$. External masonry walls could, for instance, increase in width to approximately 350mm to achieve the U-value of 0.18 W/m^2K, and depths of 350mm of glass fibre insulation in the roof void would ensure that the roof achieves the U-value of 0.13 W/m^2K.

The notional dwelling used to determine the CO_2 and fabric energy efficiency target is the same size and shape as the actual dwelling built to the current specification for fabric and services under Part L 2013. The model specification for Part L 2013 has been strengthened to deliver 6% CO_2 savings across the new build mix relative to the Part L 2010 standard.

Limiting fabric parameters	
Element	**Area-weighted average U-value**
Roof	$0.20\ W/m^2K$
Wall	$0.30\ W/m^2K$
Floor	$0.25\ W/m^2K$
Party wall	$0.20\ W/m^2K$
Windows/doors	$2.00\ W/m^2K$
Air tightness	$10\ m^3/hr.m^2$

To guard against poor performance of individual elements, limiting fabric values are retained in ADL1A and limiting building services efficiencies in the Domestic Building Services Compliance Guide. However, just constructing to these 'backstops' would not on its own achieve the TER and TFEE rate.

If the actual dwelling is constructed entirely to the notional dwelling specification for fabric and services, it will meet the CO_2 and fabric energy efficiency targets, and also the individual limiting values for fabric elements and fixed building services.

The challenging targets may not suit all builders and so the recipe is likely to provide a good place to start. As with all recipes, you can play around with it and alter the measures of the ingredients if you wish, providing that you still achieve the targets for emissions and fabric efficiency. The following table shows what could be done for an example end terrace dwelling of $76m^2$ to allow the fabric performance to be relaxed for some thermal elements by improving the fabric performance of others, or by adding compensatory features.

REQUIREMENTS (CONTINUED)

	Column 1	Column 2	Column 3
	Appendix R		
	Elemental recipe	Triple glazing	Relaxed fabric
Ext. walls (W/m²K)	0.18	0.22	0.26
Party walls (W/m²K)	0	0	0
Floor (W/m²K)	0.13	0.16	0.19
Roof (W/m²K)	0.13	0.13	0.13
Windows (W/m²K)	1.4 (g=0.63)	0.9 (g=0.57)	1.4 (g=0.63)
Air tightness (m³/hr.m²)	5.0	5.0	5.0
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)
Services			WWHR
TER ($kgCO_2/m^2.yr$)	18.72	18.72	18.72
DER ($kgCO_2/m^2.yr$)	18.72	18.68	18.67
TFEE (kWh/m².yr)	47.18*1.15=54.26	54.26	54.26
DFEE (kWh/m².yr)	47.18	46.73	54.20

Notes

Column 1

The first column shows the values for the major elements based on the model specification for Part L 2013 or 'recipe'. Note that, because the notional home used is the same size and shape as the home being assessed, the TER and DER are the same. As the TFEE is relaxed by 15%, the original output is multiplied by 1.15 to give a TFEE of 54.26 kWh/m².yr.

Column 2

The second column changes the windows from double glazing to triple glazing and this allows the U-values for the walls and floors to be relaxed from the recipe. You will see that, overall, this still means that the DER and DFEE rate better the TER and TFEE rate.

Column 3

The third column relaxes the U-values to the walls and floor by quite a margin but adds in waste water heat recovery as a compensatory feature. The design still meets the TER and TFEE rate, but you will note that the DFEE rate is far closer to the TFEE rate because of the level of relaxation in the thermal efficiency of the walls and floor.

YOU NEED TO...

- Consider the effect on your house types of the changes in the TER/DER and TFEE/DFEE calculation and the model specification. Modify your designs and specification accordingly so that the DER and DFEE rate are no greater than the TER and TFEE rate respectively.
- Ensure that the TER/DER and TFEE/DFEE calculations and specifications are submitted to the BCB before building work commences on site. Liaising with your energy assessor early in the process will help.
- Be aware that the TER/DER and TFEE/DFEE rates submitted at the design stage may be accepted as the as-built TER/DER and TFEE/DFEE rates, as long as no changes in the specification have been made and the measured air permeability meets the design value.
- Where the specification has changed or the measured air permeability is different from that assumed in the design stage submission, ask the energy assessor to produce an as-built TER/DER and TFEE/DFEE rate and submit it to the BCB.

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

REGULATION AND COMPLIANCE

Thermal bridging

REQUIREMENTS

The Part L 2010 proposal to introduce or to apply confidence margins where an accredited scheme is not used is not being implemented within this update. The guidance on thermal bridges has been updated and there are now four main options for builders to consider:

1. Adopt Approved Construction Details and use the calculated linear thermal transmittance values directly in the DER and DFEE rate calculations.
2. Use construction joint details calculated by a person with suitable expertise and experience who has followed the guidance set out in BR 497. Again, the calculated linear thermal transmittance values can be used directly in the DER and DFEE rate calculations.
3. Use the linear thermal transmittance values in the 'default' column of Table K1 SAP 2012 in the DER and DFEE rate calculations.
4. Use a conservative y-value (0.15) rather than calculate linear thermal transmittance values for each construction joint.

With regard to options 1 and 2, it is acceptable for the builder to use some approved design details and some calculated bespoke details. Where approved design details and calculated bespoke details are used for some, but not all, joint details, the default values in Table K1 SAP 2012 should be used for the other joint details.

The notional dwelling specification at SAP 2012 Appendix R includes a set of specified linear transmittance values. Although the notional dwelling specification is not prescriptive, when linear transmittance values that are poorer than those in the notional dwelling are used, this will need to be compensated for by improved standards elsewhere in the dwelling design.

When default linear transmittance values from the 'default' column of Table K1 SAP 2012 are used in the actual dwelling for the majority of construction joints, or when the conservative y-value (0.15) option is adopted, the design would need to improve significantly upon the notional dwelling values elsewhere in the design to meet the TER and TFEE rate.

Where the design opts for a default y-value (0.15) in the actual dwelling, a y-value of 0.05 will be used in the notional dwelling. This represents a thermal bridging value which is better than Accredited Construction Details (0.08), but not as good as Enhanced Construction Details (0.04). However, for the actual dwelling, the heat loss through thermal bridges would be 300% that of the notional, which is a big gap to plug.

YOU NEED TO...

- Review your current details and consider the use of Accredited Construction Details (ACDs) or specifically calculated details.
- Ensure that your energy assessor calculates the dwellings, overall thermal bridging value and verifies that this is suitable for the overall compliance strategy.
- Inform the BCB which option for thermal bridging details you are using for the development, to ensure that it considers them to be compliant with ADL1A 2013.
- Communicate the details at site level.
- Closely supervise the construction process and monitor workmanship to ensure that junction detailing is in accordance with the design.
- If changes are made, ensure that these are communicated to your energy assessor so that the changes can be checked and reflected in the as-built details submitted to the BCB.

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

Heat losses and gains from circulation pipes

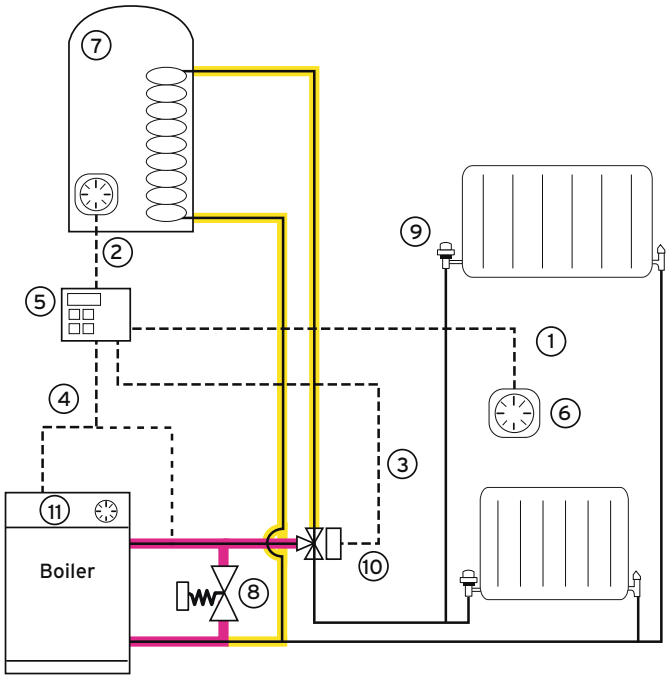
REQUIREMENTS

New guidance has been added to the Approved Documents emphasising that reasonable provision should be made to limit heat losses and heat gains from pipes as set out in the Domestic Building Services Compliance Guide. This includes insulating primary circulation pipes for domestic heating and hot water services throughout their length.

Whilst guidance on insulating hot water pipes hasn't changed from the 2010 version of the Domestic Building Services Compliance Guide, Part L 2013 gives it greater prominence by specifically noting it in the Approved Document, emphasising the effect that not insulating the pipework can have in passing unwanted heat into the dwelling.

In brief:

- Primary circulation pipes for heating circuits should be insulated wherever they pass outside of the heated living space of the dwelling or cannot be isolated during the summer months.
- Primary circulation pipes for domestic hot water circuits should be insulated throughout their length, subject to practical constraints imposed by structural elements etc.
- All pipes connected to hot water storage vessels, including the vent pipe, should be insulated for at least 1m from their point of connection to the cylinder.
- If secondary circulation is used, all pipes kept hot by that circulation should be insulated.

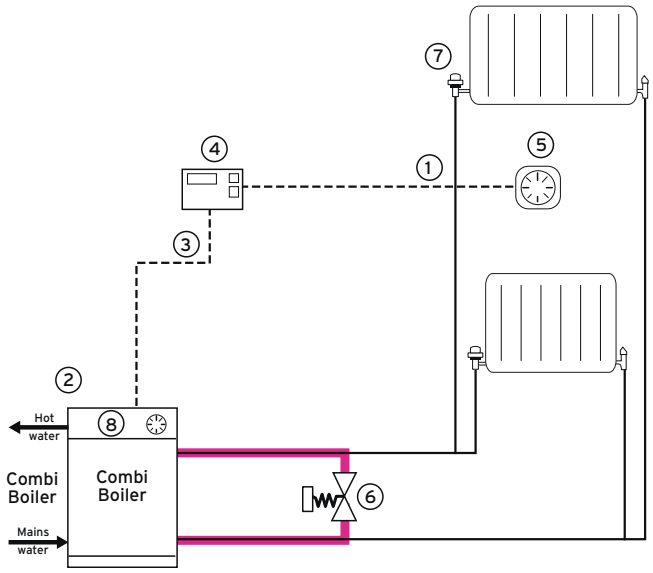


- Heating and hot water circulation (primary)
- Hot water circulation only (primary and secondary)

1. Time and temperature control for space heating
2. Time and temperature control for stored hot water
3. Switching of zone valve or valves
4. Boiler and pump interlock
5. Full programmer or two or more separate timers
6. Room (or programmable room) thermostat
7. Cylinder thermostat
8. Automatic bypass valve to the system
9. TRVs on all radiators, except rooms with a room (or programmable room) thermostat
10. Zone valve (or valves)
11. Boiler thermostat

Diagram showing pipe runs requiring insulation for typical fully pumped system

REQUIREMENTS (CONTINUED)



■ Heating and hot water circulation (primary)

1. Time and temperature control for space heating
2. Flow to hot water outlets
3. Time control for space heating and boiler interlock
4. Timer to heating area
5. Room (or programmable room) thermostat
6. Automatic bypass valve to the system
7. TRVs on all radiators except rooms with a room (or
8. programmable room) thermostat
9. Boiler thermostat

Diagram showing pipe runs requiring insulation for a typical combi system

YOU NEED TO...

- Review your current specification to ensure that allowance is made for insulating primary circulation pipes for domestic heating and hot water services in accordance with the Domestic Building Services Compliance Guide 2013.
- Communicate the details and specification at site level.
- Closely supervise the construction process and monitor workmanship to ensure that insulation of the primary circulation pipes is in accordance with the design.

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

Other key changes

REQUIREMENTS

Heating systems

The Domestic Building Services Compliance Guide 2013 now requires two space heating zones, each with an independently controlled heating circuit, only in dwellings that are greater than 150m^2 in floor area where they are fitted with a wet gas fired system.

This means that the minimum requirement for heating dwellings that are less than 150m^2 in floor area is for a single zone. However, caution should be exercised because the notional dwelling in the recipe assumes two zones for all dwellings, apart from single storey open plan dwellings where the living space is 70% of the total floor area. Therefore, if a single heating zone is proposed, some form of compensatory measure would be needed in order to meet the TER and TFEE rate.

One addition to the control for networked multi-zone systems is the recognition of wireless TRVs that incorporate a timer control linked back to a master control.

Lighting

There are no changes to the minimum number of low energy light fittings required (three out of every four fittings). However, the Domestic Building Services Compliance Guide 2013 has added one additional criterion that states : "A single switch should normally operate no more than six light fittings with a maximum total load of 100 circuit watts." Note also that the notional dwelling assumes 100% low energy light fittings.

Conservatories and porches

The guidance in respect of how conservatories built at the same time as the dwelling should be treated has changed. Under Part L 2010, where a conservatory or porch was built at the same time as a dwelling, Part L1A 2010 applied. If the conservatory or porch was added as an extension to a dwelling after completion, the guidance in ADL1B applied.

Part L 2013 now states that, if a conservatory and/or porch is installed at the same time as the construction of the new dwelling, adequate thermal separation is provided between the dwelling and the conservatory or porch, and the dwelling's heating system is not extended into the conservatory or porch, the guidance in Approved Document L1B can be followed and the conservatory or porch would not need to be accounted for in the calculation of the TER and TFEE rate.

Where a conservatory or porch is installed at the same time as the construction of a new dwelling, and no, or inadequate, thermal separation is included between the dwelling and the conservatory or porch, or the dwelling's heating system is extended into the conservatory or porch, the guidance in ADL1A 2013 should be followed, including calculation of the TER/DER and TFEE/DFEE rate, which should take account of the conservatory and/or porch as part of the overall dwelling calculation.

YOU NEED TO...

- Review your current specification to ensure that heating systems and lighting strategy follow the guidance in the Domestic Building Services Compliance Guide 2013.
- Communicate the details and specification to your energy assessor to ensure that any changes are reflected in the TER/DER and TFEE/DFEE calculation.

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

REGULATION AND COMPLIANCE

Provision of information to homebuyers

REQUIREMENTS

With the increasing flexibility for designers to achieve compliance with Part L 2013, the guidance concerning the provision of information to homeowners has been strengthened.

Information required to be passed on to the homeowner now includes:

a) an explanation of the essential design principles (insulation, materials etc.) and the key features, with floor plans showing the location of the main heating and ventilation components in the dwelling

b) an explanation of how to operate, control and maintain the following systems:

I. space heating system

II. hot water heating system

III. ventilation system

IV. any other technology which has been included in the dwelling, e.g. solar panels or other low and zero carbon technology for which SAP Appendix Q has been used.

c) details of further important documentation which should include:

I. appliance manuals

II. the data used in the TER/DER and TFEE/DFEE rate calculations

III. the recommendations report generated with the energy performance certificate (EPC).

YOU NEED TO...

- Ensure that the homeowner is provided with the essential design principles as well as the operating and maintenance instructions for the building services upon completion.
- Ensure the homeowner is given the EPC with the associated recommendations report, together with the data used to calculate the DER/TER and TFEE/DFEE rate.
- Keep an electronic version of the TER/DER, TFEE/DFEE input data file, to help the occupier if they later decide to alter or improve their home.
- Consider the use of NHBC HUG as an effective way of delivering this information to the homeowner.

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

INFORMATION AND SUPPORT

BUILDING FOR TOMORROW (Bft) 2014

A few places are still available for the remaining Building for tomorrow events. For more information, visit: www.nhbc.co.uk/newsandcomment/Buildingfortomorrow2014/ or call 0844 633 1000 and ask for 'events'.

Date	Region	Venue
Thursday 27 February	South	Shendish Manor, Hemel Hempstead
Thursday 6 March	Northeast	Wetherby Racecourse, Wetherby
Tuesday 11 March	Northwest	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	Southwest	The Hilton, Swindon
Thursday 27 March	Northern Ireland	Hilton Templepatrick, Belfast
Thursday 3 April	Southeast	Sandown Park Racecourse, Esher

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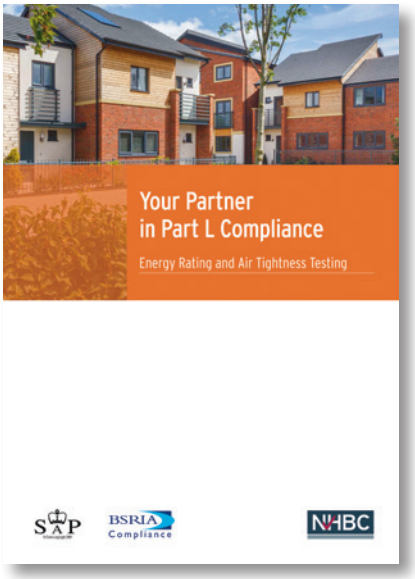

- Building Control: When you use our Part L services, we forward compliance documents directly to NHBC Building Control for you, preventing unnecessary delays.
- Standard Assessment Procedure (SAP): With over 20,000 energy ratings produced every year, our fast and efficient service delivers your SAP ratings on time, every time. When SAP is combined with NHBC Building Control, you will only need to submit your plans and drawings once and we will pass the design stage SAPs straight to Building Control to clear your Part L condition – saving you time and effort.
- Air Leakage Testing (ALT): We will provide our partner, BSRIA, with your DER figures from the SAP ready for testing. They'll send us (and you) the test results so they get to NHBC Building Control right away. And we have the APR so that we can get the EPC done right away too!
- Energy Performance Certificate (EPC): Our co-ordination of your Part L work means the EPCs are ready for you just when you need them – no delays.
- Home User Guide (HUG): This is available free to our registered builders and developers when selling homes with a Buildmark warranty. Our unique secure online portal for homeowners is an ideal place for you to give homebuyers all the information you now have to give them such as EPCs. By using our Part L services, we will automatically upload all the information for you.

Let us manage your Part L compliance needs so we can save you time, effort and money.

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

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

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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

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