

Sustainable Design and Construction

CC2: SUSTAINABLE DESIGN AND CONSTRUCTION (Strategic policy)

Proposals for development, including the construction of new building(s) and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of building(s) and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

Proposals should demonstrate application of the following energy hierarchy:

- i. Minimise and manage operational energy demand through building design, fabric performance and servicing measures;**
- ii. Use local low carbon energy resources (such as secondary heat) wherever possible to meet residual demands;**
- iii. Meet remaining residual energy demands by producing, storing and using renewable energy on-site.**

It is accepted that the amount of detail given in the demonstration of this energy hierarchy should be proportionate to the scale of the development and the scope of works proposed. In new-build proposals, compliance with the applicable targets described in A1 or A2 below will be deemed sufficient demonstration of having applied the energy hierarchy. Other major proposals (10+ homes or 1,000+ m² floorspace) should quantify the improvement made at each step of the hierarchy, from a baseline of basic regulatory compliance.

Large-scale proposals (relating to 50 or more homes, or 5,000+ m² floorspace) are also encouraged to proceed to this final step of the energy hierarchy:

- iv. Monitor and report on energy performance.**

A. Energy

A1: New build Non-residential Development

All new build non-residential developments are required to achieve net-zero development defined as¹ “a scenario in which the quantity of anthropogenic greenhouse gas emissions arising from the development’s operational energy use on an annual basis is zero or negative”. Additionally, whole-life emissions should be reduced through sustainable design measures.

All new build non-residential development proposals must include an energy statement which confirms that proposals:

- Can generate at least the same amount of renewable electricity on-site (and preferably on-plot) as they demand over the course of the year (reasonable estimates of regulated and unregulated use) using a methodology proven to accurately predict post-occupancy performance; and**
- Achieve a site average space heating demand of 15-20kWh/m²/yr and a site average total energy demand of 70kWh/m²/yr. No unit shall exceed total energy demand of 90kWh/m²/yr, irrespective of the amount of on-site renewable production. (‘Total energy**

¹ This net-zero definition, and the energy hierarchy, are aligned with industry best-practice as defined by the UK Green Building Council.

demand' means the amount of energy used as measured by the metering of the building with no deduction for renewable energy generated on site)².

An energy statement should include:

- **The predicted performance at design stage³, expressed in the metrics by which the above targets are expressed (annual space heat demand, annual energy use intensity, and amount of renewable energy generation per year)**
- **The proposed building specifications through which this performance is expected to be achieved, for comparison with the specifications that would have been used for basic regulatory compliance.**
- **For outline schemes: It is accepted that where precise details of construction and design choices are not known at this stage, the energy statement should instead identify specifications by which energy performance figures within the target range could be achieved in the type of building proposed, and commit to establishing the details by which the targets will be achieved through a subsequent reserved matters application.**

In major developments: Prior to occupation, the performance should be re-calculated, reflecting any changes to design or construction that could lead to a change in performance compared to the design-stage predictions.

Weight will be given in favour of proposals that demonstrate a commitment to on-going monitoring post-occupation that can be clearly communicated to the occupier.

Exceptional basis clause: In cases where the above energy demand and on-site renewables requirements cannot be met for technical, viability or other policy reasons (such as heritage), the energy statement should demonstrate that the applicant has pursued the targets as far as feasible and viable, and the proposed performance should be stated in the same metrics as the targets. In these cases, an applicant must demonstrate the extent to which the requirements can be met. For major developments of 1000 sqm or more, applicants must also either:

- **Enter into a legal agreement to provide off-site renewable energy infrastructure sufficient to offset the shortfall between the development's annual energy demand and its on-site annual renewable energy generation; or**
- **Provide a financial contribution to the LPA of a value sufficient enough to offset the amount by which the proposed onsite annual renewable energy generation falls short of the annual energy demand; or**
- **Demonstrate the buildings will be connected to a heat network, where the networked heat would not be gas-driven and would be**

² Applicants should refer to the LETI Climate Emergency Design Guide for specific guidance with regard to different types of non-residential buildings, such as schools or commercial offices:

https://www.leti.uk/files/ugd/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf

³ Applicants should refer to CIBSE TM54: Evaluating Operation Energy Use at Design Stage.

lower-carbon than the alternative heating solution that would have been used for regulatory compliance.

A2. New build Residential Development

All new-build housing will be required to achieve net-zero development as defined above and to achieve the following (calculated using a methodology proven to accurately predict a building's actual energy performance):

- *Site average space heating demand of 15-20kWh/m²/annum;*
- *Site average of total energy demand less than 35kWh/m²/annum;*
- *No single dwelling unit to have a total energy demand in excess of 60kWh/m²/annum, irrespective of the amount of on-site renewable energy production; and*
- *On-site renewable energy generation to match total energy use over the course of the year, with a preference for roof-mounted solar PV.*

Exceptional basis clause: *In cases where the above energy demand and on-site renewables requirements cannot be met for technical, viability or other policy reasons (such as heritage), the energy statement should demonstrate that the applicant has pursued the targets as far as feasible and viable, and the proposed performance should be stated in the same metrics as the targets. In these cases, an applicant must demonstrate the extent to which the requirements can be met. For major developments of 10 dwellings or more, applicants must also either:*

- *Enter into a legal agreement to secure off-site renewable energy infrastructure sufficient to offset the shortfall between the development's annual energy demand and its on-site annual renewable energy generation; or*
- *Provide a financial contribution to the LPA of a value sufficient enough to offset the amount by which the proposed onsite annual renewable energy generation falls short of the annual energy demand; or*
- *Demonstrate the buildings will be connected to a heat network, where the networked heat would not be gas-driven and would be lower-carbon than the alternative heating solution that would have been used for regulatory compliance.*

In cases where the points cannot be met for reasons of viability, an Energy Statement must set out in full the degree to which the requirements can be met in order to enable the development to become viable.

An Energy Statement should include pre-built estimates and as-built calculations prior to occupation. Weight will be given to proposals which demonstrate a commitment to on-going monitoring post-occupation which can be clearly communicated to the occupier.

A3. Other Non-residential or Conversions to Residential Development

Major proposals that relate to either works to existing non-residential buildings or conversion to residential should demonstrate that the energy hierarchy has

been followed as far as practicable and viable. These are not required to reach net zero but should apply the energy hierarchy in the design process and demonstrate the resulting improvement via the provision of energy and/or carbon performance figures that would occur before and after the proposed works.

B. Water Efficiency

All development must be designed to be water efficient and reduce water consumption in accordance with the ‘fittings approach’ detailed within the Building Regulations⁴. Proposals that achieve water neutrality⁵ will be particularly supported. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy- and cost-effective.

As a minimum, all water fittings and appliances within new-build housing should be compliant with the ‘optional’ standard outlined in Table 2.2 Part G of the Building Regulations.

C. Demolition and Embodied Carbon

The demolition of an existing building of 500 m² floorspace or more should be accompanied by a full justification for demolition⁶ and demonstrate how 95% of all construction waste will be diverted away from landfill⁷. For non-listed buildings of this size threshold or higher, demolition will only be acceptable where:

- **The building is in such a poor state that it is not practical or viable to refurbish or re-use;**
- **There is no demand for the building in its current use or state and that it is not practical or viable to remedy this through conversion or refurbishment,**
- **Such refurbishment or re-use would result in a similar amount or a greater amount of embodied carbon generation; or**
- **Such refurbishment or re-use would result in a building with poor thermal efficiency resulting in a greater lifetime carbon emissions than would arise from a re-build.**

All applications for new-build commercial floorspace of 5000m² or more must include an embodied carbon assessment. This assessment must demonstrate that a score of less than 800kg/m² of carbon can be achieved within the development for the substructure, superstructure and finishes.

4.1.2 The amount of new development taking place within Reading has the potential to impose a large environmental footprint in terms of consumption of resources and materials, the use of energy and the associated emission of greenhouse gases that

⁴ All water fittings and appliances installed must be compliant with Table 2.2 ‘fittings approach’ as outlined within Part G of the Building Regulations.

⁵ Water neutral development is development which does not increase the rate of water abstraction for drinking water supplies above existing levels. For every new development, water demand should first be minimised and then any remaining water demand offset, so that the total demand on the public water supply is the same after development as it was before.

⁶ Sites allocated within the Local Plan are not subject to the requirement for full justification for demolition.

⁷ Applicants should refer to the [RICS Professional Standard Whole Life Cycle Assessment](#) as a preferred methodology. Additional guidance can also be found at https://www.london.gov.uk/sites/default/files/circular_economy_statements_lpg_0.pdf

contribute to climate change. As such, the incorporation of sustainable design and construction techniques are essential in order to minimise this impact. The Reading Climate Emergency strategy (2020-25)⁸ seeks to achieve a net zero carbon Reading by 2030. New development has a significant role to play in achieving these aims and will ensure buildings are fit to exist without replacement for many years.

- 4.1.3 The general principles of this policy applies to both residential and non-residential uses. This policy incorporates new metrics which stand alone from BREEAM for on-site renewables, space heating demand and total energy demand. The BREEAM standards remain a useful guide and cover a wide range of matters including building fabrics and materials, energy and water use, amenity areas and ecology, waste recycling, the location and accessibility of developments, daylighting, sound insulation etc. However, the current standards give high scores to development in urban areas to which use previously developed land that is close to services, amenities and public transport routes. Developments in Reading will therefore naturally score relatively highly before any consideration of the impact of development itself. As such, Reading Borough Council requires that development must mitigate effects further by reducing greenhouse gas and other polluting emissions and reducing energy demand.
- 4.1.4 An existing Sustainable Design and Construction Supplementary Planning Document⁹ is in place and, and the general principles, where in compliance with the overall policy, will continue to apply.
- 4.1.5 Regarding the expectations around demonstration of the energy hierarchy:
- It is accepted that outline proposals may not be able to give great detail in the exact improvements that will be made, even if the proposal exceeds the threshold for major development. Outline proposals should therefore demonstrate that the appropriate solutions and technologies have been initially identified/explored, as appropriate to the scale of the proposal, and commit to pursuing the next stage of detail in the reserved matters application. For example, a large-scale outline proposal might demonstrate consideration of how energy efficiency outcomes can be affected by building orientation, density and development mix, and that opportunities or technologies for low-carbon heating and renewable energy have been considered and their suitability at the site has been identified. The aim should be to show that the parameters set in the outline proposal will enable (or at least not prevent) the pursuit of energy hierarchy improvements in the next stages of detailed design.
 - Proposals that neither meet the 'major' threshold nor the applicability of parts A1/A2 of this policy should simply provide narrative on consideration given to each hierarchy step in the design process, and design/construction decisions made as a result.
 - It is accepted that where the scope of proposed works does present any opportunities to significantly improve energy performance in any of the steps in the hierarchy, then there will be no need to demonstrate having followed the energy hierarchy.
 - It is accepted that householder applications (such as for small extensions or minor changes to homes) will not need great detail of detail on energy hierarchy.

⁸ Reading's Climate Emergency Strategy can be accessed on the Council's website at [updated Appendix 1 READING CLIMATE EMERGENCY STRATEGY 2020-25-Final.pdf](#)

⁹ The Sustainable Design and Construction SPD can be viewed on the Council's website at [Sustainable-Design-and-Construction-SPD-Adopted-December-19.pdf \(reading.gov.uk\)](#)

Applicants of such proposals are encouraged to consider what opportunities the proposed works present, and give information on energy-related design decisions where relevant. For example, an extension or loft conversion may present opportunities to improve insulation, airtightness, or glazing, compared to the basic standards required by Building Regulations. However, it is accepted that not all such householder applications will be financially able to pursue energy-related improvements above those set by Building Regulations.

- 4.1.6 Particular attention should be paid to historic buildings. As historic buildings continue to change, they must contribute to a net zero future and be fit for future users. Through sensitive adaptation and keeping buildings in use, historic buildings can make an important contribution to reducing carbon emissions and energy costs. Applicants should refer to advice from Historic England on adapting historic buildings for energy and carbon efficiency¹⁰. The LETI Climate Emergency Retrofit Guide¹¹ is also a useful resource for applicants.
- 4.1.7 In terms of water efficiency, there is a clear need to ensure that the highest possible standards are in place, particularly given the likely effects of climate change. The Thames Water area is classed as a 'water-stressed area' by the Environment Agency, and the Thames River Basin Management Plan stresses the importance of demand management in the area. For clarity, the tighter water efficiency standard referred to in the policy is set out in the 'Optional' standard within Part G of the Building Regulations and should be achieved through a fittings approach.
- 4.1.8 Reading Council encourages all new housing development to utilise Thames Water's 'environmental incentive' which offers financial assistance to achieve high performance levels for water fittings and appliances, the inclusion of water reuse technologies (rainwater and/or greywater recycling), and water neutrality.

Standards for New Housing

H5: SPACE AND ACCESSIBILITY STANDARDS FOR NEW HOUSING (Strategic policy)

New build housing should be built to the following standards, unless it can be clearly demonstrated that this would render a development unviable:

- a. All new build housing outside the Central Area as defined on the Proposals Map will comply with the nationally-described space standard.***
- b. All new build housing will be accessible and adaptable in line with M4(2) of the Building Regulations, unless it is built in line with M4(3) (see below).***
- c. On developments of 20 or more new build dwellings, at least 10% of dwellings will be wheelchair user dwellings in line with M4(3) of the Building Regulations. Any market homes provided to meet this requirement will be 'wheelchair adaptable' as defined in part M, whilst homes where the Council is responsible for allocating or nominating an individual may be 'wheelchair accessible'.***

- 4.4.39 The Government has sought to consolidate the wide range of standards required for new housing across the country. The approach has been to rely on minimum requirements in the Building Regulations for most matters, but to set a small number of 'optional' national standards over and above the Building Regulations minima, which local planning authorities can choose to apply in their areas. These 'optional'

¹⁰ [Historic England Advice Note 18](#)

¹¹ [LETI Climate Emergency Retrofit Guide](#)

standards cover internal space, water efficiency and accessibility. The 'optional' water efficiency standard is required under CC2.

- 4.4.40 These 'optional' standards can only apply where a policy is included in a Local Plan. This policy therefore applies those standards in Reading Borough. It should be noted that the standards are only 'optional' for the local planning authority to apply in their areas, but that once applied, compliance in line with the policy is compulsory. Conditions will be applied to relevant planning permissions to ensure compliance with the policy. For water efficiency and accessibility, the standards will be applied through the Building Regulations. Planning conditions may be required to secure compliance. Where references to the Building Regulations in the policy change, the requirement shall be taken to refer to the most up-to-date standard. Housing in the centre will also need to consider the requirements of policy CR6. These standards apply to residential uses in the C3 use class only.
- 4.4.41 As recommended in Planning Practice Guidance, it is appropriate to avoid immediate application of new standards to allow time for any associated costs to be factored into developments, including land deals, as they emerge. It is considered that the date of adoption of the plan is appropriate, as the draft policy has been public since 2024.
- 4.4.42 Housing standards serve an important role in ensuring resident health and well-being. Providing the appropriate types of housing at affordable levels can reduce overcrowding, unhealthy living conditions, injuries in the home and social isolation¹². Deprived residents are more likely to experience poor health outcomes as a result of substandard housing.

Internal space

- 4.4.43 Ensuring sufficient levels of internal space is essential to the quality of life of residents of the Borough, which is a key element of the vision for the Borough. The Council is concerned that a great deal of development has now taken place under permitted development rights that provides inadequate internal space. This cannot be controlled, but, where it is possible to do so, it is important to ensure that there is as much housing with adequate internal space as possible. However, it is considered that there is a distinction between what counts as adequate internal space within the centre of Reading and elsewhere. The expectations of those choosing to live in the centre of Reading, in terms of both internal and external space, as well as issues such as noise, tend to be different to those in other parts of the Borough. In addition, in central Reading, applying the space standard could have the effect of reducing the ability of the area to make its expected portion of the housing need, as many existing developments, including some that are well-regarded, would not have gone ahead in their current form were the space standard in force.
- 4.4.44 However, even where it does not apply, the nationally described space standard offers a useful point of reference and a good basis for design of new developments. The standard as of March 2015 is set out below, and requires that:
- a. the dwelling provides at least the gross internal floor area and built-in storage area set out in Figure 4.7 below;
 - b. a dwelling with two or more bedspaces has at least one double (or twin) bedroom;

¹² NHS Healthy Urban Development Checklist <http://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2014/04/Healthy-Urban-Planning-Checklist-March-2014.pdf>

- c. in order to provide one bedspace, a single bedroom has a floor area of at least 7.5 sq m and is at least 2.15m wide;
- d. in order to provide two bedspaces, a double (or twin bedroom) has a floor area of at least 11.5 sq m;
- e. one double (or twin bedroom) is at least 2.75m wide and every other double (or twin) bedroom is at least 2.55m wide;
- f. any area with a headroom of less than 1.5m is not counted within the Gross Internal Area unless used solely for storage (if the area under the stairs is to be used for storage, assume a general floor area of 1 sq m within the Gross Internal Area);
- g. any other area that is used solely for storage and has a headroom of 900-1500mm (such as under eaves) is counted at 50% of its floor area, and any area lower than 900mm is not counted at all;
- h. a built-in wardrobe counts towards the Gross Internal Area and bedroom floor area requirements, but should not reduce the effective width of the room below the minimum widths set out above. The built-in area in excess of 0.72 sq m in a double bedroom and 0.36 sq m in a single bedroom counts towards the built-in storage requirement;
- i. the minimum floor to ceiling height is 2.3m for at least 75% of the Gross Internal Area

Figure 4.5: Minimum gross internal floor areas and storage (sq m)

Number of bedrooms (b)	Number of bed spaces (persons)	1 storey dwellings	2 storey dwellings	3 storey dwellings	Built-in storage
1b	1p	39 (37)*			1.0
	2p	50	58		1.5
2b	3p	61	70		2.0
	4p	70	79		
3b	4p	74	84	90	2.5
	5p	86	93	99	
	6p	95	102	108	
4b	5p	90	97	103	3.0
	6p	99	106	112	
	7p	108	115	121	
	8p	117	124	130	
5b	6p	103	110	116	3.5
	7p	112	119	125	
	8p	121	128	134	
6b	7p	116	123	129	4.0
	8p	125	132	138	

4.4.45 The full standard can be viewed on the gov.uk website¹³.

¹³https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/524531/160519_Nationally_Descri_bed_Space_Standard_Final_Web_version.pdf

Accessibility

- 4.4.48 There are two levels of 'optional' standards for accessibility. M4(2) of the Building Regulations is for accessible and adaptable dwellings, and relates to relatively straightforward design measures that can allow homes to be adaptable as the needs of the occupier change. In that sense, it is broadly in the same vein as Lifetime Homes, although not identical. M4(3) relates more specifically to wheelchair user housing. The specific requirements can be seen in the Part M approved document.¹⁴ In terms of part M4(3), Part M distinguishes between 'wheelchair accessible' dwellings (which apply only where the Council is responsible for allocating or nominating an individual) and 'wheelchair adaptable' dwellings (which can apply to any homes), and the policy therefore reflects this distinction.
- 4.4.49 The requirements for wheelchair housing have been set at a level that would allow Reading to meet its expected requirement. The need for wheelchair user housing is expected to grow with an ageing population, and this has been factored into the requirements. In terms of accessible and adaptable homes, it is more difficult to identify a specific requirement. This standard is about more than addressing specific needs, rather it is a changing approach, which enables those who may not have specific needs now to remain in their homes as their circumstances change. Since it involves relatively simple design features, it is considered that 100% of new dwellings can be built to this standard without it being an overly onerous requirement.
- 4.4.50 In terms of applying the 10% requirement, where it would result in a fraction of a wheelchair user dwelling, provision should be to the nearest whole dwelling. For instance, 10% of a development of 35 homes would be 3.5, which should result in provision of four homes.

¹⁴ <https://www.gov.uk/government/publications/access-to-and-use-of-buildings-approved-document-m>