Sustainable Design and Construction

CC2: SUSTAINABLE DESIGN AND CONSTRUCTION (Strategic policy)

Proposals for new 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.

All non-residential new-build developments are required to achieve net-zero development defined as "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, and where whole-life emissions are reduced through sustainable design measures." Net zero building status must be achieved through the 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; and***
- ***iv. Monitor and report on energy performance[11].***

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 as per points i-iii above, demonstrate the resulting improvement via the provision of energy and/or carbon performance figures that would occur before and after the proposed works. Accepted metrics for these figures include Part L metrics (Building Emissions Rate, Fabric Energy Efficiency, Primary Energy Rate) calculated using SAP, SBEM or HEM; renewable energy generation per annum; or space heat demand and energy use intensity calculated using accurate energy prediction methodologies such as PHPP or CIBSE TM54.

All new-build non-residential development proposals for 100m^2 floorspace or more must include an energy statement which confirms that the proposal:

- ***v. Has followed the energy hierarchy in the design process, as expressed in steps i-iv above (and in major development, demonstrate what improvement is made on Part L 2021 TER at each step)***
- ***vi. Will achieve an overall improvement on the Building Regulations Part L 2021 Target Emission Rate (TER), given as a % reduction (and also comparing this against the TER of Part L in force at the time of application, to make clear whether any improvement is made on the national standard)***

[11] This net-zero definition and mitigation hierarchy represents industry best-practice as defined by the UK Green Building Council.

vii. ***Will not use fossil fuel on site for heating or other building systems other than safety-critical backup power***

viii. ***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[12]) using a methodology proven to accurately predict post-occupancy performance[13].***

<u>Exceptional basis clause:</u> In cases where the above points on energy and carbon performance cannot be met for technical, viability or other policy reasons (such as heritage), the applicant must demonstrate that the applicable requirements will be met to the fullest viable reasonably practical extent. In such cases in major developments of 1000 sqm or more, applicants must also either:

i. ***Enter into a legal agreement to provide renewable energy infrastructure off-site that is equivalent to at least offsetting the additional energy requirements not achieved on site; or***

ii. ***Provide a financial contribution to the LPA of a value sufficient to offset the amount by which the building's annual energy use exceeds its annual renewable energy generation[14]; or***

iii. ***Demonstrate the building(s) will be connected to a heat network.***

iv. ***See also the expectation around BREEAM certification below.***

Additional material weight in favour of the development will be given where a proposal demonstrates that it will achieve:

- ***A site average space heating demand of 15-20kWH/m2/yr and***
- ***A site average total energy demand of 70kWH/m2/yr, within which no unit exceeds a total energy demand of 90kWH/m2/yr. ('Total energy demand' means the amount of energy used as measured by the metering of the building with no deduction for renewable energy generated on site).[15]***

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[12] Please note that this requirement only covers the energy use within the building itself. It is not required to match the energy of electric vehicle charging; however, where the developer proposes to do so this will be seen as a material benefit of the development.

[13] Please note that in Part L 2021, non-residential buildings of over 1,000m2 are already legally required to conduct 'energy forecasting' using an accurate methodology, of which the only specific methodology named in Part L is CIBSE TM54.

[14] The price to be paid will be in proportion to the amount of renewable energy not provided on site, reflecting the estimated cost of renewable energy capacity installation that the local authority would need to deliver in order to mitigate the development's energy demand impact (and thus carbon). Therefore this price may change over time to reflect changing costs of PV installation or other suitable renewable energy generation technology; however, the starting price will be £1753/kWp or 1.90kWh. This reflects nationally estimated PV installation prices (average of the past 5 years; installations sized from 4-50 kW) plus a 10% margin to allow for the administrative burden that the Council will incur in managing this fund. When the grid is eventually decarbonised, the Council may in future adjust this approach so that financial contributions would be linked to residual carbon emissions rather than energy demand.

[15] 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 on commercial offices: https://www.leti.uk/_files/ugd/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf

An energy statement should include pre-built estimates and as-built calculations prior to occupation[16]. Weight will be given to proposals which demonstrate a commitment to on-going monitoring post-occupation that can be clearly communicated to the occupier.

All non-residential development or conversions to residential must be designed to be water efficient and reduce water consumption in accordance with the 'fittings approach' detailed within the Building Regulations[17]. Proposals that achieve water neutrality[18] will be particularly supported. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy- and cost-effective.

The demolition of an existing building should be accompanied by a full justification for demolition and demonstrate how 95% of all construction waste will be diverted away from landfill[19]. For non-listed buildings, 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;***
- ***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 5000m^2 or more must include an embodied carbon assessment. This assessment must demonstrate that a score of less than 800kg/m^2 of carbon can be achieved within the development for the substructure, superstructure and finishes.

<u>Exceptional basis clause:</u> In cases where the above applicable requirements on energy, water efficiency, demolition or embodied carbon cannot be met for technical, viability or other policy reasons (such as heritage), the applicant must demonstrate that the applicable requirements will be met to the fullest viable reasonably practical extent. In such cases in major developments of 1000 sqm or more, applicants must also demonstrate that the proposal is compliant with BREEAM Outstanding or Excellent (or equivalent certification method).

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

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[16] Applicants should refer to CIBSE TM54: Evaluating Operational Energy Use at Design Stage.
[17] All water fittings and appliances installed must be compliant with Table 2.2 'fittings approach' as outlined within Part G of the Building Regulations.
[18] 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.
[19] Applicants should refer to the RICS Professional Standard Whole Life Cycle Assessment as a preferred methodology.

materials, the use of energy and the associated emission of greenhouse gases that 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)[20] 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 principle of this policy in terms of new development applies to both residential and non-residential uses. For non-residential uses (including non-C3 forms of accommodation) and for conversions to residential, this policy incorporates mandatory carbon performance reporting metrics from Building Regulations Part L (TER) and on-site renewable energy generation, and additionally encourages the use of new metrics of space heating demand and total energy demand. While these are expressed in the policy as being separate from the expectations around BREEAM standards, applicants should note that improvements in Part L TER, renewable energy, and the new metric of EUI can both help earn credits in the BREEAM system towards any given BREEAM rating. BREEAM gives credits not only for improvement on national standards of regulated energy and carbon performance (the TER improvement sought by the policy), but also going beyond net zero regulated carbon (such as via the policy's requirement for renewable energy to match unregulated as well as regulated energy use) and for the use of accurate energy prediction exercises in the design process, of which EUI would be an output. 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. Additionally, all BREEAM ratings of 'excellent' or better require some degree of TER improvement OR accurate energy modelling, but the credits for going beyond zero regulated carbon are optional in BREEAM. As such, a BREEAM rating alone does not guarantee a sufficiently low-carbon building (and certainly not net zero), therefore Reading Borough Council requires that development must demonstrate climate change mitigation through specific reductions in greenhouse gas and other polluting emissions and reducing energy demand, regardless of what BREEAM rating is sought.

4.1.4 Additional expectations for performance of new-build homes in terms of emissions are set out in policy H5 on housing standards. An existing Sustainable Design and Construction Supplementary Planning Document[21] is in place and, and the general principles, where in compliance with the overall policy, will continue to apply.

4.1.5 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. The achievement of UK's legislated carbon budgets and net zero 2050 goal will need the residential and non-residential buildings sectors to reach nearly net zero emissions at source in the mid-to-late 2040s without offsetting, as shown in the UK's latest carbon

[20] 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

[21] 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)

budget report[22], and therefore historic buildings will need to play their role in this. 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 efficiency[23]. The LETI Climate Emergency Retrofit Guide[24] is also a useful resource for applicants.

[22] Committee on Climate Change (2025), The seventh carbon budget. See figure Figure 3.6 Sectoral emissions in the Balanced Pathway. https://www.theccc.org.uk/publication/the-seventh-carbon-budget/#:~:text=Sectoral%20emissions%20in%20the%20Balanced%20Pathway

[23] Historic England Advice Note 18

[24] LETI Climate Emergency Retrofit Guide

Standards for New Housing

H5: 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 built to achieve water neutrality, where possible. 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 which requires a fittings approach[95]

c. All other new-build housing of one or more dwellings will be required to achieve net-zero development as defined in Policy CC2 and to achieve the following (calculated using a methodology proven to accurately predict a building's actual energy performance:

i. Site average improvement (reduction) on Building Regulations Part L 2021 TFEE (Target Fabric Energy Efficiency): 10%;

ii. Site average; improvement (reduction) on Building Regulations Part L 2021 TER (Target Emissions Rate): 100%, of which the majority should be from energy efficiency and heating system improvements; and

iii. After achieving the required 100% TER reduction (above), incorporate sufficient additional on-site renewable energy generation to match the building's unregulated energy use[96] over the course of the year, such that the building's total annual energy demand is annually matched with renewable energy, with a preference for roof-mounted solar PV.

<u>Exceptional basis clause:</u> In cases where the above points cannot be met for technical, viability or other policy reasons (such as heritage), the highest possible standards are required. In these cases, an applicant must demonstrate the extent to which the

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[95] Table 2.2 is available here and should be employed to guarantee that all fittings and appliances have appropriate water efficiency flow rates and/or volumes: https://assets.publishing.service.gov.uk/media/5a80092540f0b623026911f3/BR_PDF_AD_G_2015_with_2016_amendments.pdf

[96] Please note that this requirement only covers the energy use within the building itself. It is not required to match the energy of electric vehicle charging; however, where the developer proposes to do so this will be seen as a material benefit of the development. The unregulated energy should preferably be calculated using an accurate energy use prediction methodology. The Building Regulations Part L calculation methodology, SAP, is used to calculated TER and TFEE and also contains an "Appendix L" which purports to estimate unregulated energy use; however, applicants should be aware that Part L Appendix L overestimates unregulated energy use due to being based on outdated appliance data. Therefore if SAP is used to estimate unregulated energy use applicants may find themselves overproviding PV compared to if the energy use were estimated using a more accurate methodology such as PHPP or CIBSE TM54.

requirements will be met, disclosing the degree of performance improvement in terms of the same metrics used above (TFEE % improvement, TER % improvement, and onsite renewable energy generation as a % of buildings' energy demand). For major developments of 10 dwellings or more, applicants must also either:

- ***iv. Enter into a legal agreement to provide renewable energy generation infrastructure off-site equivalent to at least offsetting the amount by which the building's annual energy use exceeds its annual renewable energy generation; or***
- ***v. Provide a financial contribution to the LPA of a value sufficient[97] to offset the amount by which the building's annual energy use exceeds its annual renewable energy generation; or***
- ***vi. Demonstrate the buildings will be connected to a heat network; or***
- ***vii. Demonstrate that the proposal is compliant with Passivhaus Plus or Premium or Passivhaus Classic supplemented with evidence of meeting on-site renewable generation requirements (or equivalent accreditation scheme that is demonstrated to be consistent with the requirements of the policy). Where the proposal commits to achieving Passivhaus certification or the following optional performance targets calculated using PHPP methodology, this would be a further improvement on the policy's TER and TFEE targets and thus will be afforded further material weight in favour of the development:***
  1. ***Energy use intensity of <35kWh/m$^{2\ floorspace}$/year (site-wide average, with no individual dwelling exceeding 60kWh/m$^{2\ floorspace}$/year)***
  2. ***Space heat demand of <20kWh/m$^{2\ floorspace}$ /year***
- ***viii. 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 and will be met while enabling the development to remain viable.***

d. An Energy Statement should include pre-built estimates. Prior to occupation, the applicant should then submit as-built calculations disclosing the impact (on TFEE, TER, % of energy use met with new renewable energy generation capacity, and any other performance metrics given at application stage) of any relevant changes to specification or construction compared to the calculation made at

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[97] The price to be paid will be in proportion to the amount of renewable energy not provided on site, reflecting the estimated cost of renewable energy capacity installation that the local authority would need to deliver in order to mitigate the development's energy demand impact (and thus carbon). Therefore this price may change over time to reflect changing costs of PV installation or other suitable renewable energy generation technology; however, the starting price will be £1753/kWp or 1.90kWh. This reflects nationally estimated PV installation prices (average of the past 5 years; installations sized from 4-50 kW) plus a 10% margin to allow for the administrative burden that the Council will incur in managing this fund.

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

e. 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).

f. 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' standards cover internal space, water efficiency and accessibility.

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 isolation[98]. 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

[98] NHS Healthy Urban Development Checklist http://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2014/04/Healthy-Urban-Planning-Checklist-March-2014.pdf

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;

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 website[99].

Water efficiency

4.4.46 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 achieve through a fittings approach.

4.4.46 Reading Council encourages all new housing development to utilise Thames Water's 'environmental incentive[100]' which offers financial assistance to achieve high performance levels for water fittings and appliances, the

[99] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/524531/160519_Nationally_Described_Space_Standard____Final_Web_version.pdf

[100] Details of the incentives scheme can be found at http://www.thameswater.co.uk/developers/charges

inclusion of water reuse technologies (rainwater and/or greywater recycling), and water neutrality.

Emissions

4.4.47 The Reading Climate Emergency Strategy 2020-2025 sets challenging targets for tackling the Borough's contribution to climate change, and aims to achieve a net-zero carbon Reading by 2030. One of the Strategy's strategic principles is that buildings in Reading should be built to high standards of energy efficiency incorporating on-site renewable energy where possible. Given the scale of residential development in Reading up to 2041, achieving the aims of the Climate Change Strategy will not be possible without that development having a minimal impact on carbon emissions.

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.[101] 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.

[101] https://www.gov.uk/government/publications/access-to-and-use-of-buildings-approved-document-m