

*****IMPORTANT INFORMATION*****

The elements of the Sustainable Construction Checklist Supplementary Planning Document (SPD) that relate to emerging Local Plan Partial Update (LPPU) policies will only apply to planning applications determined after the adoption of the LPPU. Adoption of the LPPU is due to be considered by a meeting of full Council in January 2023.

The following policies and associated tables set out in the SPD are associated with the adoption of the LPPU:

SCR6 – *New Build Residential Development*

- Tables 1.1, 1.2, 2.1, 2.2 and 5

SCR7 – *New Build Non-Residential Development*

- Tables 3.1, 3.2 and 5

SCR8 – *Embodied Carbon*

- Tables 6 and 7

Sustainable Construction Checklist

Supplementary Planning Document



Bath & North East
Somerset Council

Improving People's Lives

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1. Introduction & Policy Context

1. Introduction & Policy Context

Introduction

1.1. On the 14th March 2019, the Council declared a Climate Emergency and pledged the Council to providing the leadership to enable Bath & North East Somerset district to become net zero by 2030.

Purpose of the SPD

1.2. This SPD supplements the Local Plan Policies CP1, CP3, CP4, SCR5, SCR6, SCR7 and SCR8, which facilitate sustainable construction.

1.3. This SPD contains key assessment tables which should be submitted with applications for new build residential properties, major new non-residential buildings and medium development on existing buildings. This document also provides guidance on the information required and how to complete the Checklist.

Local Plan Policy Context

1.4. Policies SCR6-8 are introduced through the Local Plan Partial Update and require information to be reported in this SPD. They replace the previous requirements from Core Strategy Policy CP2 and Placemaking Plan Policy SCR1.

For further guidance please refer to the Energy Efficiency, Retrofitting and Sustainable Construction SPD. This looks at the building types in our district, including historic buildings. Other aspects of sustainability such as transport, drainage and ecology are handled separately with Planning Services and are outside the scope of this SPD.



1. Introduction & Policy Context

Policy CP1 - Retrofitting Existing Buildings

Retrofitting measures to existing buildings to improve their energy efficiency and adaptability to climate change and the appropriate incorporation of microrenewables will be encouraged.

Priority will be given to facilitating carbon reduction through retrofitting at whole street neighbourhood scales to reduce costs, improve viability and support coordinated programmes improvement.

Masterplanning and 'major development' (as defined in the Town & Country Planning (Development Management Procedure (England) Order 2010) in the District should demonstrate that opportunities for the retention and retrofitting of existing buildings within the site have been included within the scheme. All schemes should consider retrofitting opportunities as part of their design brief and measures to support this will be introduced.

Retrofitting Historic Buildings

The Council will seek to encourage and enable the sensitive retrofitting of energy efficiency measures and the appropriate use of micro-renewables in historic buildings (including listed buildings and buildings of solid wall or traditional construction) and in conservation areas, whilst safeguarding the special characteristics of these heritage assets for the future. Proposals will be considered against national planning policy.

The policy will be supported by the Council's Energy Efficiency, Retrofitting and Sustainable Construction Supplementary Planning Document.

Houses in Multiple Occupation

In the case of a house in multiple occupation the property must achieve an Energy Performance Certificate "C" rating as required by Policy H2.

Policy SCR6 - New Build Residential

New build residential development will be required to meet the standards set out below.

New build residential development will aim to achieve zero operational emissions by reducing heat and power demand then supplying all energy demand through onsite renewables. Through the submission of an appropriate energy assessment, having regard to the Sustainable Construction Checklist SPD, proposed new residential development will demonstrate the following:

- Space heating demand less than 30kWh/m²/annum;
- Total energy use less than 40kWh/m²/annum; and
- On site renewable energy generation to match the total energy use, with a preference for roof mounted solar PV
- Connection to a low- or zero-carbon district heating network where available

Major Residential Development

In the case of major developments where the use of on site renewables to match total energy consumption is demonstrated to be not technically feasible (for example with apartments) or economically viable, renewable energy generation should be maximised and the residual on site renewable energy generation (calculated as the equivalent carbon emissions) must be offset by a financial contribution paid into the Council's Carbon Offset Fund where the legal tests set out in the Community Infrastructure Regulations are met.

1. Introduction & Policy Context

Policy SCR7 - Major Non Residential New Build

New build non-residential major development will maximise carbon reduction through sustainable construction measures. Through the submission of an appropriate energy assessment having regard to the Sustainable Construction Checklist SPD all planning applications will provide evidence that the standards below are met.

Major development is to achieve a 100% regulated operational carbon emissions reduction from Building Regulations Part L 2013 (or future equivalent legislation), following the hierarchy set out below.

- Minimise energy use through the use of energy efficient fabric and services
- Residual energy use should be met through connection to a low- or zero-carbon heat network if available
- Maximise opportunities for renewable energy to mitigate all regulated operational emissions
- Residual carbon emissions that cannot be mitigated on site should be offset through a financial contribution to the Council's Carbon Offset Fund

Policy SCR8 - Embodied Carbon

Large scale new-build developments (a minimum of 50 dwellings or a minimum of 5000m² of commercial floor space) are required to submit an Embodied Carbon Assessment that demonstrates a score of less than 900kgCO₂e/m² can be achieved within the development for the substructure, superstructure and finishes.

Policy SCR5 - Water Efficiency

All dwellings will be expected to meet the *national optional Building Regulations requirement* for water efficiency of 110 litres per person per day; b) Rainwater harvesting or other methods of capturing rainwater for use by the residents (e.g. water butts) will be required for all residential development, where technically feasible.

Policy CP4 - District Heating

The use of combined heat and power (CHP), and/or combined cooling, heat and power (CCHP) and district heating will be encouraged. Within the two "district heating priority areas", indicated on Diagram 19 (Bath Central, and Bath Riverside), and shown in detail in the associated evidence base, development will be expected to incorporate infrastructure for district heating, and will be expected to connect to existing systems where and when this is available, unless demonstrated that this would render development unviable, or if an alternative zero carbon heat source is proposed.

2. Type of Development

2. Type of Development

Which Applications Need to Complete the Checklist?

2.1. The following need to complete the relevant parts of the Checklist:

- New build residential dwellings*
- New build major non-residential
- Medium development (5 dwellings or more/500m² of floor space or more) or larger on existing buildings e.g. changes of use and extension**

2.2. Definition of the development types

- Large-scale development: 50 dwellings or more, or 5000m² or more commercial floor space. This definition is used for Policy SCR8.
- Major development: 10 or more dwellings, or 1000m² or more commercial floor space

2.3. Type of application required to submit the Checklist

- Full applications for planning permission
- Outline applications where appearance is applied for
- Reserved matters where appearance is applied for
- Discharge of conditions

2.4. Compliance with the policies will need to be assessed at the application stage and post construction stage to ensure that the constructed buildings comply with the policies.

2.5. Further documentation

The checklist should accompany documents that provide further detail, such as Sustainability Statements or Energy Strategies. Please reference where further information and drawings can be found.

2.6. Checklist review

The checklist may be periodically updated to reflect changes in legislation, policy and practice.

*In the context of the LPPU, all residential development types must comply with all residential policies. This includes:

- Dwellings/homes
- Co-living
- Student accommodation
- Holiday Lets
- HMOs

**The definition for a change of use is when the use of the land/building changes in a material way and to a use which is not in the same use class.

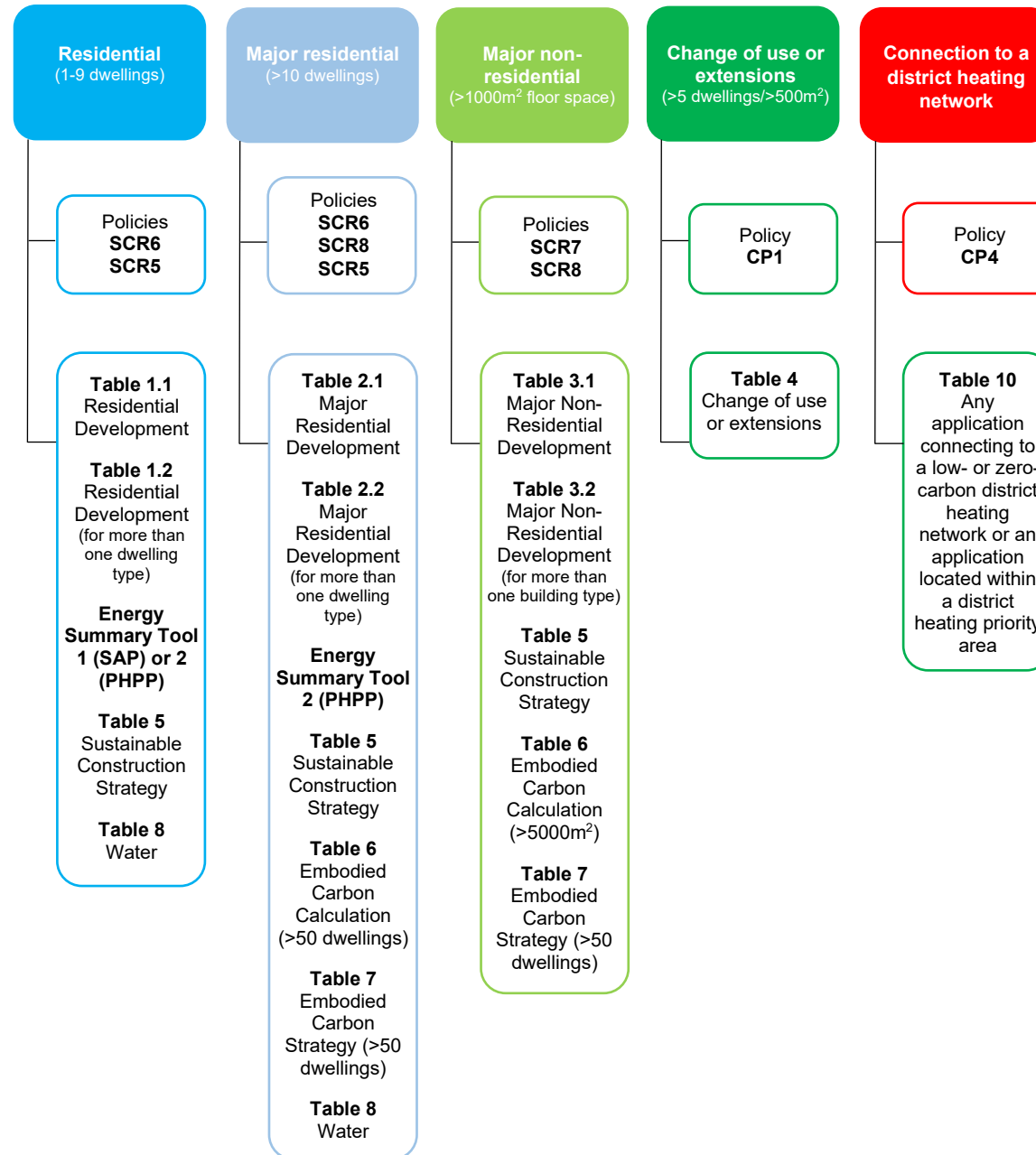
3. How to Fill in the Checklist

3. How to Fill in the Checklist

The diagram outlines what information is required for each development type.

Non-Compliance

3.1. If the proposed development cannot meet the requirement of the following policies, then **Table 11** must be completed giving full details of why the proposed development cannot comply with the policies.



PLEASE NOTE:

The tables set out in this PDF document are representative and editable documents are available separately. All applicants must complete and submit the specific Word document and Energy Summary Tool (for SCR6) listed on the Sustainable Construction Checklist SPD webpage, according to the specific development type.

4. Each Table Explained

4.a Residential

Policy SCR6 Guidance

Achieving the Space Heating Threshold

4.1. In order to achieve the space heating threshold for Policy SCR6, low levels of air permeability are essential. No particular measures or technologies are specified to achieve the threshold. However, the materials and design selected should ensure the **avoidance of thermal bridges** and the inclusion of **high-quality insulation and fenestration**. Further information on thermal bridging can be found in the [LABC's Thermal Bridging Guide](#).

4.2. The installation of a **mechanical ventilation heat recovery (MVHR) system** is strongly recommended, particularly those listed in the [Passive House certified components database](#).

4.3. It should be noted that the threshold is feasible and can be achieved with sustainable materials.

4.4. Other general principles to follow:

- Tight air barrier and thermal envelope – no draughts
- Low shape-form heat loss factor
- Low U-value glazing that compliments insulation, whilst ensuring appropriate glazing ratios and placement
- Maintain fresh air
- Link operational and embodied carbon emissions early in the design process

- Optimise orientation for shading to mitigate overheating - this should not interfere with solar PV
- Retain heat with minimal intervention

Connection to a low or zero carbon district heating network should only be carried out where it can be **demonstrated to be a lower carbon solution than an individual heating system**. Additionally, **no fossil fuels should be used on-site**. These principles also apply for Policy SCR7.

4.5. To reduce the performance gap between the design and as-built performance, it is **essential that the air tightness of the building is tested whilst the air barrier is still accessible**. Air tightness tests are required for most new homes for Building Regulations, so testing the air tightness at this stage will give an indication of the final performance. It should be noted that the air tightness required to meet the space heating threshold for Policy SCR6 will likely need to perform better than required for Building Regulations.

Achieving the Total Energy Use Threshold

4.6. The threshold includes **both unregulated and regulated** energy but does not include electric vehicle charging.

4.7. Guidance should be provided to the building occupiers to ensure that the measures and technology installed are maximised in terms of their potential efficiency. This is important in the context of ventilation systems and renewable energy generation.

Achieving the Renewable Energy Threshold

4.8. Considerations when installing on-site renewable energy to match the total energy use:

- Optimise orientation and maximise appropriate roof space i.e. large, south-facing unshaded surface area
- East/west orientated homes are able to generate more solar electricity than south-facing buildings if both sides of the roof are used, due to increased panel density
- Protect panels from wind damage, for example having a small parapet on flat roofs
- In cases where roof space is insufficient, install panels on vertical unshaded walls or ground-mounted panels
- In rare instances where installations are currently not possible, design roof space for easy installation in the future

The expected **benchmark** for on-site renewable energy generation is **120kWh per m² of roof space**.

Where roof-mounted solar PV is insufficient to match total energy demand, façade-mounted solar PV panels should be incorporated into the building design to achieve a net-zero energy balance on-site.

Policy Compliance

4.9. All developments required to comply with SCR6 must:

1. Complete the **Energy Summary Tool**
2. Complete the **Sustainable Construction Checklist SPD** (using final data from the Tool)
3. Submit **full data** from **Standard Assessment Procedure (SAP)** or **Passive House Planning Package (PHPP)**.

4.10. All dwellings within the development must meet the energy use, space heating and on-site renewable energy generation requirements individually (i.e. targets cannot be averaged out across the whole development). Non-compliance of individual dwellings will only be considered in exceptional circumstances. In these circumstances, a valid justification must be provided setting out the constraints and mitigating factors in **Table 11**. Only in exceptional circumstances, where it is **clear that all on-site opportunities have been maximised**, will non-compliance and/or offsetting (for major development only) be considered.

4.a Residential

Energy Modelling

4.11. All energy modelling must be completed by an Accredited Independent Energy Assessor, unless using SAP. The Assessor must be accredited for the specific modelling package used (e.g. PHPP). Energy modelling should follow CIBSE TM54 guidance (*Evaluating operational energy use at the design stage*). To maximise energy modelling accuracy, the Council will accept the following methodologies to assess policy compliance (in order of preference):

1. **PHPP** – suitable for all scales and dwelling types
2. **Design Stage SAP 10.1** using the **Energy Summary Tool** – suitable for most schemes of **1 – 9 dwellings** (see below)

The SAP version of the Energy Summary Tool is suitable for:

- Detached bungalows
- 2-storey mid-terrace houses
- 2-storey semi-detached/end-terrace houses
- 2-storey detached houses

It is not suitable for:

- Apartments
- Semi-detached bungalows
- Terraced bungalows
- Other dwelling types not listed
- Schemes connecting to district heating

4.12. Applicants will be required to demonstrate that any calculations carried out in SAP are a reasonable reflection of genuine in-practice building energy performance, by completing the **Energy Summary Tool**. The SAP version of the Energy Summary Tool adjusts the SAP data in order to provide a reasonable representation of genuine building energy performance. This tool is an aid to both the applicant and residents to ensure building energy performance modelling is accurate.

4.13. Any development that is not suitable for the SAP version of the Energy Summary Tool is to use PHPP.

4.14. If applicants use SAP, the SAP version of the Energy Summary Tool must be completed first. The relevant table in this SPD must then be completed using the final values generated in the Energy Summary Tool. If using PHPP, the final values in the Energy Summary Tool will not differ from the values in PHPP.

If using SAP for minor development, it is recommended that renewable energy generation values from the EPC Cost worksheet are used because local climate data is used.

Alignment with Building Regulations

4.15. The aforementioned policy requirements for Policy SCR6 are compatible with Building Regulations. Statutory guidance for the associated sections of Building Regulations are listed below:

- [Part L \(dwellings\): conservation of fuel and power](#)
- [Part F: ventilation](#)
- [Part O: overheating](#)

4.a Residential | Table 1.1 and 1.2

Residential developments

– To be completed on applications for 1 to 9 dwellings

4.15. Residential development of less than 10 dwellings must meet the requirements of Policy SCR6. The policy includes the requirements for space heating and total energy use. Total energy consumption must then be met by on site renewable energy generation, with a preference for roof-mounted solar photovoltaic panels.

4.16. Table 1.1 provides the template for reporting for energy use, space heating and renewable energy generation. Table 1.2 is required if the development consists of **more than one dwelling type**.

PLEASE NOTE:

In the context of Policy SCR6, multiple dwellings under one dwelling type are to be identical. Identical dwellings must be the same type, shape, size, specification, orientation and consist of the same renewable energy generation provision. If one or more of these building properties are not identical, this constitutes a different dwelling type. Mirrored-image houses are not considered identical.

4.a Residential | Table 1.1 and 1.2

Residential developments

– To be completed on applications for 1 to 9 dwellings

Table 1.1 - New Build Residential Properties (Policy SCR6)			
<ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 			
<p>Please tick:</p> <input type="checkbox"/> The proposal, and the figures in the table, are for a single dwelling or multiple identical dwellings			
A	Space Heating (kWh/m²/annum)	Policy requirement 30kWh/m ² /annum	SAP (use final values from Energy Summary Tool 1): or PHPP:
B	Total Energy Use (kWh/m²/annum)	Policy requirement 40kWh/m ² /annum	SAP (use final values from Energy Summary Tool 1): or PHPP:
C	On-Site Renewable Energy Generation (kWh/m²/annum)	Policy requirement to match total energy use	

4.a Residential | Table 1.1 and 1.2

Residential developments

– To be completed on applications for 1 to 9 dwellings

Table 1.2 - Proposals for more than one dwelling type					
Required for developments with more than one type of dwelling where compliance is to be proposed for the whole site, for:					
<ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 					
Identical Dwellings: Please note below a representation of each dwelling type					
Building	Dwelling type represented	Number of buildings of this type	Space Heating (kWh/m ² /annum)	Total Energy Use (kWh/m ² /annum)	On-site Renewable Energy Generation (kWh/m ² /annum)
1. [insert text and add rows as needed]			SAP (use final values from Energy Summary Tool 1): or PHPP :	SAP (use final values from Energy Summary Tool 1): or PHPP:	

4.a Residential | Table 2.1 and 2.2

Major residential developments – To be completed on applications of 10 dwellings or more

4.17. Residential developments of 10 dwellings or more are classed as major residential developments. The requirements of Policy SCR6 must be met. The policy includes the requirements for space heating and total energy use. Total energy consumption must then be met by on site renewable energy generation, with a preference for roof-mounted solar photovoltaic panels.

4.18. Energy modelling for this development type is expected to be completed using the CIBSE TM54 methodology and Passive House Planning Package to provide values for space heating and total energy use (regulated and unregulated). Please see **page 10** for supplementary information.

4.19. In exceptional circumstances, if the on-site renewable energy generation requirement cannot be met on site under valid reasoning, the residual on-site renewable energy generation must be offset through a financial contribution to the Council's Carbon Offset Fund in accordance with the Council's Planning Obligations Supplementary Planning Document.

4.20. If the development is for 50 dwellings or more, then it is strongly recommended and encouraged that a CIBSE assessment is submitted to demonstrate the TM59 overheating target has been met in the current climate, and a strategy submitted to show how overheating can be mitigated in the future climate.

4.21. Developments of over 50 dwellings or more must meet the requirements of Policy SCR8, which requires the submission of an embodied carbon assessment. Guidance is set out on **page 26** and explains what information is required.

4.22. Table 2.1 provides the template for reporting for energy use, space heating and on-site renewable energy generation. Table 2.2 is required if the development consists of **more than one dwelling type**.

PLEASE NOTE:

In the context of Policy SCR6, multiple dwellings under one dwelling type are to be identical. Identical dwellings must be the same type, shape, size, specification, orientation and consist of the same renewable energy generation provision. If one or more of these building properties are not identical, this constitutes a different dwelling type. Mirrored-image houses are not considered identical.

4.a Residential | Table 2.1 and 2.2

Major residential developments – To be completed on applications of 10 dwellings or more

Table 2.1 - Major New Build Residential Properties (Policy SCR6)			
<ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 			
Please tick: <input type="checkbox"/> The proposal is for multiple identical dwellings			
A	Space Heating (kWh/m²/annum)	Policy requirement 30kWh/m ² /annum	PHPP:
B	Total Energy Use (kWh/m²/annum)	Policy requirement 40kWh/m ² /annum	PHPP:
C	On-Site Renewable Energy Generation (kWh/m²/annum)	Policy requirement to match total energy use	
D	Residual Renewable Energy Generation (kWh/m²/annum)		
E	Equivalent Residual Carbon Dioxide to be Offset (tCO₂/annum)		
F	Financial Contribution (according to formula set out in the Planning Obligations SPD) (£)		

4.a Residential | Table 2.1 and 2.2

Major residential developments – To be completed on applications of 10 dwellings or more

Table 2.2 - Proposals for more than one dwelling type								
Required for developments with more than one type of dwelling where compliance is to be proposed for the whole site, for:								
<ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 								
Identical Dwellings: Please note below a representation of each dwelling type								
Building	Dwelling type represented	Number of buildings of this type	Space Heating (kWh/m ² /annum)	Total Energy Use (kWh/m ² /annum)	On-Site Renewable Energy Generation (kWh/m ² /annum)	Residual Renewable Energy Generation (kWh/m ² /annum)	Equivalent Residual Carbon Dioxide to be Offset (tCO ₂ /annum)	Financial Contribution (according to formula set out in the Planning Obligations SPD) (£)
1. [insert text and add rows as needed]			PHPP:	PHPP:				

4.b Non-Residential | Table 3.1 and 3.2

Major non-residential development – To be completed for applications with a commercial floorspace 1000m² or more

4.23. Major non-residential development must meet the requirements of Policy SCR7. This requires a 100% CO₂ reduction through a fabric first approach. In exceptional circumstances where this does not result in a 100% reduction, then the residual CO₂ emissions must be offset.

4.24. The required figures can be found in the SBEM assessment required by Building Regulations Part L.

4.25. Carbon reductions from energy efficiency measures are calculated, starting from a baseline of the Target Emissions Rate (TER) compared with the Building Emission Rate (BER).

4.26. The target emission rate (TER) sets a minimum allowable standard for the energy performance of a building to comply with Part L of Building Regulations. The TER is defined by a notional building of the same type, size, shape and the same heat generation source as the proposed building. TER is expressed in annual kg of CO₂ per m².

4.27. The Building Emission Rate (BER)¹ is a calculation of the carbon emissions on the proposed building. This BER is the baseline for the second round of assessment. Measures can include mechanical ventilation and heat recovery (MVHR), Waste Water Heat Recovery (WWHR) and heat pumps. The contribution of renewable energy technologies is then calculated by adding the renewable energy measures to the model. The remaining carbon emissions, if any, to reach a 100% reduction from the TER is then calculated.

1 - The BER (DER for residential development) is a calculation of the CO₂ emissions for the building as actually specified.

Note that Step B is the BER emissions after energy efficiency measures, including the proposed heat source of the building, but excluding solar PV, solar thermal and wind turbine technologies.

4.b Non-Residential | Table 3.1 and 3.2

Major non-residential development – To be completed for applications with a commercial floorspace 1000m² or more

Table 3.1 - Major New Build Non-Residential Development (Policy SCR7)		
Required for: <ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 		
Please tick: <input type="checkbox"/> The proposal, and the figures in the table, are for a single building or multiple identical buildings		
A	TER baseline emissions	kgCO ₂ /m ² /annum
B	BER emissions after energy efficiency measures	kgCO ₂ /m ² /annum
C	% CO₂ reduction from energy efficiency measures only (A-B)/A*100	%
D	BER emissions after renewables are added to the energy efficiency measures	kgCO ₂ /m ² /annum
E	% CO₂ reduction from renewables only	%
F	CO₂ savings from all measures	kgCO ₂ /m ² /annum
G	% CO₂ reduction from all measures	%
H	<u>Residual carbon not met by energy efficiency or renewable energy measures to be off-set</u>	tCO ₂
I	Financial Contribution (according to formula set out in the Planning Obligations SPD) (£)	£
<input type="checkbox"/> Please tick to confirm that the two sets of design stage or post-completion Part L SAP/SBEM summary and input documents are attached. This is required for registration of the application: <ol style="list-style-type: none"> 1.The reduction in CO₂ from energy efficiency measures only (C) 2.The overall reduction once renewables are added (G) <input type="checkbox"/> For discharge applications, please tick to confirm that the MCS Certificate is attached showing that any renewable technologies cited in this table are installed and operational (for installations of up to 50kW).		
Name and registration number of independent accredited assessor conducting the assessment: <i>[Insert text here]</i>		

4.b Non-Residential | Table 3.1 and 3.2

Major non-residential development – To be completed for applications with a commercial floorspace 1000m² or more

Table 3.2 - Proposals for more than one building type							
Required for developments with more than one type of building where compliance is to be proposed for the whole site, for: <ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 							
Representative Buildings: Please note below a representation of each building type							
Building	Building type represented	Number of buildings of this type	TER	BER	% Reduction (specify % reduction individually from energy efficiency measures and renewable energy measures)	Residual carbon not met by energy efficiency or renewable energy measures to be offset	Financial Contribution (according to formula set out in the Planning Obligations SPD) (£)
1. <i>[insert text and add rows as needed]</i>			kgCO ₂ /m ² /annum	kgCO ₂ /m ² /annum	%	tCO ₂	
<input type="checkbox"/> Please tick to confirm that the two sets of design stage or post-completion Part L SAP/SBEM summary and input documents are attached. <u>This is required for registration of the application:</u> 1.The reduction in CO ₂ from energy efficiency measures only 2.The overall reduction once renewables are added <input type="checkbox"/> For discharge applications, please tick to confirm that the MCS Certificate is attached showing that any renewable technologies cited in this table are installed and operational (for installations of up to 50kW).							
Name and registration number of independent accredited assessor conducting the assessment: <i>[insert text here]</i>							

4.c Existing Buildings - Medium Development | Table 4

Change of use or extension to developments of 5 dwellings or more/500m² of floor space or more

4.28. Policy CP1 applies to proposals of medium scale or above; minimum 5 dwellings or minimum 500m² on existing buildings, e.g. extensions or changes of use.

4.29. Existing buildings may have fewer options for improving energy performance and measures should be sensitive to the existing building.

4.30. The reduction in emissions is to be achieved on the area within the planning application only, not the rest of the existing building that is outside the area of the planning application. The 'red line' determined for the planning application will usually include all of the land necessary to undertake the development. However, even if the existing building is included within the 'red line', it is only the extension (i.e. no inclusion of the existing building) that is required to meet the emissions reduction.

4.31. The table should demonstrate a 10% improvement in regulated CO₂ emissions compared to the BER or DER of a notional baseline building that meets the requirements of Part L1B for residential developments and Part L2B for non-domestic buildings. The baseline BER/DER should be modelled as follows:

- Geometry and space types as per the proposed building
- Building fabric and glazing U-values as per the requirements of Part L2B/Part L1B. Performance of thermal elements or controlled fittings that are not upgraded should be estimated as per the non-domestic EPC Conventions guidance/SAP guidance for existing dwellings
- Air tightness of the building envelope should be estimated as per the non-domestic EPC Conventions guidance/SAP guidance for existing dwellings
- New building services systems as per the minimum requirements of the Non-Domestic Building Services Compliance Guide/ Domestic Building Services Compliance Guide
- Retained building services systems as per non-domestic EPC Conventions guidance/SAP guidance for existing dwellings

Historic Buildings

4.32. Proposals for works to historic buildings will be judged on their own merits, taking into account the significance and character of the building and its setting. All Listed Building Consent applications must provide full details of energy measures including their impact on fabric, appearance or building function. Further guidance and case studies are provided in the Energy Efficiency, Retrofitting and Sustainable Construction SPD. If the proposed development cannot meet the required standard then **Table 11 (Non-Compliance)** must be completed.

4.c Existing Buildings - Medium Development | Table 4

Change of use or extension to developments of 5 dwellings or more/500m² of floor space or more

Table 4 - Change of use or extension to buildings for 5 dwellings or more/500m ² of floor space or more (Policy CP1)		
<p>Please tick:</p> <input type="checkbox"/> The proposal, and the figures in the table below, are for a single building <input type="checkbox"/> The proposal is for multiple buildings so the table below demonstrates site-wide compliance;.		
A	DER/ BER Baseline emissions from Notional Building	kgCO ₂ /m ² /annum
B	DER/ BER Emissions after All Measures (Renewables plus Energy Efficiency Measures)	kgCO ₂ /m ² /annum
	Percentage CO ₂ reduction from all measures should be at least 10% (A-B)/A*100	%
<input type="checkbox"/> Please tick to confirm that design stage/post-completion SAP/SBEM Part L summary and input documents are attached. <u>This is required for registration of the application</u> <input type="checkbox"/> For discharge applications, please tick to confirm that the MCS Certificate is attached showing that any renewable technologies cited in this table have been installed and are operational.		
Name, reference number and company of accredited independent assessor: <i>[Insert text here]</i>		

4.d Sustainable Construction Strategy | Table 5

Applies to all new build residential and major non-residential developments

4.33. Please provide details of the sustainable construction methods and strategy that will be used to comply with Policies SCR6 and SCR7.

- To be completed for Full applications or Outline/Reserved Matters applications for Appearance.
- The applicant should demonstrate that the development has maximised all available opportunities to achieve sustainable construction.

4.d Sustainable Construction Strategy | Table 5

Table 5 – Sustainable Construction Strategy				
All required sections are to be completed in 500 words or less per section, although further detail may be requested. A summary is to be provided of the approach, <u>not simply a reference to other documents</u> , although additional detail should be signposted via references to <u>named documents and drawings</u> . Outline applications should state if reserved matters applications will contain further detail.				
Passive Design e.g. addressing overheating, building form, orientation and shading, including orientation of roofs to maximise solar energy potential. Please note - this is an important consideration for Layout, so applications covering Layout should provide a full explanation of the approach.				
<i>[Insert text here]</i>				
Renewable and Low Carbon Energy e.g. solar PV, battery storage, heat pumps, solar thermal and heat networks. Please cite any drawings of renewable/low carbon technology.				
<i>[Insert text here]</i>				
Total Renewable Energy on the Whole Proposal				
Technology type (e.g. PV)	Description: Number and location of installations	Total site-wide capacity (kWp)	Estimated total annual generation (kWh)	Total CO ₂ saving from this technology (kgCO ₂)
<i>[insert text and add rows as needed]</i>				
Energy Efficiency e.g. appliances, low energy fixtures, state U-values of building elements.				
<i>[Insert text here]</i>				
Heating, Cooling and Hot Water e.g. heat pumps, responsive heating controls, underfloor heating, MVHR, waste water heat recovery.				
<i>[Insert text here]</i>				
Ventilation and Indoor Air Quality e.g. airtightness performance, natural or mechanical ventilation, windows. Note how the building will be ventilated in winter other than by opening windows if a high airtightness target is proposed.				
<i>[Insert text here]</i>				
Thermal Bridging Reduction: Please list in further detail the ways in which thermal bridging will be minimised.				
<i>[Insert text here]</i>				
Energy Performance Gap: Please note how the Performance Gap will be addressed both during and after construction Construction management practices Aftercare and post-occupation measures to ensure correct commissioning (including seasonal commissioning) and thorough handover Post-occupation performance monitoring to record whether targets are met in-use.				
<i>[Insert text here]</i>				
Smart Infrastructure e.g. smart meters and appliances, energy storage, electric vehicle charging, building management systems.				
<i>[Insert text here]</i>				
Waste e.g. re-use of materials, recycling, on-site waste etc..				
<i>[Insert text here]</i>				
Water e.g. SuDS, surface water run-off, water storage and rainwater harvesting				
<i>[Insert text here]</i>				

4.e Certified Passivhaus

Certified Passivhaus

4.34. Proposals certified to the **Passivhaus Premium** standard for new build will be considered to be compliant with SCR6 and SCR7 and do not need to fill out the required tables.

4.35. Passivhaus projects use rigorous design and construction detailing to provide a high level of occupant comfort and use very little energy for heating and cooling. Passivhaus buildings have been shown to mitigate the performance gap commonly found in new build projects, whereby post-occupancy energy use is significantly higher than is predicted at the design stage.

Evidence to be Provided

4.36. In order to qualify for Passivhaus exemption, full applications or Outline/Reserved Matters applications for Appearance are to be accompanied by

- a. Sign-off documentation from a Passivhaus Certifier (as opposed to a Passivhaus designer) confirming that the design is Passivhaus compliant.
- b. A written statement signed by the developer and the Passivhaus certified designer working on the scheme confirming that Passivhaus professionals will be employed throughout the development process and that the scheme will be able to achieve full certification.
- c. A summary output document from the Passivhaus Planning Platform (PHPP) software indicating that the design is Passivhaus compliant at this stage of development.

4.37. If a multiple-building proposal contains some units that are to be certified to Passivhaus and some that are not, those that are not to be certified will need to meet the usual requirements of Policies SCR6 and SCR7.

4.f Embodied Carbon | Tables 6 and 7

Large scale development of 50 dwellings or more/5000m² or more commercial floor space

What is Embodied Carbon?

4.38. The embodied carbon of a particular development is the total greenhouse gas emissions generation from the creation of a built asset. In the case of the Local Plan Partial Update, this includes the ‘Upfront Carbon’ which is the extraction, manufacturing, processing, transportation and assembly of the building (BS 15978 stages A1-A5). Overall product life cycle stages are shown in Fig. 1.

4.39. Reporting on stages B and C, which address in-use and end-of-life operations, respectively, is not required but is however encouraged.

Policy SCR8 - Embodied Carbon

4.40. Policy SCR8 sets out a requirement for all large residential and non-residential buildings to limit embodied carbon to 900kgCO₂e/m² GIA (as defined under NRM 2 by RICS). This requirement applies to the following building elements:

WHOLE LIFE CARBON ASSESSMENT INFORMATION														
PROJECT LIFE CYCLE INFORMATION												SUPPLEMENTARY INFORMATION BEYOND THE PROJECT LIFE CYCLE		
[A1 – A3]			[A4 – A5]		[B1 – B7]					[C1 – C4]				[D]
PRODUCT stage			CONSTRUCTION PROCESS stage		USE stage					END OF LIFE stage				Benefits and loads beyond the system boundary
[A1]	[A2]	[A3]	[A4]	[A5]	[B1]	[B2]	[B3]	[B4]	[B5]	[C1]	[C2]	[C3]	[C4]	
Raw material extraction & supply	Transport to manufacturing plant	Manufacturing & fabrication	Transport to project site	Construction & installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction Demolition	Transport to disposal facility	Waste processing for reuse, recovery or recycling	Disposal	Reuse Recovery Recycling potential
					[B6] Operational energy use									
					[B7] Operational water use									

Figure 1. – Representation of whole-life carbon stages (RICS, 2017).

1. Substructure
2. Superstructure
3. Finishes

4.41. Sequestration is not to be included in the calculation because modules A1 – A5 does not consider the whole-life-carbon of the development. For example, any trees that would sequester CO₂ would not have any impact over the timeline of modules A1 – A5.

4.42 As set out in the Code of Measuring Practice (RICS), the Gross Internal Area (GIA) is the area of a building measured to the internal face of the perimeter walls at each floor level. Further detail on what is included and excluded is found on Appendix 2.

4.43. A large-scale new build development is one that contains a minimum of 50 dwellings or has a minimum of 5000m² commercial floor space.

4.44. This policy is applicable for BS 15978 modules A1 – A5.

4.45. An embodied carbon assessment, which must be third-party verified, is to be submitted at the following stages:

- Planning application stage (RIBA Stage 3)
- Post-construction/handover stage (see Appendix 1)

4.f Embodied Carbon | Tables 6 and 7

4.46. The embodied carbon assessment and associated information is to be set out in Tables 6 and 7, which are included in the associated specific development type forms on the SPD [webpage](#).

4.47. If the development is not compliant with this policy, a valid justification must be provided with high detail to explain the exceptional circumstances as to why the target cannot be met in **Table 11**.

Policy Rationale

4.48. As operational emissions of buildings are reduced throughout time, the proportion of embodied carbon from buildings will be increasingly large, becoming a continuously more abundant source of emissions associated within the built environment. It is paramount that embodied carbon emissions must keep up with reductions to operational emissions, which are being driven by decarbonisation of the grid and enhanced energy efficiency.

4.49. To achieve meaningful embodied carbon reductions, it is essential that embodied carbon is strongly accounted for at the initial design and construction stages.

Upfront Carbon, A1-5 (exc. sequestration)

Band	Office	Residential	Education	Retail
A++	<100	<100	<100	<100
A+	<225	<200	<200	<200
LETI 2030 Design Target A	<350	<300	<300	<300
B	<475	<400	<400	<425
LETI 2020 Design Target C	<600	<500	<500	<550
D	<775	<675	<625	<700
E	<950	<850	<750	<850
F	<1100	<1000	<875	<1000
G	<1300	<1200	<1100	<1200

Figure 2. – Embodied Carbon Target Alignments values from LETI and RIBA.

4.50. The values in Fig. 2 above show benchmarks for different building typologies; the LETI 2020 Design Target for all typologies is well below the 900 kgCO₂e/m² GIA target set out in this policy. Additionally, Policy SCR8 only applies to the substructure, superstructure and finishes, whereas the benchmarks also apply for fittings, furnishings and equipment, building services and associated refrigerant leakage. Exemplary developments should therefore aim to achieve at least the LETI 2020 Design Target.

4.51. The following list sets out the key principles that should be considered to achieve embodied carbon reductions in stages A1 – A5; further detail can be found in Table 2.1 in the Greater London Authority Whole-Life Carbon guidance.

1. Reuse and retrofit of existing built structures
2. Use repurposed or recycled materials
3. Low-carbon material selection
4. Fabric first approach to reduce operational energy use
5. Low-carbon operational water use
6. Design for future disassembly
7. Efficient building shape and form
8. Use of carbon sequestering materials
9. Design for durability and flexibility
10. Approach embodied and operational carbon reductions simultaneously
11. Identify the building life expectancy

12. Source local materials
13. Minimise waste
14. Efficient and lightweight construction
15. Circular economy

Guidance on Embodied Carbon Assessments

4.52. A strong starting point, particularly for those are relatively inexperienced with embodied carbon assessments, would be to use the PAS 2080 framework (2016 Carbon management in infrastructure) and RICS Whole Life Carbon Guidance. An external consultant is also useful to include during the initial stages of an embodied carbon assessment.

4.53. It is recommended that an initial embodied carbon assessment is carried out as early as possible, during the initial design stage. This allows changes to be made prior to conceptual design initiation. UK benchmarks and targets for the building typology should be investigated early and set as an aspirational starting point. The reuse of any existing buildings/building elements and/or interrogation of the total GIA required should also be determined early, which will minimise the amount of new material needed for new spaces.

4.f Embodied Carbon | Tables 6 and 7

4.54. Communication to design and construction teams must be well developed, to ensure that embodied carbon requirements are integrated at all stages of the building's construction. An action plan to show how this will be ensured throughout all stages will be submitted by exemplary developments.

4.55. The most uncertainty and associated assumptions will be apparent at the initial design stage. However, this is useful because it gives the developer the best chance of reducing uncertainty, as future assessments will require less assumptions due to the confirmation of certain design approaches and materials to-be-used.

4.56. If accuracy is not maximised and all available mitigation measures are not employed, non-compliance with Policy SCR8 will be more likely when the post-construction assessment is carried out.

4.57. Procurement strategies and the impact of appropriate material specifications should be set early, to ensure that the requirements of this embodied carbon policy are understood and incorporated into the overall strategy, which is particularly relevant to the carbon impact from the manufacturing of selected products.

4.58. In order to successfully address embodied carbon reductions, it is vital that the following supply chain factors are considered and integrated into the

embodied carbon reduction approach from an early stage:

- The use of virgin or recycled materials
- Energy sources and the local energy grid that is linked to the manufacturing of products
- Transport methods, travel distances source to site and the distance of manufacturing plants to the site
- Amount of waste arising from product manufacturing
- On-site assembly of materials and products
- Processes used for the fabrication of products

Calculation Approaches

4.59. Acceptable approaches to calculate embodied carbon are listed below. The decision to select an alternative approach should be supported by valid justification.

- Calculation methodology should conform with BS 15978; 2011 *Sustainability of construction works – assessment of environmental performance of buildings*
- RICS Professional Statement: *Whole Life Carbon assessment for the built environment* as the methodology to calculate embodied carbon

- Data gathering shall conform to *ISO 14025: 2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.*

4.60. In the case of infrastructure projects, it is recommended that PAS 2080 – carbon management in infrastructure framework is referred to, in addition to the general guidance and recommendations provided.

4.61. Differences will inevitably occur between different assessments and should be explained where improvements and/or increases to embodied carbon are apparent.

Data and Tools

4.62. Applicants are required to adopt third-party quality assurance mechanisms, to ensure accurate assessment submissions; this is to be described in Table 7. Selecting the same person/organisation throughout all stages is encouraged and recommended to provide the utmost consistency in reporting.

4.63. Preferable data sources for embodied carbon calculations are:

- Environmental-product-declarations (EPDs) – available from product websites and/or through discussions with suppliers

- The University of Bath ICE database (Accessible via the Circular Ecology Website for free: <https://circularecology.com/embodied-carbon-footprint-database.html>)

- Proprietary data and databases

4.64. Embodied carbon factors of high accuracy and reliability are essential; EPDs and the ICE database are robust and reliable, therefore should be used. EPD quality can be measured using the 'Data Quality Matrix' on the ICEv3.0, which is attached as Appendix 3.

4.65. If specific carbon factors for materials used are not available, it is advised that carbon factors should be manually generated using *Fig. 9* from the RICS Methodology to Calculate Embodied Carbon of Materials. Certain assumptions and principles are important to consider, which are available in the Institution of Structural Engineers How to calculate embodied carbon for construction materials guidance.

4.66. Data quality standards are similarly available and should be utilised. Verifiable data is required; proof for audit is desirable. An external assessor could be used here to determine what standards are appropriate and can be complied with, whilst ensuring data verification throughout assessments and calculations.

4.f Embodied Carbon | Tables 6 and 7

4.67. Data quality standards are similarly available and should be utilised. Verifiable data is required; proof for audit is desirable. An external assessor could be used here to determine what standards are appropriate and can be complied with, whilst ensuring data verification throughout assessments and calculations.

- ISO 14064-1 Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.
- ISO 14064-2 Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
- The Greenhouse Gas (GHG) Protocol Scope 3 Standard
- PAS 2080:2016 Carbon management in infrastructure.

4.68. The following software tools listed below are preferable but others may be used. However, if an alternative software is selected, the applicant should ensure that the software covers the assessment scope from BS EN 15978 and the information reflects the product's country of origin.

- One Click LCA
- eToolLCD
- Tally
- Sturgis Carbon Calculator
- Structural Carbon Tool v1.0 (free to access)
- IES-ve IMPACT plug-in
- Bionova

4.69. The list of data sources for materials and products are considered and acceptable:

- ICE database (until RIBA Stage 2)
- Verified Type III EPDs in accordance with BS EN 15804 2012+A1:2013 or A2:2019
- Verified Type III EPDs in accordance with ISO 21930: 2017
- Verified Type III EPDs in accordance with ISO 21930: 2007
- Third-party (independently) verified, or peer-reviewed, carbon emissions to ISO 14067, EN 15804 or ISO 21930:2017 should be used as a CFP-PCR where relevant.
- Verified Type III EPDs in accordance with ISO 14025
- Peer-reviewed Life-cycle Carbon Assessment studies in accordance with ISO 14044

- Independently verified or peer-reviewed carbon emissions to PAS 2050:2011. EN 15804 should be used as the product sector specific requirements where relevant.

Embodied Carbon Assessment Submission

4.70. All assumptions and carbon factors used for the embodied carbon assessments should be clearly stated and explained in Table 7.

4.71. In Table 6, provide explicitly clear values of total tCO₂e per building element (per element of BS 15978 modules A1-A5):

Product

- A1 – Raw Material Supply
- A2 – Transport
- A3 – Manufacturing

Construction Process

- A4 – Transport
- A5 – Construction Installation Process

4.72. It should be guaranteed that the following building elements stated below are accounted for throughout the calculations of the stages set out above:

1. Substructure
 - a. Foundations
 - b. Basement Retaining Walls
 - c. Ground Floor Construction
2. Superstructure
 - a. Frame
 - b. Upper Floors
 - c. Roof
 - d. Stairs and Ramps
 - e. External Walls
 - f. Windows and External Doors
 - g. Internal Walls and Partitions
 - h. Internal Doors
3. Finishes
 - a. Wall Finishes
 - b. Floor Finishes
 - c. Ceiling Finishes

4.73. The values for overall building elements (e.g. substructure) and sub-elements (e.g. frame) are required be reported. More detailed information may be requested following the analysis of the embodied carbon assessments.

Submission Requirements

4.74. Tables 6 and 7 must be completed for both the planning application stage submission and the post-construction/handover stage submission.

4.75. It is encouraged that exemplary developments that are not subject to SCR8 also complete Tables 6 and 7 to show that embodied carbon has been considered throughout design stages.

4.f Embodied Carbon | Tables 6 and 7

Planning Application Stage (RIBA Stage 3)

4.76. The following requirements must be reported on and submitted for the planning application stage of the embodied carbon assessment:

- 1. Table 6 – Embodied Carbon Calculation**
- 2. Table 7 – Embodied Carbon Strategy**
 - a. Project and embodied carbon assessment details, including:
 - Brief description of the project and building
 - Software tool used
 - Type of EPDs used
 - Basis of design document (including list of assumptions carbon factors used)
 - b. Description and explanation of the selected third-party mechanisms to ensure accuracy of the submission
 - c. Carbon emissions associated with pre-construction demolition
 - d. Percentage of new build development that consists of existing facades, structures and buildings
 - e. Overview of the primary actions employed to achieve the required embodied carbon target
 - f. Scope to further reduce embodied carbon

4.77. It is recommended and encouraged that the applicant submits the embodied carbon assessment to the Built Environment Carbon Database at this stage and the post-construction stage. This will help inform knowledge on embodied carbon emissions reductions and maximise reporting consistency.

Post-Construction Stage Submission

4.78. The post-construction embodied carbon assessment must be secured via planning condition or legal agreement between the local authority and the applicant at the planning stage.

4.79. The following requirements must be reported on and submitted for the post-construction stage of the embodied carbon assessment:

- 1. Table 6 – Embodied Carbon Calculation (updated)**
- 2. Table 7 – Embodied Carbon Strategy (updated)**
 - a. Update any information for Sections 1 – 7.
 - b. List of updated information from the planning application stage submission, having used actual embodied carbon emissions values.

c. A comparison of the post-construction results against the baseline values reported in the planning application submission stage. An explanation must be provided where differences have occurred between the two submissions.

d. A Summary of key lessons learnt throughout the embodied carbon assessment process, which will assist future projects in streamlining embodied carbon emissions reductions. Points to consider may include:

- What worked well?
- What could be improved next time?
- Was engagement with the client effective and carried out at an early stage?
- What made the largest positive/negative impact to emissions reductions?

3. To ensure the embodied carbon assessment results have been calculated effectively and accurately, the following information must be submitted alongside the post-construction stage submission:

- Site energy (including fuel) use record

- Contractor confirmation of as-built material quantities and specifications

4.80. It should be noted that Bath & North East Somerset Council will assess all embodied carbon assessments in detail and scrutinise assessments where appropriate.

4.f Embodied Carbon | Table 6

Table 6 – Embodied Carbon Calculation					
<ul style="list-style-type: none"> • Full applications or outline/reserved matters applications for Appearance • To discharge the condition prior to occupation 					
(BCIS SFCA Classification) Building Element		Global Warming Potential (tCO₂e)			Total A1 – A5 (kgCO₂e/m²)
		Product Stage A1 – A3	Construction Stage		
		A4	A5		
Mandatory	1.1 Substructure	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	2. Superstructure	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	2.1 Frame				
	2.2 Upper Floors				
	2.3 Roof				
	2.4 Stairs and Ramps				
Mandatory	2. Superstructure	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	2.5 External Walls				
	2.6 Windows and External Doors				
	2. Superstructure	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	2.7 Internal Walls and Partitions				
	2.8 Internal Doors				
Mandatory	3. Finishes	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	3.1 Wall Finishes				
	3.2 Floor Finishes				
Optional	3.3 Ceiling Finishes				
	4. Fittings, furnishing and equipment	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	4.1 Fittings, Furnishings & Equipment				
	5. MEP	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	5.1 to 5.14 Services				
	6. Prefabricated Buildings and Building Units	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	6.1 Prefabricated Buildings and Building Units				
	7. Work to Existing Building	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
	7.1 Minor Demolition and Alteration Works				
	8. External Works	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	[enter numerical value, no decimal places]	
8.1 Site Preparation Works					
8.2 Roads, Paths, Pavings and Surfacing					
8.3 Soft Landscaping, Planting and Irrigation Systems					
8.4 Fencing, Railings and Walls					
8.5 External fixtures					
8.6 External drainage					
8.7 External Services					
8.8 Minor Building Works and Ancillary Buildings					
Total					

4.f Embodied Carbon | Table 7

<p>Table 7 – Embodied Carbon Strategy <i>[Input is intended to provide clarity and context for the numbers provided above, and to support BANES in improving these requirements]</i> Outline applications should state if reserved matters applications will contain further detail.</p>
<p>1. Embodied Carbon Overview</p> <ul style="list-style-type: none"> a. Brief project/building description b. Software tool used c. EPDs or Embodied Carbon Databases used [and links if possible] d. Basis of design document (carbon factors used required) – can be inserted as appendix
<p><i>[Insert text here]</i></p>
<p>2. Description of Third-Party Verification Approach</p> <ul style="list-style-type: none"> a. Details of third-party qualifications/skills/experience b. Declaration of their third-party independence from the project client and design team c. Description of how they have checked the calculations and overall embodied carbon assessment
<p><i>[Insert text here]</i></p>
<p>3. Approach to Reducing Pre-Construction Demolition Emissions (estimate value)</p>
<p><i>[Insert text here]</i></p>
<p>4. Percentage of Building Consisting of Existing, Reuse, or Repurposed Materials e.g. facades, structures etc.</p>
<p><i>[Insert text here]</i></p>
<p>5. Overview of Primary Emissions Reduction Measures e.g. design, low-carbon materials, re-use, reducing waste etc.</p>
<p><i>[Insert text here]</i></p>
<p>6. Remaining Scope to Further Reduce Embodied Carbon</p>
<p><i>[Insert text here]</i></p>
<p>7. Approach to Ensure Constructed Building Achieves Estimated Embodied Carbon</p>
<p><i>[Insert text here]</i></p>
<p style="text-align: center;">SECTIONS 8 – 10 ONLY REQUIRED FOR POST-CONSTRUCTION STAGE SUBMISSION</p>
<p>8. List of Updated Information from the Planning Application Stage Submission (e.g. assumptions, carbon factors, transportation modes, waste etc.)</p>
<p><i>[Insert text here]</i></p>
<p>9. Comparison of the Post-Construction Calculation Results Against Planning Application Stage Results (including an explanation where differences are apparent between submissions)</p>
<p><i>[Insert text here]</i></p>
<p>10. Summary of Lessons Learnt</p> <ul style="list-style-type: none"> a. What worked well? b. What could be improved next time? c. Was engagement with the client effective and carried out at an early stage? d. What made the largest positive/negative impact to emissions reductions?
<p><i>[Insert text here]</i></p>

4.g Water Efficiency | Table 8

Applies to all applications for one dwelling or more

4.81. Efficient use of water is important now and will become increasingly crucial as the climate changes.

4.82. Full applications or Outline/Reserved Matters applications applying for Appearance for residential proposals are to complete Table 7 Mixed use proposals should provide an assessment for the residential element of the scheme.

4.83. Major residential applications are to attach either

- The outputs of a Part G Water Calculator (widely available online) to illustrate the water efficiency strategy and demonstrate that the standard has been met OR
- If the “fittings” approach is being taken to Part G compliance, to state that the consumption of fittings will not exceed the requirements in the table for the 110 litre “Optional standard” in the [Part G document \(page19\)](#).

4.84. Pre-applications are encouraged to provide an outline of their approach to water efficiency in the narrative section of the table.

4.g Water Efficiency | Table 8

**Applies to all applications
for one dwelling or more**

Table 8 - Water (Policy SCR5)
Required for: Full applications or outline/ reserved matters applications for Appearance for residential development, or the residential element of a mixed-use scheme. Pre-applications within this scope are encouraged to provide a summary of the approach in the box below.
Outline below the approach to water efficiency e.g. low-flow rate sanitary ware and white goods. Please also describe rainwater harvesting methods to be used.
<i>[Insert text here]</i>
Please tick both boxes below to confirm compliance
<input type="checkbox"/> The 110 litres per person per day requirement will be met <input type="checkbox"/> Rainwater harvesting, collection tanks for rainwater flushing or other methods of capturing rainwater for use by the residents (e.g. water butts) has been included
Please tick one of the boxes below to confirm compliance
<input type="checkbox"/> If the Water Calculator approach to Part G compliance has been taken, please attach the output from an accredited Part G water calculator, demonstrating compliance with the 110 litre “Optional Standard” <u>This is required for registration of the application.</u> OR <input type="checkbox"/> If the “fittings” approach to Part L compliance is being used, please tick here to confirm that fittings will not exceed the consumption levels set out in the table for the 110-litre standard in the Part G document.

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

The following overheating methodologies and guidance are not a policy requirement. However, exemplary residential and non-residential developments are strongly recommended and encouraged to complete the overheating assessments and tables as follows.

4.85. Climate change is already causing overheating. Climate science indicates the temperature will be significantly warmer over the lifetime of the buildings. Building design should eliminate or minimise the need for air conditioning (active cooling) in a warmer climate to reduce CO2 emissions and the urban heat island effect.

4.86. Policies SCR6 and SCR7 do not require the submission of CIBSE overheating assessments. However, exemplary developments should complete CIBSE TM52 for non-residential development and CIBSE TM59 for residential development.

4.87. Overheating should be a primary consideration of a development's design from the earliest possible stage.

CIBSE Assessment

4.88. The compliance tools for Building Regulations are not intended to accurately evaluate overheating, so proposals are strongly recommended to use the more sophisticated [CIBSE standards](#) TM52 for non-residential development and TM59 for residential development³. The CIBSE methodologies use the criteria below:

- TM59 & TM52: "Hours of Exceedance", a measure of how often the temperature exceeds a threshold comfort temperature during a typical warm season and sets a limit of 3% of occupied hours.
- TM52: "Daily Weighted Exceedance"; the severity of overheating within any one day. The limit is no more than 6 hours a day above the thermal comfort threshold.
- TM52: "Upper Limit Temperature" which sets an absolute maximum temperature for a room beyond which the level of overheating is unacceptable.

Modelling Approach

4.89. The CIBSE assessment should be run twice with the following data files/ scenarios:

- Current Climate using CIBSE Design Summer Year (DSY1) for the 2020s, high emissions, 50th probability scenario (Swindon data should be used for this and all other modelling using CIBSE files).
- Future Climate, since the buildings constructed today will still be occupied in 2050, it is important to consider how buildings will perform under future conditions e.g. 2050 files, medium emissions, 50th probability scenario. Applicants can use the CIBSE 2050 data files, or those from [Project COLBE](#) which use climate change models at a 5km grid resolution.

Recommended Benchmarks

4.90. Meet the CIBSE TM59 or TM52 standard for the 2020s scenario (CIBSE DSY1), showing that active cooling is not needed in the current climate, meeting criteria A and B (hours of exceedance in living rooms,

4.91. Outline a strategy for the future climate showing how the building has been future-proofed to enable further passive overheating measures, e.g. the ability to install further external shading, deciduous trees that will reach maturity over the lifetime of the building.

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

4.92. Table 9.1 - Overheating Mitigation Strategy

All residential and non-residential development are strongly recommended and encouraged to submit a strategy exhibiting how overheating can be mitigated in the future climate. For each building element stated in the table, describe how the development ensures that these overheating mechanisms are accounted for and integrated into the design of the building (s).

4.93. Table 9.2 - Overheating in Residential Development

All residential development should conduct the assessment for CIBSE TM59 "[Design methodology for the assessment of overheating risk in homes](#)". Outputs are to be used to complete Table 9.2. The CIBSE assessment is to be undertaken on a baseline building with no active cooling, to demonstrate that passive measures have been maximised. We expect most residential development to achieve a "pass" for the current climate without active cooling.

4.94. Table 9.3 - Overheating in Non-Residential Development

All non-residential development is strongly recommended and encouraged to use the methodology in CIBSE TM52 "The Limits of Thermal Comfort: Avoiding Overheating in European Buildings". Modelling should be conducted for the part of the building that has the greatest risk of overheating as per the CIBSE methodology. The CIBSE assessment is to be undertaken on a baseline building with no active cooling, to demonstrate how passive measures have been maximised.

4.95. Table 9.4 - Active Cooling

It is acknowledged that for some proposals e.g. offices with deep floorplates active cooling may be needed and may be a more energy efficient way to meet the requirements of TM52 when compared to increasing non-cooled airflow. If this is shown to be the case, active cooling systems should exceed the requirements of Part L.

4.96. It is recommended that the Part L output report's 'HVAC Systems Performance' table is to be attached. This compares the cooling demand of the actual and notional buildings. Applicants should reduce the actual cooling demand below that of the notional Part L compliant cooling demand for each of the non-domestic spaces in the development where an active cooling load exists. This may mean that more than one copy of Table 9.4 is completed.

4.97. The output and inputs documents from the Part L assessment containing the HVAC Systems Performance table are to be attached to the application.

Assessment at the Application Stage

4.98 Whilst overheating modelling at the pre-planning stage may not reflect the details of the final design, modelling at an early stage ensure that consideration of overheating is embedded at an early stage. Overheating should then be considered throughout the design and build process, ensuring that the building is still compliant in order to discharge the planning condition.

4.99. **Multiple Buildings:** Proposals with multiple buildings should assess a representative sample of each building type. For apartment buildings this could be a representative sample of dwellings within the apartment block. Please consult during the pre-application process about how many assessments are needed.

4.100. It is acknowledged that some opportunities for reducing cooling demands via passive measures are constrained, for example industrial buildings including warehouses used for storage purposes; supermarkets; cinemas or theatres; laboratories or temporary structures. In such cases, all available opportunities should be exhausted to maximise the reduction of cooling demand through passive measures.

4.101. It is recommended and encouraged that the full written report using the CIBSE methodology including modelling outputs is submitted, or direct contact with modelling personnel .

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

Table 9.1 - Overheating Mitigation Strategy

Please describe how the Cooling Hierarchy has been followed. All sections are to be completed giving a summary of the response to the issue and cross-referencing where further detail can be found, in 500 words or less per section.

Minimising internal heat generation through energy efficient design: For example, passive design that minimises solar gain on south facing facades in buildings likely to overheat e.g. offices; heat distribution infrastructure within buildings should be designed to minimise pipe lengths, particularly lateral pipework in corridors of apartment blocks, and adopting pipe configurations which minimise heat loss e.g. twin pipes.

[Insert text here]

Reducing the amount of heat entering the building in summer: For example, through use of carefully designed shading measures, including balconies, louvres, internal or external blinds, shutters, careful planting of trees and vegetation to provide shade. Please also state the glazing ratios and explanation of mitigation of overheating/ daylight if the overall ratio is greater than 20% or smaller than 15%.

[Insert text here]

Use of thermal mass and high ceilings to manage the heat within the building: When carefully designed, exposed thermal mass (dense materials that can absorb and release heat slowly) can help to absorb excess heat within the building. Please cite floor to ceiling heights.

[Insert text here]

Passive ventilation: For example, through the use of openable windows, cross-ventilation, dual aspect units, designing in the 'stack effect'

[Insert text here]

Mechanical ventilation: Mechanical ventilation can be used to make use of 'free cooling' where the outside air temperature is below that in the building during summer months. If Mechanical Ventilation with Heat Recovery (MVHR) is used, please confirm that there is a by-pass on the heat recovery system for summer mode operation.

[Insert text here]

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

Table 9.2 - Overheating in Residential Development, CIBSE TM59							
Zone Name and Room Use	Criterion A: Hours of exceedance for living rooms, kitchens and bedrooms			Criterion B: Hours of exceedance for bedrooms only			Result <i>To meet the benchmark, Criteria A & B to be met for current climate</i>
	A. Occupied Hours	B. Max. no. hours exceedance (3% occupied hours)	C. Calculated No. hours exceeding Comfort Range – Not to exceed “B”	D. Annual Night time occupied hours	E. Max. no. hours exceedance (1% occupied hours)	F. Calculated no. hours exceeding Comfort Range – Not to exceed “E”	
Example: Bedroom 1	3,672	110	90	3285	32	25	Pass <input type="checkbox"/>
Example: Living room	1,989	59	40	n/a	n/a	n/a	Pass <input type="checkbox"/>
CURRENT CLIMATE - CIBSE DSY1. Results expressed in hours							
[Add rows as needed]							Pass <input type="checkbox"/>
FUTURE CLIMATE: Results expressed in hours							
Add rows as needed]							Pass <input type="checkbox"/>
<input type="checkbox"/> Please tick to verify that modelling cover sheets for “current climate” and “future climate” assessments are attached summarising performance and that a written report for TM59 has been produced in line with the CIBSE methodology. <u>This is required for registration of the application</u>							
<input type="checkbox"/> For accommodation with vulnerable occupants such as babies, elderly or disabled people, tick to verify that the Type 1 occupancy parameters in CIBSE TM52 been used							
Which building/s were selected to model and why? Please reference the relevant plans				[Insert text here]			
Which part/s of the building/s were selected to model and why? Please reference the relevant drawings				[Insert text here]			
Modelling inputs including the climate datasets, locations, software used and emissions scenario				[Insert text here]			
If the standard has not been met for the future climate scenario, please outline the future proofing strategy; how the current design enables future measures				[Insert text here]			
Name and company of independent assessor conducting the assessment: [Insert text here]							

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

Table 9.3 - Overheating in Non-Residential Development, CIBSE TM52							
Zone Name (E.g. stairwell)	Room use (e.g. circulation space)	Criterion 1: Hours of exceedance—Maximum number of hours internal temperature above outside temperature			Criterion 2: Daily weighted exceedance	Criterion 3: Upper limit temperature	Results To meet the benchmark, 2 out of 3 criteria to be met for the current climate
		A. Occupied Hours – will depend on use type	B. Maximum number of hours of exceedance (3% occupied hours)	C. Calculated no. hours exceeding comfort range - Not to exceed “B”	D. Calculated peak daily weighted exceedance – to be under 6 hours	E. Calculated no. hours exceeding absolute limit – to be zero hours	
CURRENT CLIMATE (CIBSE DSY1): Results expressed in hours							
[Add rows below]							Pass <input type="checkbox"/>
FUTURE CLIMATE: Results expressed in hours							
[Add rows below]							Pass <input type="checkbox"/>
<input type="checkbox"/> Please tick to verify that modelling cover sheets for “current climate” and “future climate” assessments are attached summarising performance and that a written report for TM52 has been produced in line with the CIBSE methodology. <u>This is required for registration of the application</u>							
<input type="checkbox"/> For accommodation with vulnerable occupants such as babies, elderly or disabled people, tick to verify that the Type 1 occupancy parameters in CIBSE TM52 been used							
Which building/s were selected to model and why? Please reference the relevant plans					[Insert text here]		
Which part/s of the building/s were selected to model and why? Please reference the relevant drawings					[Insert text here]		
Modelling inputs including the climate datasets, locations, software used and emissions scenario					[Insert text here]		
If the standard has not been met for the future climate scenario, please outline the future proofing strategy; how the current design enables future measures					[Insert text here]		
Name and company of independent assessor conducting the assessment: [Insert text here]							

4.h Overheating | Tables 9.1, 9.2, 9.3, and 9.4

Table 9.4 - Active Cooling	
Please describe below why active cooling would result in lower CO2 emissions whilst meeting the CIBSE TM52 requirement than alternatives and outline the active cooling strategy. Include the type of plant and efficiencies, and if renewable cooling sources such as ground or river water cooling are to be used.	
[Insert text here]	
Please insert below the figures from the BRUKL “HVAC Systems Performance” table	Area weighted average building cooling demand (MJ/m2)
Actual (must be lower than the notional value):	[Insert text here]
Notional:	[Insert text here]
<input type="checkbox"/> Part L output section containing the “HVAC Systems Performance” table is attached. <u>This is required for registration of the application.</u>	

4.i District Heating | Table 10

Applies to applications that include a connection to a low- or zero-carbon district heating network or an application located within a district heating priority area

4.102. District heating/ heat networks can reduce carbon emissions by using a shared renewable or low carbon heat source. The Council has conducted extensive research into heat networks to identify the opportunity areas. Placemaking Plan Policy CP4 outlines the district heating priority areas.

4.103. To determine if policy CP4 applies, please check the GIS layers on the Council's [My Maps application](#); these maps may change as our evidence base is refined.

4.104. Full guidance for the completion of Table 10 is contained in the "Heat Networks Guidance Note" that accompanies this SPD and can be found on the same webpage.

4.105. Whilst all scales of development in the Heat Network areas are expected to consider heat networks, it is understood that heat networks may be unfeasible for some developments e.g. individual dwellings or refurbishments of small non-residential units. In these cases, please provide an explanation in Question 13.

4.i District Heating | Table 10

Applies to applications that include a connection to a low- or zero-carbon district heating network or an application located within a district heating priority area

Table 10 - District Heating (Policy CP4)		
<p>Required for: Full applications or outline/ reserved matters applications for Appearance within a Heat Network Priority Area. Pre-applications are encouraged to respond to questions 1 - 5.</p> <p>See Section 13 of the Guidance and the separate “Heat Networks Guidance Note” for further detail and types and scales of development that may be considered for exemption.</p>		
1	Is the proposal in a Heat Network Priority Area?	Yes No
2	Is the proposal in a Heat Network Opportunity Area?	Yes No
<p>If “Yes” to Question 1 (Priority Area), at least one of Questions 3-5 must also be a “Yes”</p> <p>If “Yes” to Question 2 (Opportunity Area), please complete the table. If Questions 3-5 are “No” please explain further in Question 13.</p>		
3	Does the proposal include a heat network? If “Yes” please complete question 8.	Yes No
4	Does the proposal include connection to an existing heat network? If “Yes” please complete question 8.	Yes No
5	Is the proposal future-proofed to connect to future heat networks? If so, the answer to Questions 9- 12 should be “Yes”	Yes No
6	If the proposed development is in proximity to an existing district heating scheme (e.g. Bath Western Riverside), has the incumbent district heating operator been contacted to discuss the potential for connection to the existing network? Proof of contact with the operator may be required.	Yes No
7	If the proposed development is a large scale multi-building development (e.g. over 500 residential units and/or over 10,000m ² of non-residential floor space – in particular with hotels, hospitals, leisure centres or student residences), has an open-book viability assessment for district heating been carried out and full report attached?	Yes No
8	<p>If a heat network or connection to a heat network is proposed, has a document providing further details been attached? Please reference below.</p> <p>[Insert text here]</p>	Yes No
Future Proofing		
9	Single heat source: If the development includes residential apartment buildings, is heating provided to the apartments from a single central heat source as opposed to heating plant for individual units? Please explain in Question 13 if the answer is “no”.	Yes No
10	<p>Protected Pipe Routes: (a) Has a potential intake route for district heating pipe to the building(s) been identified and safeguarded? (b) Have the pipe routes been safeguarded to connect from the building plant room to the route of the district heating network? Enterprise Area applications please reference the “Potential District Heating Cluster” map in the Heat Networks Guidance Note. Please note below the document and page number containing the drawing/s upon where these measures are identified.</p> <p>[Insert text here]</p>	Yes No
11	<p>Plant room location: Is the heating plant room(s) in a location that allows access for district heating pipe (e.g. located on ground floor, adjacent to public highway) Please note below the document and page number containing the drawing/s upon where these measures are identified.</p> <p>[Insert text here]</p>	Yes No
12	<p>Plant room design: Does the plant room design allow for future connection e.g. space allowed for installation of a plate heat exchanger and additional plant as required? Please note below, including summary calculations for space allocated, and reference the document and page number showing where this is included in drawings.</p> <p>[Insert text here]</p>	Yes No
13	<p>Please add any further information</p> <p>[Insert text here]</p>	

4.j Non-Compliance | Table 11

If the proposed development does not comply with the requirements of the above policies, please complete Table 11 to provide details of non-compliance.

Table 11 - Non-Compliance
<p>We expect development to be able to comply with the policy requirements. If non-compliance with any of the requirements is proposed on the grounds of viability or technical feasibility, a full open-book viability test or technical rationale is likely to be required and the applicant will be expected to pay the cost for an independent review to determine its validity.</p>
<p>In the case of proposed non-compliance, the Checklist is still to be completed in full, making it clear which sections are non-compliant.</p>
<p>Please tick here if non-compliance with any of the policies above is proposed <input type="checkbox"/></p>
<p>Please summarise below the policies for which non-compliance is proposed and summarise the rationale for non-compliance and reference the background reports.</p>
<p><i>[Insert text here]</i></p>
<p><input type="checkbox"/> If non-compliant on cost/viability grounds: An open-book viability test is attached <input type="checkbox"/> If non-compliant on technical feasibility: An open-book technical rationale is attached</p>

Appendix 1. Sample Conditions

Appendix 1

Sample Conditions

Compliance with the policies will need to be assessed at the application stage and post-construction stage to ensure that the constructed buildings comply with the policies. The following are sample conditions relating to each policy.

SCR6 Residential Properties

Prior to occupation of the development hereby approved the following tables (as set out in the Council's Sustainable Construction Checklist Supplementary Planning Document) shall be completed in respect of the completed development and submitted for approval to the local planning authority together with the further documentation listed below. The development must comply with the requirements of SCR6.

- PHPP/SAP calculations are to be updated with as-built performance values.
- The following are to be completed using the updated as-built values for energy performance.

Minor Residential Development:

- Energy Summary Tool 1 or 2
- Tables 1.1 or 1.2 (if proposal has more than one dwelling type)

Major (or larger) Residential Development:

- Energy Summary Tool 2
- Table 2.1 or 2.2 (if proposal has more than one dwelling type)

All Residential Development:

- Table 5 (updated)
- Building Regulations Part L post-completion documents for renewables;
- Building Regulations Part L post-completion documents for energy efficiency;
- Final as-built full data report from Passive House Planning Package or SAP
- Microgeneration Certification Scheme (MCS) Certificate/s

Reason: To ensure that the approved development complies with Policy SCR6 of the Local Plan Partial Update

SCR7 Non-Residential Properties

Prior to occupation of the development hereby approved the following tables (as set out in the Council's Sustainable Construction Checklist Supplementary Planning Document) shall be completed in respect of the completed development and submitted for approval to the local planning authority together with the further documentation listed below. The development must comply with the requirements of SCR7.

- Energy performance calculations (e.g. SBEM) and the tables below are to be updated with as-built performance values.
- Table 3 or Table 3.2 (if proposal has more than one building type)
- Table 5 (updated)
- Building Regulations Part L post-completion documents for renewables;
- Building Regulations Part L post-completion documents for energy efficiency;
- Microgeneration Certification Scheme (MCS) Certificate/s

Reason: To ensure that the approved development complies with Policy SCR7 of the Local Plan Partial Update

Appendix 1

SCR8 Embodied Carbon

Prior to the occupation of the development by individual residents, hereby approved the following tables (as set out in the Council's Sustainable Construction Checklist Supplementary Planning Document) shall be completed in respect of the completed development and submitted for approval to the local planning authority together with the further documentation listed below. The development must comply with the requirements of SCR8.

Post-Completion Stage (using as-built values)

- Table 6
- Table 7
- Site energy (including fuel) use record
- Contractor confirmation of as-built material quantities and specifications
- Record of material delivery including distance travelled and transportation mode
- Waste transportation record including waste quantity, distance travelled and transportation mode
- List of product-specific EPDs for the installed products and materials

Reason: To ensure that the approved development complies with Policy SCR8 of the Local Plan Partial Update

CP1 Major or Medium Works to an Existing Building

Prior to the occupation of the development hereby approved the following tables (as set out in the Council's Sustainable Construction Checklist Supplementary Planning Document) shall be completed in respect of the completed development and submitted for approval to the local planning authority together with the further documentation listed below. The development must comply with the requirements of CP1.

- Table 4
- Building Regulations Part L post-completion documents for renewables;
- Building Regulations Part L post-completion documents for energy efficiency;
- Microgeneration Certification Scheme (MCS) Certificate/s (if renewables have been used)

Reason: To ensure that the approved development complies with Policy CP1 of the Local Plan Partial Update

SCR5 Water

The dwellings hereby approved shall be constructed to meet the national optional Building Regulations requirement for water efficiency of 110 litres per person per day.

Reason: In the interests of water efficiency in accordance with Policy SCR5 of the Placemaking Plan

CP4 - District Heating

Prior to occupation of the development hereby approved a document demonstrating how the building has been futureproofed for connection to a district heating network shall be provided for approval. The document should state the preferred intake route for the district heating pipework to the heating plant room(s). The document should show how the building design follows the relevant clauses of Objective 3.4 "To Design or Modify Suitable Space Heating and Domestic Hot Water Services Systems" of the CIBSE & ADE Heat Networks: Code of Practice for the UK. Where a clause is not relevant the document should state why. Multi-residential buildings should also demonstrate how the design follows the relevant clauses of Objective 3.9 "To Achieve an Efficient Heat Distribution System Within a Multi-residential Building and Reduce Risk of Overheating".

Reason: To ensure that the approved development complies with Policy CP4 of the Core Strategy

Appendix 1

Passivhaus Exemption

Prior to occupation of the development hereby approved the following tables (as set out in the Council's Sustainable Construction Checklist Supplementary Planning Document) shall be completed in respect of the completed development and submitted for approval to the local planning authority together with the further documentation listed below:

Passivhaus Premium Certification by accredited Passivhaus Certifier

If Passivhaus certification is not achieved, the documentation for compliance with the relevant policy, SCR6 or SCR7 shall be submitted.

Reason: To ensure that the approved development complies with Policy SCR6/7 of the Local Plan Partial Update

Appendix 2. Gross Internal Area Definition *(RICS Code of Measuring Practice)*

Appendix 2

2.0 Gross Internal Area (GIA)

Gross Internal Area is the area of a building measured to the internal face of the perimeter walls at each floor level (see note GIA 4).

Including		Excluding	
2.1	Areas occupied by internal walls and partitions	2.18	Perimeter wall thicknesses and external projections
2.2	Columns, piers, chimney breasts, stairwells, lift-wells, other internal projections, vertical ducts, and the like	2.19	External open-sided balconies, covered ways and fire escapes
2.3	Atria and entrance halls, with clear height above, measured at base level only	2.20	Canopies
2.4	Internal open-sided balconies, walkways, and the like	2.21	Voids over or under structural, raked or stepped floors
2.5	Structural, raked or stepped floors are to be treated as a level floor measured horizontally	2.22	Greenhouses, garden stores, fuel stores, and the like in residential property
2.6	Horizontal floors, with permanent access, below structural, raked or stepped floors		
2.7	Corridors of a permanent essential nature (e.g. fire corridors, smoke lobbies)		
2.8	Mezzanine floor areas with permanent access		
2.9	Lift rooms, plant rooms, fuel stores, tank rooms which are housed in a covered structure of a permanent nature, whether or not above the main roof level		
2.10	Service accommodation such as toilets, toilet lobbies, bathrooms, showers, changing rooms, cleaners' rooms, and the like		
2.11	Projection rooms		
2.12	Voids over stairwells and lift shafts on upper floors		
2.13	Loading bays		
2.14	Areas with a headroom of less than 1.5m (see APP 6)		
2.15	Pavement vaults		
2.16	Garages		
2.17	Conservatories		

Appendix 3. Data Quality Matrix on ICEv3.0

Appendix 3

Score	5 (Best)	4	3	2	1 (Worst)	Notes
Method compatibility	EN 15804	ISO 14067 or ISO 21930 or PAS 2050 or GHG Protocol for Products (<i>not including any of the other GHG Protocol standards</i>)	Other standardised method recognised nationally or internationally	Recognised method, but not standardised, e.g. ISO 14040/44 only, which is not a prescriptive method.	No recognised or standardised method	
Assurance	External panel review (e.g. ISO 14040 panel review with 3 or more people)	2 External reviewers (e.g. academic papers often have two reviewer)	1 external reviewer (e.g. EPDs)	Internal review	No review process stated	
Temporal correlation - Age of study	<= 5 years	<= 6 years	<= 7 years	< 10 years	>= 10 years	
Geographical compatibility	Data from UK	European Data or World Average	North American		All other countries and regions	Note: Ideal boundaries of ICE DB are UK. This DQI is not a statement on quality of LCA data from various regions around the world.
Transparency	Full calculation model and detailed report available (<i>very rare</i>)	Detailed report (e.g. full LCA report, documenting assumptions in detail), but no calculation model. Or transparent calculation model, but no detailed report.		Summary report covering an overview of method inc key data (most EPDs will be this rating)	Limited details on method, or key information missing	