Summary Report (v2 October 2023)

Introduction

This report has been prepared to assess the details provided to discharge conditions 14, 15, 16, 17, 20, 24 and 28 for Bicester Eco Town Exemplar Site, Banbury Road, Bicester under Application Reference 21/01227/F.

The report aims to provide a view on whether these conditions can be discharged based on the evidence submitted and subsequently what further evidence or information may be required to satisfy the conditions. The project is being assessed against planning policies from Cherwell District Council Local Plan 2011-2031.

The planning application constitutes a replan of the proposed Phase 4 of the development, comprising an amended house type mix and a change in the total number of dwellings within this phase from 54 to 57.

A full planning application is made for 57 dwellings and associated infrastructure, comprising a mix of two-storey housing across 9 house types.

Scheme Layout

According to the Sustainability Statement, 9 house types are being considered in the proposed Phase 4 of the development. However, no further description or information is given on each house type or their quantity within the proposed plot. It should be noted that the covering note does indicate 10 house types.

Condition 14

"No development shall commence until full details of the measures to achieve zero carbon energy use, as defined by Policy Bicester 1 of the Cherwell Local Plan Part 1 2011-2031, through on-site solutions, have been submitted to and approved in writing by the Local Planning Authority. Should it be demonstrated to the satisfaction of the local planning authority that it is not possible to achieve zero carbon on site, a scheme for offsite mitigation in Bicester shall be provided, prior to the first residential occupation, for that portion of the energy use that cannot be met on site."

Whilst there is no reference to Policy BIC 1 in Section 2 of the Sustainability Statement, it is mentioned in the wording of the planning condition.

The proposed design aims for sufficient, but unambitious, fabric specifications (Section 3 of the Sustainability Statement - Table 2) which are shown to meet the Part L1A 2013 limiting fabric parameters in Table 2. However, the target construction specifications are a modest improvement or present worse values than Part L1A 2013 notional dwelling specification. The 2013 Part L1A 2013 notional building value for external walls is 0.18W/m^{2}K but the proposed specification is 0.21W/m^{2}K. Rationale should be provided as to why proposed fabric specification is lower than the Part L1A 2013. There is a significant margin for further improvements in accordance with the energy hierarchy in Policy ESD 2, particularly concerning the u-values

of the external walls and windows. Please note that this has not changed since the Sustainability Statement was last issued in June 2022 and is therefore still outstanding.

Section 3 presents the obtained reduction from Target Fabric Energy Efficiency (TFEE) and Dwelling Fabric Energy Efficiency (DFEE) by house type. ~~It is unclear what is the considered building sample per house type.~~

The Applicant has used SAP 2012 v9.92 for the modelling and has provided the heat and electricity carbon factors used, noting that there is no way to use bespoke carbon factors and therefore the modelling uses the same carbon factors for heat from boilers as for heat from CHP (0.216 kgCO2/kWh), and the same factor for electricity from the grid as for electricity from the CHP (0.519 kgCO2/kWh).

It is stressed in Section 4, for the predominant house type, that improving the building fabric leads to a higher Dwelling Emission Rate (DER). This statement is contradictory to building performance fundamentals and implies that a poorer building fabric is beneficial in reducing emission rates. The calculations should be revised. We presume this relates to the use of the heat network and CHP engine e.g. greater heat demand is beneficial to the system. However, the provided information is scarce to evaluate the validity of this claim, more detail should be provided. Further clarification and elaboration on the performed calculations are required, ~~including the considered carbon factors for the CHP~~.

The Applicant now states that the additional fabric measures calculations produce results that are *"contrary to usual building physics fundamentals and that improving dwelling fabric should reduce heat losses and improve the overall energy balance of the dwellings. However, due to the way that heat is supplied via the CHP plant and the relevant carbon factors of heat and electricity produced by the plant, there is a disconnect between energy consumption and overall emissions and the calculations demonstrate an inverse relationship, with additional heat consumption delivering a benefit through lower carbon electricity generation, when compared with consumption of gas fired CHP heat".* We would recommend that the Applicant revisits their calculations and provides further justification for this, as reliance on modelling outputs may not be the best approach when it is known that improved energy efficiency would be better in reality for the future residents.

On page 14 that Applicant states that *"due to the limitations on delivering additional CO2 reductions via an improved fabric specification, a PV-led approach in accordance with Condition 5 will be pursued".* This is not compliant with Cherwell Local Plan Policy ESD2 which requires applicants to follow the energy hierarchy reducing energy use via sustainable design before making use of renewable energy.

The information presented in Table 8 of Section 5 is not clear. The presented information should be clarified including the underlying calculations. ~~Further detail should also be provided on whether the calculation in Table 9 provides a definitive answer as to whether all unregulated emissions will be offset by the overall PV generation and therefore this shows compliance with Policy BIC1.~~ The Applicant has updated the Sustainability Statement to include Section 6 to address this point. However, why does Table 9 contain the average TER of the dwellings, rather than the average DER?

The report notes that the definition of zero carbon for eco-towns is *"that over a year the net carbon dioxide emissions from all energy use within the buildings on the eco-town development as a whole are zero or below".* With regards to regulated emissions, the report states that the site-wide reductions in carbon emissions per year 'before PV' was 75.27% and after PV are 167% (this is lower than the reported reduction after PV of 170.99% reported in the Sustainability Statement from June 2022 – no commentary has been provided to confirm why this has changed). For unregulated emissions, the Applicant has used SAP estimations and reduced ("adjusted downwards") by a third "in common with previous applications within the NW Bicester development". It is not clear where this approach has been previously accepted. The Applicant should provide evidence to support this claim.

The total regulated and unregulated emissions are reported to be 93,444 $kgCO_2$/year, and total reduction in regulated emissions due to PV are reported to be 94,799 $kgCO_2$/year. Therefore, it is stated that the PV electricity generation will offset all emissions (101.45% reduction in total regulated and unregulated carbon emissions).

Based on the above, further elaboration and detail is necessary in order to discharge Condition 14.

Condition 16

"No development shall take place until a report outlining how carbon emissions from the construction process and embodied carbon have been minimised has been submitted to and approved in writing by the Local Planning Authority. The development shall thereafter be carried out in accordance with the recommendations contained in the approved report."

The evidence provides some information however it is not clearly demonstrated how sustainable construction methods are integral to the design and construction of the development following Policy ESD 3. It is not clearly outlined in ~~Section 8~~ Section 9 of the Sustainability Statement how carbon emissions have been minimised. The Sustainability Statement has been updated to include Crest Nicholson's Sustainable Procurement Policy.

An embodied carbon assessment is provided in Appendix B of the Sustainability Statement for 1 house type. ~~Further clarification is required on the choice of a single building.~~ The Applicant has stated that the embodied carbon assessment has been carried out on a single housetype but not provided the reason why this house was chosen. It is stated in the Sustainability Statement that *"there is little material variation across the housetypes and as such the assessment is considered representative of the site as a whole"*. Should the Applicant wish to represent the whole site using one dwelling it should be shown that they have used the worst-performing dwelling in terms of embodied carbon.

The major resource contributors to the embodied carbon of the buildings are identified. Carbon footprint reduction options are presented for the most impactful materials in Appendix A of the Embodied Carbon Report. However, the measures provided are generic and it is not confirmed that any of the measures will actually be delivered.

The references on how the emissions from the construction process can be minimised are also scarce and generic, without any actual and quantifiable commitments.

The Sustainability Statement should provide clear commitments to demonstrate high standards of sustainable design and construction including:

- how low embodied energy, recycled and energy-efficient materials that can be sustainably, locally and responsibly sourced have been prioritised;
- how the waste and pollution will be reduced, maximising the use of existing resources and minimising waste generated from excavation and construction.

Further elaboration is necessary to demonstrate the robustness of the provided evidence to discharge condition 16. In particular confirming which measures (for example which of the suggestions 1-4 in Appendix A, or which other measures have been chosen) to reduce embodied carbon have been implemented into the design.

Condition 20

"Prior to the commencement of development to provide the garages identified to include a green roof, full details of the construction and planting of the green roofs together with details of the maintenance programme that will ensure the delivery and long-term maintenance of the roofs shall be submitted to and approved in writing by the Local Planning Authority. The green roof shall then be constructed and maintained in accordance with the approved details."

Data from the manufacturer confirms that the green roof will be an "extensive green roof". Details of the construction and planting of the green roof are shown in documents from the manufacturer. The specifications from the manufacturer, Bauder, confirm the green roofs are proposed for the garage roofs.

~~The presented maintenance programme is generic and vague. It is not a detailed maintenance programme that will ensure the delivery and long-term maintenance of the roofs.~~

~~The green roof layout plan is not provided and therefore is not possible to assess the arrangement of the green roofs within the development.~~

The Applicant has submitted:

- A roof materials strategy plan (Pad Design, 18th March 2021) which shows in different colours the Phase 4 roofs intended for 'slate and PV', 'stone and PV' or green roofs. This confirms that every garage roof is proposed to have a green roof.
- A generic specification sheet from Bauder (manufacturer) for the extensive green roof systems (XF301 and XF300 sedum blanket roofs). This contains general maintenance activities and vegetation maintenance tasks.
- Bauder General Maintenance Watering Guide
- Bauder General Maintenance Sedum Patching Guide
- Bauder General Maintenance Lightweight Sedum System XF301 guide with general maintenance procedures.

Although not stipulated in the wording of Condition 20, after a Google Search it is confirmed that on the Bauder XF 301 sedum system datasheet that the pre-grown sedum blanket includes substrate and a growing mat and is planted with a mix of 14+ sedum varieties.

~~Further information is required to discharge condition 20~~. Sufficient information has been provided to discharge condition 20.

Condition 24

"Prior to the first occupation of each individual dwelling, the dwelling shall be provided with solar PV in accordance with a scheme to be first submitted to and approved in writing by the Local Planning Authority."

The ~~planning documents provide the PV scheme~~ Sustainability Statement contains an extract from PV Plan for the dwellings within Phase 4, PV mounting details and an energy generation estimate per plot in Phase 4.

It is shown in the PV layout plan that every dwelling is provided with solar PV.

~~More clarity is required on if the information presented in the carbon equivalent datasheet matches the carbon balance in the Sustainability Statement.~~ The Applicant previously submitted a calculation (no author, dated 9th March 2022) of the CO2 emissions offset by the PV panels for each dwelling. This cannot be matched up to the Energy Statement which states the average kgCO2 offset from PV by dwelling type rather than by dwelling. It is not clear how many PV panels and the kWp proposed to each dwelling, and how this has been allocated. For example, were south-facing roofs modelled to accommodate more PV? Can any information be provided about the proposed manufacturer, capacity (Watts) or efficiency of the PV panels?

Further clarification is required before condition 24 is discharged.

Condition 28

"All properties shall be provided with a system for rainwater harvesting in accordance with details to be submitted to an approved in writing prior to the first occupation of any dwelling. The rainwater harvesting system shall be implemented in accordance with the approved details."

The planning documents provide details on the proposed system for rainwater harvesting, including the plumbing plans for several house types and data from the manufacturer on the installation and operation of the system. The datasheet from RainDirector confirms that the proposed rainwater system includes a control

panel, smart header tank to be installed in the loft/roof and a mains electric submersible pump and that the system is designed to comply with UK Building Regulations and WRAS.

~~No information is provided concerning water-saving potential of the proposed system for rainwater harvesting.~~ The Applicant has submitted a Drainage Cover Letter, Drainage Calculations, R16086 and Water Calculations, as follows:

- The Cover Letter (Sika Limited, 20th May 2019, revision B) confirms that Sarnafil blue roofs are proposed for the roofs of Buildings B07, B08 and B09. Are these calculations still relevant given the date on the letter? Why do these calculations not contain all of the blocks shown in the plans?
- Drainage calculations (Sika Limited, 7th March 2019) confirm the effective roof areas of 44 sqm, 40 sqm and 41 sqm on the three proposed roofs. Are these calculations still relevant given the date on the letter?
- R16086 are rainwater collection roof plans from Wavin Ltd (dated 27th February 2018) confirming the effective roof area for Blocks B01 (42m^2), BO25 (44m^2), B07 (24 + hopper 38m^2), B08 (40 + hopper 37m^2), B09 (26+ hopper 26 + hopper 13 m^2), D01 (29 + hopper 25m^2), D02 (29 + hopper 24m^2), D07 (51 + hopper 24m^2), D10 (29 m^2), D13 (47 m^2), D17 (41 m^2) and D19 (25 m^2).
- The Code for Sustainable Homes Water Calculations Tool shows that for the three dwelling types modelled, a rainwater collection area of 46m2 has been entered into the tool (this does not match the Cover Letter and Drainage Calculations from Sika Limited). The CfSH Water Tool also shows that the rainwater collected would be used for WC flushing and that for dwelling types 1 and 3 there is a shortfall of 0.26 litres/person/day rainwater for WC flushing that would need to be met with potable water from the mains. For dwelling type 2 the shortfall is shown to be 2.18 litres/person/day.

The number of buildings which will have rainwater harvesting is not clear, based on the evidence provided.

Is it required that all WC flushing be met by rainwater?

Further information is required on condition 28 as the evidence provided does not match up or provide a consolidated set of evidence to demonstrate the final rainwater approach proposed.

Conclusion

The revised application for the development of Phase 4 at Bicester Eco Town Exemplar Site, Banbury Road, Bicester partially addresses the conditions for planning permission. The application should be updated following the above comments to be able to discharge the planning conditions.

Based on the evidence submitted, it cannot be confirmed that Policy BIC1 has been complied with, which requires *"high quality exemplary development and design standards including zero carbon development…..and the use of low embodied carbon in construction materials".* The evidence provided for conditions 14 and 16 do not demonstrate exemplary level commitments.

Planning condition 14 requires particular attention and the considered assumptions and calculations should be revisited and explained. This condition concerns the measures to achieve zero carbon energy use and therefore is of central importance.

Additionally, the evidence on planning condition 16 can also be highlighted by lack of confirmation that actual commitments to minimise embodied carbon have been incorporated into the dwellings as a result of modelling the embodied carbon and recommendations of the analysis.