GD03 Sustainable Design & Planning

UNIVERSITY OF LEICESTER

Document Control

Rev	Date	By	Comments
A	Jun'16	L.Davies	Technical review update
B	Oct'17	L.Davies	Updated to local planning requirements
C	Dec 17	UoL	Sign off for release
D	July 2020	UoL	Minor Updates

Design Guidance

1. In general terms, the following approach should be adopted to reduce CO_2 emissions: reduce the demand for energy in the building (demand minimisation) and reduce the carbon content of the fuel used to provide that energy. Note as regards the choice of energy source that the external electrical grid is rapidly becoming decarbonised and that this may lead to choices of equipment and plant that use grid electrical power as an energy source.
2. It is paramount that the energy demand is minimised prior to renewable technologies being used to decarbonise the energy supply. For further assessment of the passive low energy design approach refer to GD01.
3. Particularly for new developments, the following hierarchy of importance should be used to prioritise design solutions. The principles shall also apply to refurbishment projects where practicable. Demand minimisation shall be prioritised as follows: -
    a. Engineering the building to act as the primary environmental modifier to minimise energy demands. This to initially appraise options for size, shape, location and orientation. Once agreed then room locations, good envelope design with mass exposure, airtightness, passive night cooling, maximum daylight penetration, limitation of solar gains are all to be analysed in detail.
    b. Ensuring that the services systems are designed in the first instance to minimise energy consumption and employ low energy mechanical and electrical concepts with simple user understood integrated controls. Good zoning and demand led services solutions.
    c. Application of On-site Low and Zero Carbon technologies. LZC technologies located directly on the site or integrated into the building shall satisfy the energy betterment requirements over and above the BRUKL output documentation referenced in GD01 – Low Energy Design, whilst achieving the carbon offset requirements of Building Regulations Pt. L.
    d. Consideration of use of low carbon grid electrical power for heating via high efficiency plant selections with COP.
    e. All the above considered on a life cycle analysis.
4. A project specific TM54 energy assessment shall be conducted for all developments including refurbishment projects to demonstrate to the University the demonstrable energy benefits of the proposed servicing philosophy at concept stage of the project. It will need to be undertaken at the earliest project stages and subsequently updated at every project stage.
5. The current Leicester City Council's local planning policy must be consulted and the scheme must demonstrate compliance with the same.
6. The University has no implicit requirement to connect to the local city District Heating network despite the planning preference. It must be noted that the City Energy network is currently not as carbon efficient as would be liked and it must be recognized that other forms of heat energy may be of lower carbon content.

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The services engineer should adequately demonstrate the options available to the University on a project by project basis that still satisfy the requirements of the local city planners. Particular attention shall be given to the efficiency, energy cost, carbon use and cost and lifecycle costing of the proposals first and foremost and shall be provided for all projects. The University shall be consulted in relation to all district heating connections prior to consultation with the local authority regarding energy and low carbon design philosophy.

7. In regards to sustainability the development shall demonstrate

    a. The Building Design Gide section 8 gives further details of carbon management and future climate adaptation.

    b. How the development will maximise an efficient use of resources, including minimising waste and maximising recycling/re-use of materials through both construction and occupation.

    c. How the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer-term resilience specifically in terms of:

    d. The water environment (use of sustainable drainage systems (SuDS), flood proofing measures and the design of new buildings to minimise water demand)

    e. Energy (future adaptability including passive solar design and mitigating the risk of over-heating).

8. The building services engineer's energy assessor, responsible for appraising the design concept dynamic simulation modelling shall ensure that an optimum balance is achieved in helping the University in meeting their carbon and energy reduction commitment. For further guidance please refer to GD01 – Low Energy Design and GD04 – LZC & Renewable technologies plus the MS and ES series of design guides.
9. All sustainable and renewable technology design guidelines contained herein shall be read in conjunction with the University of Leicester's Carbon management strategy.
10. The University's requirement for on-site LZC renewable generation shall be that a minimum of 30% of the project **ENERGY** demand needs to be provided by a sustainable means. Options are discussed within guide GD04. This shall be strictly assessed in accordance with the energy hierarchy detailed within this guide, focusing on demand minimisation first and foremost.
11. As part of the passive sustainable design appraisal, consideration shall be given to phase change materials (PCM's) and how thermal comfort may be achieved with the most efficient use of energy possible.

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