

Title: Whole Life Carbon Assessment Report

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1 Objective

- 1.1 To measure the embodied carbon in new buildings and estimate carbon emissions in use.
- 1.2 To assess the cost vs carbon benefits.
- 1.3 To make the most cost-effective improvements and decisions, and provide different options
- 1.4 To develop officers' knowledge of systems and construction methods, etc. to deliver zero carbon projects.
- 1.5 To provide support to teams involved in new build housing to make decisions on construction measures and strategies in order to be able to progress towards carbon neutral dwellings by 2030.

2 Background and context

- 2.1 New council policy aims to meet the growing climate challenges. The proposed Sustainability Policy aims to meet the LETI / RIBA Climate Challenge targets (including the embodied carbon in the materials and processes used to construct, as well as the operational energy and the carbon produced by buildings in operation). Without these considerations, it will not be possible to achieve net zero carbon in new build housing.
- 2.2 LETI and RIBA have both published documents with targets and checklists for achieving net zero carbon in new construction projects. These are the RIBA Climate Challenge Checklist and LETI's 10-step guide to achieving operational carbon neutrality. Both organisations recommend carrying out Whole Life Carbon Assessments as the key to achieving net zero carbon in new build projects by 2030.
- 2.3 Considerations include (but are not limited to):

- Construction methods
- Construction materials
- Locality of materials
- Energy systems (e.g. heating systems)
- Durability, flexibility and adaptability of design proposals
- Connections to wider infrastructure
- Existing site conditions and opportunities/ challenges posed
- Deconstruction/ end of life
- Design for energy efficiency e.g. air tightness, orientation of buildings etc.

2.4 To explore the areas above and achieve net zero carbon, existing consultants e.g. structural engineers, quantity surveyors and architects will have a wider brief, and new consultants such as environmental engineers will be required. It would also be of benefit to have a Whole Life Carbon Advisor to oversee the energy strategy of the projects and, alongside the architects, manage the other consultants' roles in achieving net zero carbon.

3 Proposal

3.1 Engage a Whole Life Carbon Advisor to:

- Oversee the energy strategy of the projects and assist BHCC to develop a site-wide carbon strategy. The strategy will propose a delivery method that will provide the best outcome for the most carbon effective route vs cost.
- Manage the other consultants' roles in achieving net zero carbon including; structural engineers, energy assessors / environmental engineers, quantity surveyors, as well as any additional roles such as landscape designers etc.
- Produce a written review on Whole Life Carbon for different design options in relation to the existing site conditions (options for lowest embodied carbon, and considerations for lowest predicted carbon in use).
- Advise on the overall design approach of the new structures proposed for the site i.e. efficiency and form, wall to floor ratio, and construction methodology.

3.2 Time – The whole life carbon advisor will have input from RIBA stages 0 to 6 [strategic definition to handover], overseeing the process and ensuring that the 'Actions by RIBA stage' are met [see pages 114 and 115 of 'LETI Climate Emergency Design Guide']. We do not foresee Whole Life Carbon Assessments [WLCA] adding a significant delay to the program. WLCA fits into our committee timetable to be able to report on cost options for different carbon saving strategies.

3.3 Cost – We propose a pilot project to identify the costs of the WLCA, and uplift in costs from additional work done by consultants e.g. for additional surveys, measurements, and modelling. We have already received a quote from a whole life carbon assessor for the Moulsecoomb Masterplan project. However, we do not yet know what the overall uplift in consultants' costs will be and that is one of the next steps.

- 3.4 Aside from officers attending meetings with the whole life carbon assessors, we do not foresee there being an additional cost related to officers' time.
- 3.5 Other consultants such as engineers, quantity surveyors, ecologists, landscape architects etc. will be required to do additional work towards achieving net zero carbon. Their additional level of involvement will become clearer through a pilot project; however, these costs will vary with each individual project.
- 3.6 Benefits:
- Enables and supports the Council in achieving their objective of becoming carbon neutral by 2030 through enabling measurement of carbon on projects.
 - A greater carbon reduction than if we did not have a WLCA.
 - Allows us to be able to track and measure carbon in order to determine which overall strategy is the most effective in reducing carbon in new housing (embodied and operational).
 - Enables us to explore different options and determine the relative carbon vs cost benefits; including end of life of our buildings and deconstruction.
 - Allows us to optimise the relationship between embodied and operational emissions.
 - Will allow the architecture team and other council officers to become more confident in the steps and decisions involved in becoming carbon neutral – through the whole life carbon assessor's knowledge and experience.
 - Enables us to share information on what we've learnt with the wider construction industry for the benefit of the city as a whole. Including informing good practice on future projects (housing and others i.e. commercial, education, office etc). This can support the Planning service and Building Control, and demonstrate an innovative, best practice approach to other LA's as well as other council departments.
- 3.7 Risks – a whole life carbon advisor may not be a viable option on smaller projects in terms of cost as there are cost efficiencies in developing larger sites.
- 3.8 Opportunities:
- To empower and enable staff and designers in the council working with whole life carbon assessors to work in new ways which progress towards achieving net zero carbon on new housing projects.
 - Provides an experienced knowledge base and resource to the Council for queries and advice on carbon neutral design for any future projects. This enables an avenue of opportunity beyond measurement.
 - Allows for pilot projects to begin imminently -where carbon emissions and embodied carbon can be measured and where carbon-focused decisions can start to be made within projects. Staff would otherwise require a lot of upfront training in order to begin designing and delivering carbon neutral projects. A WLCA would therefore speed up the delivery of pilot projects.
 - Knowledge and data sharing.

- Successful pilot projects within new build housing will set a precedent for tackling carbon emissions within other parts of the council e.g. existing housing stock, transport etc.

- 3.9 We have explored other options, and we don't feel the architecture team could currently take on the role of driving zero carbon design on new build housing.
- 3.10 Significant specialist knowledge and training is required to deliver zero carbon projects and achieving this is particularly difficult with current demands on time with existing projects). We feel an external consultant such as a whole life carbon assessor would be required to assist and advise with developing net zero carbon strategies on projects going forward. Without this, we cannot know what carbon is emitted or embodied in our buildings, therefore we can't progress towards achieving net zero carbon with new build housing.

4 Next steps

- 4.1 Select a pilot project e.g. Moulsecoomb Masterplan. The Moulsecoomb Masterplan site has cost efficiency benefits due to its scale and would provide opportunities to explore strategies and measure carbon emissions in housing, offices, community use and retail. The timings allow a whole life carbon assessor to engage with this project if agreement is given in the near future.
- 4.2 Brief and get feedback from delivery partners (Strategic Partnership).
- 4.3 Obtain quotes and proposed scopes of work from the consultants who will be involved in providing additional work, and consider what the uplift in cost is between our previous methods of working (on new build housing projects), and the new approach (prioritising net zero carbon).
- 4.4 Arrange staff training on the basic principles of carbon reduction strategies, and how the design process will need to adapt to align with the RIBA's new guidance.
- 4.5 Consider the way in which we are delivering our projects as this may need to change e.g. the time scales and how they correlate with when decisions need to be made about structure, heating systems etc. with wider Housing Service / client teams in council.
- 4.6 Consider and discuss internally the current architectural design process, as this may need to change; e.g. considering the deconstruction (end of life) of our buildings early on and the possibility of creating 'material passports'. Also, how and when we engage with the Strategic Partnership.
- 4.7 Consider how zero carbon measures can be tied in with other council projects e.g. improving biodiversity and moving towards a more circular economy, in line with the emerging Brighton & Hove Circular Economy Routemap.