BURO HAPPOLD

Design Note

Project Thameside West
Subject Whole Life Carbon
Project no 0035668
Date 3 July 2020

Revision	Description	Issued by	Date	Approved (signature)
01	Final	TK	03/07/2020	

1 Introduction

A whole life carbon assessment was carried out as part of the Greenhouse Gas Emissions Chapter for the Thameside West environmental statement (ES). This has been updated a number of times based on updated scheme and design information, as reported in addendums to the ES. Since it was first assessed guidance on carrying out a whole life carbon assessment has been issued by the GLA in the 'Intend to Publish' London Plan. This design note demonstrates the alignment between the new guidance from the GLA and the assessments that have been carried out for and reported in the ES (as amended). In particular, this note responds to the following request from the GLA:

> *Policy SI 2: Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.*

2 Calculation of whole life carbon emissions

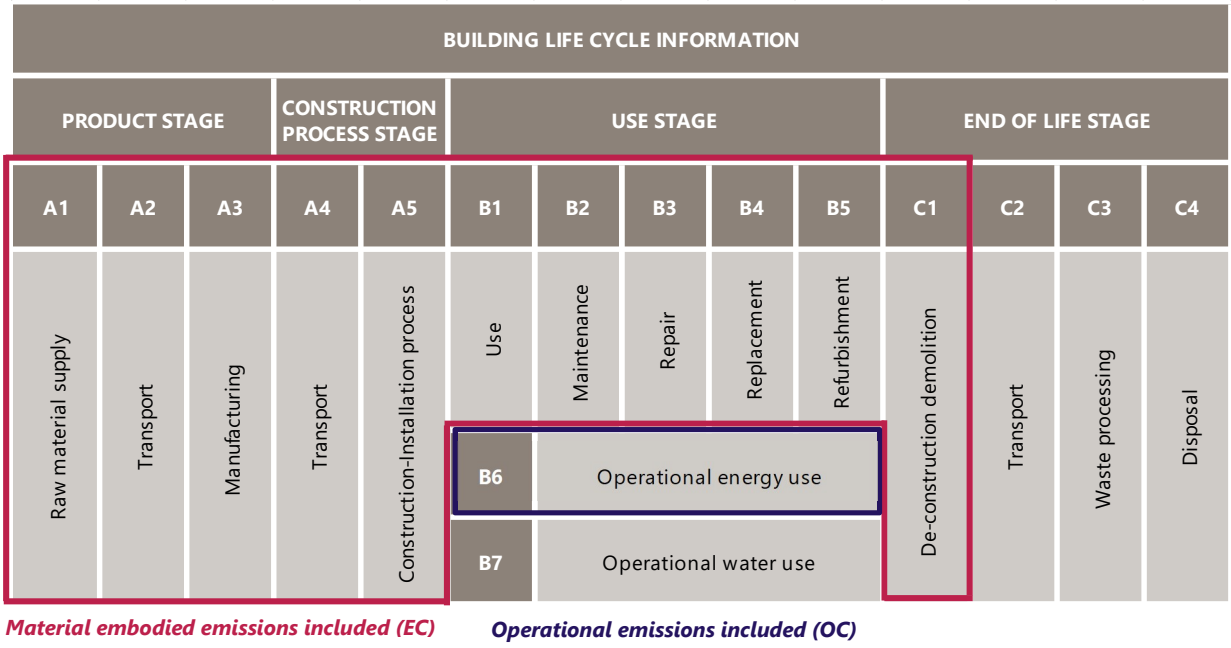
2.1 Methodology

Buro Happold has carried out an assessment of whole life cycle carbon emissions. The assessment follows guidance set out in the following nationally recognised Whole Life-Cycle Carbon Assessment methodologies:

- Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017); and
- Methodology to Calculate Embodied Carbon by the Royal Institution of Chartered Surveyors (RICS, 2014).

The study includes EN 15978 Life Cycle Assessment (LCA) standard modules A1 to C1 (British Standards Institution, 2011a), as illustrated in Table 2—1 as well as module B6. The pre-consultation guidance issued by the GLA requires calculation of all modules (i.e. including B7 and C2-C3). We had originally excluded B7 and C2-C3. We excluded B7 because water use is tracked elsewhere in the Sustainability statement. We excluded C2-C4 because of the difficulty of predicting end of life outcomes in a meaningful way.

Table 2—1 Building life cycle assessment stages.



2.2 Results

The calculated Whole Life Carbon for Thameside West can be seen in Table 2—2; for full details of the calculation refer to the Environmental Statement.

Table 2—2: Whole life carbon emissions calculated for three emissions scenarios

Scenario	Total EC (tCO_{2e})	Total OC (tCO_{2e})	Normalised embodied carbon ($kgCO_{2e}/m^2$)
Low	598,411	170,802	1,621
Medium	664,735	206,845	1,801
High	731,060	242,889	1,981

3 Actions taken to reduce life cycle carbon emissions

The following actions have been or will be taken to reduce carbon emissions:

- Embodied carbon
    - Measure embodied GHG emissions by undertaking a sequential assessment from RIBA stage 2 to post construction for each phase;
    - Use less or alternative materials and design to maximise useful lifetime: facade, structural, building services engineers and architects to undertake hot spot studies following the appropriate guidance or using IMPACT compliant tools;
    - Cement replacement: the structural engineer is to review and maximise structural design by undertaking a hot spot study (Figure 3—1 shows the options that could be analysed by the structural engineer);
    - Public realm: Use low impact binder for pavements and roads (e.g. vegetable based binder or industrial by products);
    - Transport: investigate using local material and alternative transport options (i.e. barge) for bulky unprocessed products (such as aggregate, infill and soils); and
    - Reduce construction impacts; the contractor is to use responsible construction practices and monitor all energy and transport emissions.

    Further details of measures to reduce embodied carbon can be found in the Circular Economy Statement.

- Operational carbon
    - Design using lean, clean and green principles: building services engineers are currently following this approach as per Building Regulations and London Plan policy requirements.
    - Review Low and Zero Carbon (LZC) technologies; building services engineers have carried out a feasibility study to establish the most appropriate recognised local low or zero carbon energy source.
    - Climate change risk assessment; an assessment to assess the impact of future weather on energy consumption and thermal comfort will need to be adopted.

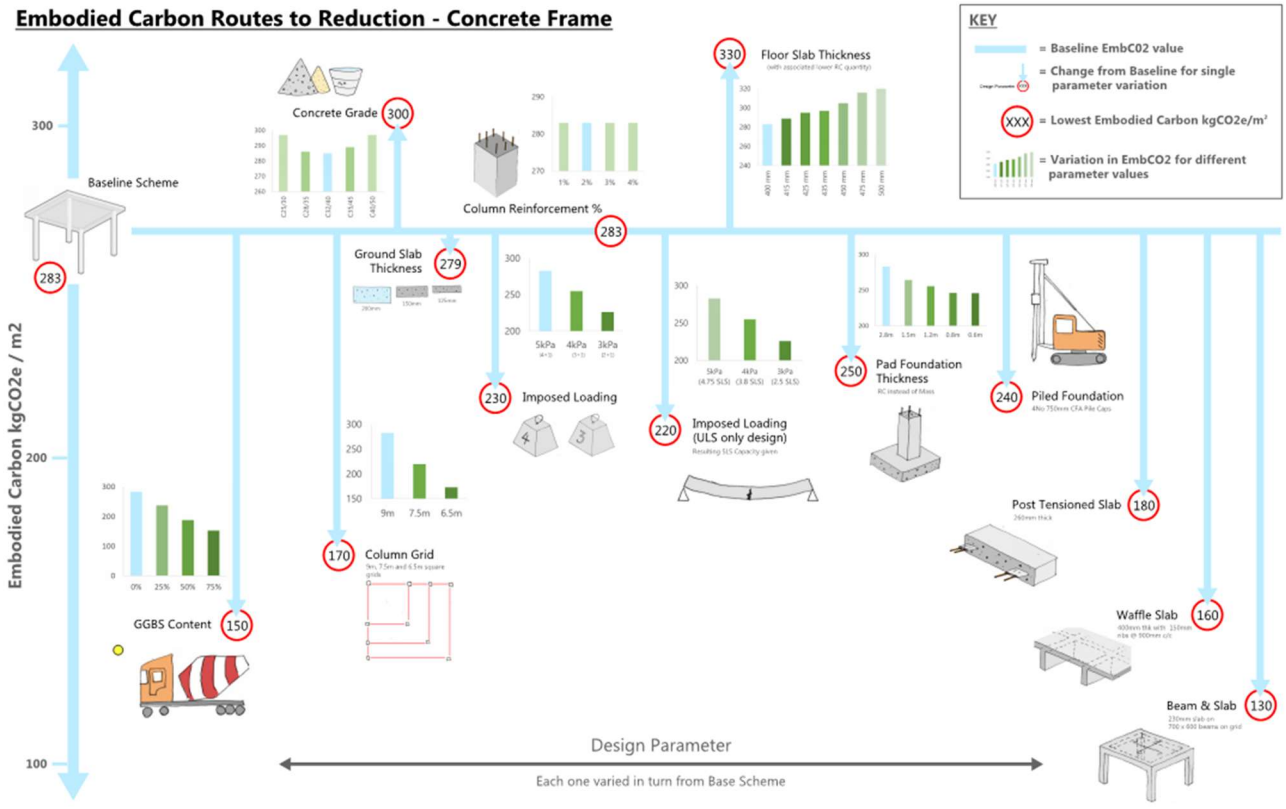


Figure 3—1: An example of options for optimising the embodied carbon of the concrete frame.