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Technical Review of 'Life Cycle Carbon Analysis of Extensions and Subterranean Development in RBK&C' – Eight Associates, February 2014

Executive Summary

- The purpose of this report is a technical review of the claims made in '*Life Cycle Carbon Analysis of Extensions and Subterranean Development in RBK&C'* produced by Eight Associates in February 2014. The report was produced to support the proposed changes to planning policy within the Royal Borough of Kensington and Chelsea (RBKC).

- This report is in reference to paragraph 34.3.53 of RBKC 'Basements Policy Publication Final', which states that *"the carbon emissions of basements are greater than those of above ground developments per square metre over the building's life cycle. This is because of the extensive use of concrete which has a high level of embodied carbon. In particular multi storey basements are more carbon intensive when compared to above ground extensions or single storey basements during their life cycle. Limiting the size of basements will therefore limit carbon emissions and contribute to mitigating climate change."*

- This report demonstrated through the use of more appropriate project assumptions that this statement is misleading. Of the sixteen case studies presented by Eight Associates, two have been re-calculated by Waterman based on more accurate site specific data.

- This report has determined the following key points:

    1. The embodied carbon from the case studies used has been recalculated and determines that basement developments emit less carbon over a 60 year lifespan than an above ground extension;
    2. The use of BREEAM Green Guide to Specification Rating embodied energy figures has led to an inaccurate classification of materials, and an over estimating in embodied carbon;
    3. Waste figures for materials have been doubled counted by Eight Associates, leading to an increase in embodied carbon figures;
    4. The calculation methods used by Eight Associates have not been standardised throughout the calculations, therefore, direct comparisons cannot be made over the sixty year period;
    5. Energy upgrades to the existing developments have been included, thus masking the true impact of both basements and extension; and
    6. The methods of basement construction used has not been assessed by Eight Associates, therefore, the carbon generated at the phase of development has influenced the results.

- On the basis of our technical review of the Eight Associates report, it is considered that there are significant number of issues for debate surrounding the calculation of the lifecycle carbon of both the basement and the extension. Our conclusion is that the statement made in paragraph 34.3.53 of RBKC's Basements Policy Publication Final is based on inconsistent and inaccurate lifecycle carbon calculations and the Eight Associates report is not considered to present a sound basis for such an argument. Further, more detailed analysis is recommended.