



ROYAL ARSENAL RIVERSIDE  
THE ROPEYARDS  
PLOTS D & K

WHOLE LIFE CYCLE CARBON ASSESSMENT

To Support a Reserved Matters  
Application

MARCH 2024



**HODKINSON**



**Whole Life Cycle  
Carbon Emissions  
Assessment**

Berkeley Homes (East Thames) Ltd

# **The Ropeyards**

Final

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BSc (Hons)

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## DOCUMENT CONTROL RECORD

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We are able to advise at all stages of projects from planning applications to handover.

Our emphasis is to provide innovative and cost-effective solutions that respond to increasing demands for quality and construction efficiency.

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## Executive Summary

This Whole Life Cycle Carbon Emissions (WLCCE) Assessment for the proposed development at The Ropeyards, Royal Arsenal Plots D & K ( Buildings D1, D2, D3, D4, D4 and K3, K4, K5 )in the Royal Borough of Greenwich, has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Berkeley Homes (East Thames) Ltd.

The proposed development will comprise of 663 residential units and 959.1 sqm of non-residential floorspace within Plots D and K3, K4, K5, and revised landscaping details.

National Building Regulations and the Mayor’s net zero-carbon target for new development account for a building’s operational carbon emissions. As methods and approaches for reducing operational emissions have become better understood, and as targets have become more stringent, these emissions are now beginning to make up a declining proportion of a development’s carbon emissions. Attention now needs to turn to WLCCE to incorporate embodied carbon emissions, enabling a better understanding of the environmental impact of the proposed development.

WLCCE are the carbon emissions resulting from the construction and the use of a building over its entire life, through four stages described as life-cycle modules, as shown in Figure i;

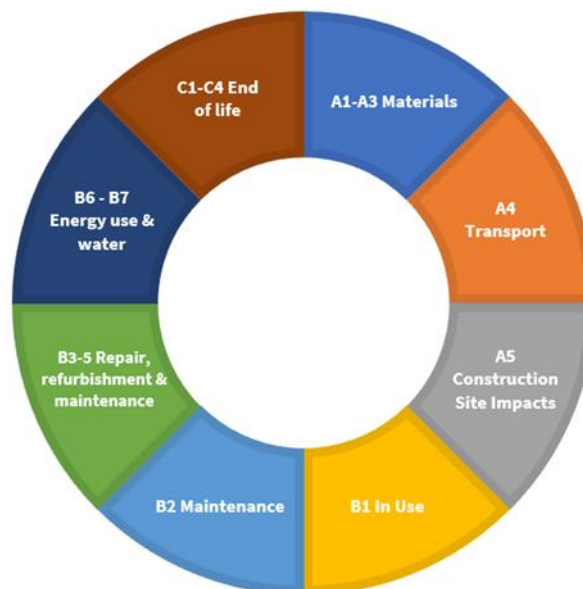


Figure i: Life cycle modules included within WLCCE assessment

They capture a building’s operational carbon emissions from both regulated and unregulated energy use, as well as its embodied carbon emissions. Embodied emissions are those associated with raw material extraction, manufacture and transport of building materials, construction and the emissions associated with

maintenance, repair, and replacement as well as dismantling, demolition, and eventual material disposal. The assessment provides a picture of a building’s carbon impact on the environment.

This WLCCE assessment is being undertaken in compliance with London Plan 2021 Policy (SI 2), the methodology has followed the principles of BS EN 15978 and has used both the GLA guidance and RICS as the methodology for assessment. This has been facilitated through the use of GLA approved One Click LCA software.

The following table outlines the assumptions made within this WLCCE assessment:

**Table i: WLCCE assumptions**

<b>Data</b>	<b>Data source</b>
<b>Material types and volumes (A1-A3)</b>	Following a detailed review of all material inputs with the design team, it is assumed at this stage that 95% of the cost allocated to each building element has been accounted for. This will be formally verified in the next stage of works once a cost plan has been produced.
<b>Transport data (A4)</b>	Default values provided by One Click.
<b>Construction site impacts (A5)</b>	Construction value provided by applicant and baseline target provided by BRE. Waste estimates were provided by the Applicant.
<b>Refrigerants (B1)</b>	No refrigerant based heating or cooling systems are proposed. There will be a degree of localised VRF and DX cooling for commercial & amenity areas as confirmed by Buro Happold.
<b>Maintenance (B2)</b>	B2 emissions have been calculated at 10kgCO <sub>2</sub> /m <sup>2</sup> , as per GLA guidance.
<b>Repair and Replacement data (B3-B4)</b>	An assumption has been made based on GLA guidance that assumes B3 emissions are 25% of the total B2 emissions for the site. Default values provided by RICS and One Click EPD database for products inputted into software for B4 emissions.
<b>Refurbishment (B5)</b>	At present One Click does not have ways to consider B5 emissions. However, based on the information provided for B3 and B4 it is likely that these have emissions have been accounted for.
<b>Operational energy (B6)</b>	Energy calculations based on Energy calculations by Hodkinson Consultancy (February 2024).
<b>Operational water (B7)</b>	Water consumption based on Building Regulations Part G ‘Enhanced Consumption’ of 110 l/pp/d and multiplied by the intended full occupancy of the development.

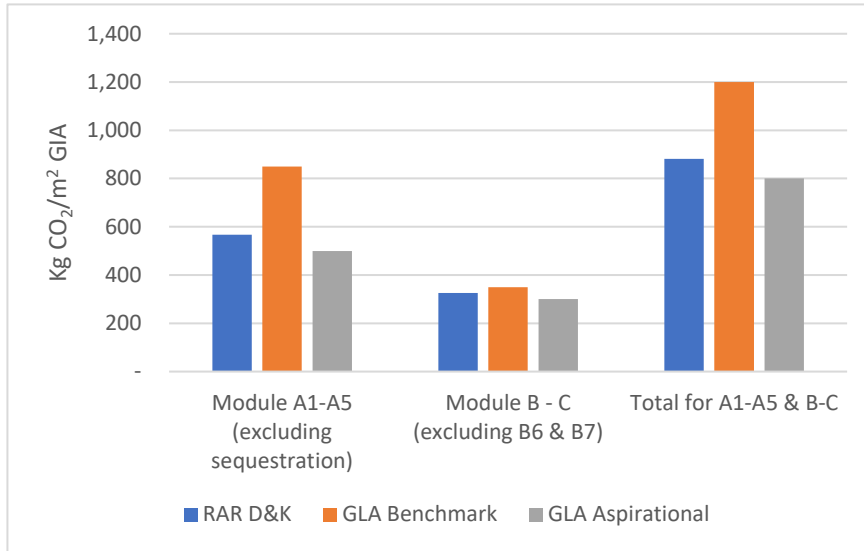
Data	Data source
<b>End of life (C1-C4)</b>	Default values provided by One Click based on the information within the EPD database.
<b>Building areas</b>	Building areas were provided by the architect in the accommodation schedule 65,636 m <sup>2</sup>
<b>Number of occupants</b>	Approx 1,986 based on accommodation schedule provided by PRP (November, 2022)
<b>Assessment period</b>	60 years

The total emissions, based on the GLA guidance is **896 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years excluding sequestered carbon or 885 kgCO<sub>2</sub>/m<sup>2</sup> when sequestered carbon is included.**

- > 567 kgCO<sub>2</sub>/m<sup>2</sup> for modules A1-A5 (excluding sequestered carbon).
- > 329 kgCO<sub>2</sub>/m<sup>2</sup> for modules B-C.

When operational energy and water emissions are included in the calculation above the total emissions are expected to be **1,151 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years.**

The proposed development is performing better than GLA benchmarks for all modules and is therefore compliant with London Policy SI 2. The results demonstrate that the development has taken account of relevant policy and reduced emissions as far as reasonably possible based on current information available, as shown in Figure ii.



**Figure ii: Total kgCO<sub>2</sub> /m<sup>2</sup> Gross Internal Floor Area (GIA) performance compared to GLA Benchmarks**

A series of high-level opportunities to further reduce carbon emissions post planning have also been made. These measures will be looked at in detail in the next stage of the design development process and included, where possible.

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## 1. INTRODUCTION

- 1.1 This Whole Life Cycle Carbon Emissions (WLCCE) Assessment for the proposed development at The Ropeyards, Royal Arsenal Plots D&K within the Royal Borough of Greenwich has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Berkeley Homes (East Thames) Ltd.
- 1.2 The proposed development will comprise of 663 residential units and 959.1 sqm of non-residential floorspace within Plots D and K3, K4, K5, and revised landscaping details.
- 1.3 The purpose of this WLCCE assessment is to demonstrate that the proposed development at The Ropeyards has undertaken an initial assessment based on the information available to date which will need to be updated as the project progresses.
- 1.4 National Building Regulations account for a building's operational carbon emissions. As methods and approaches for reducing operational emissions have become better understood, and as targets have become more stringent, these emissions are now beginning to make up a declining proportion of a development's carbon emissions. Attention now needs to turn to WLCCE to incorporate embodied carbon emissions, enabling a better understanding of the environmental impact of the proposed development.
- 1.5 The assessment of the proposed development endeavours to help the design team understand, at concept design stage, the lifetime consequences of their design decisions. This report should be read in conjunction with the '*GLA Whole Life Carbon Assessment Template*' which has been submitted alongside this application.

## 2. DEVELOPMENT OVERVIEW

### Site Location

- 2.1 The proposed development is located on the Land between Duke of Wellington Avenue and Beresford Street, London, SE18 6NP, as shown in Figure 1 below.

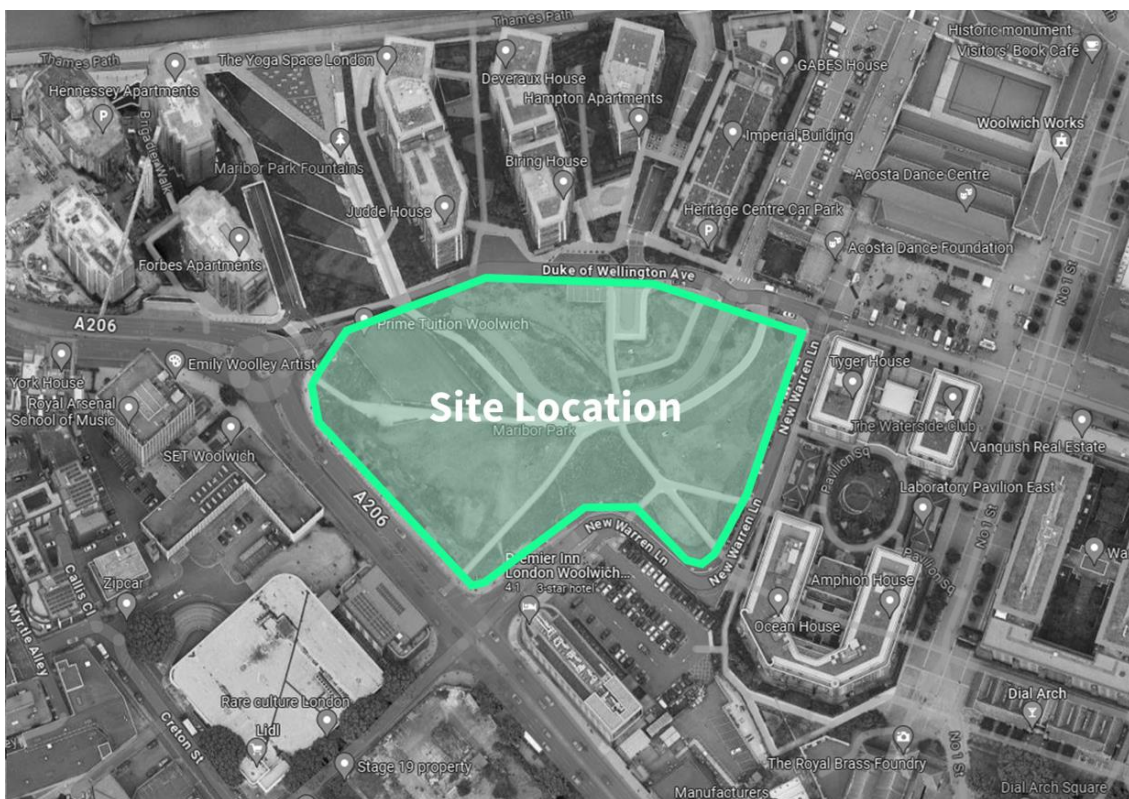


Figure 1: Site Location

### Proposed Development

- 2.2 The proposed development is described as follows:

*“Submission of Reserved Matters (Appearance, Landscaping, Layout and Scale) pursuant to Condition 2 of planning permission reference 16/3025/MA, dated 17.03.2017, for residential units and non-residential floorspace within Plots D and K, along with public / private landscaping details, car / cycle parking, refuse / recycling facilities and play provision”.*

- 2.3 The Site is located on the western edge of the wider Royal Arsenal Riverside masterplan and is approximately 2.3 ha. The Site currently sits on a temporary park and is bound to the south by the

A206, the RAR A & B Blocks to the north (and north east) and RAR Phase 3, the Brass Foundry and The Guard House to the west.

**2.4** Beyond the immediate site boundaries, to the north of the site is the River Thames and to the south and south east of the site is Woolwich Town Centre including the main shopping area along Powis Street, General Gordon Square, the Woolwich Arsenal Overground Train Station and the Woolwich DLR Station.

**2.5** Figure 2 below illustrates the proposed site layout.



**Figure 2: Proposed Sitewide Ground Floor Plan (PRP, February 2024)**

**2.6** The total Gross Internal Floor Area (GIA) for the proposed development is 65,636 m<sup>2</sup>. The principles noted within this report apply to this GIA.

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## 3. POLICY AND REGULATIONS

### Regional Policy: The London Plan

#### London Plan (2021)

**3.1** The London Plan sets out an integrated economic, environmental, transport and social framework for the development of London. The following policies are considered relevant to the proposed development and this Statement:

**3.2 Policy SI 2 Minimising Greenhouse Gas Emissions, states:**

*‘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:*

*Operational carbon emissions will make up a declining proportion of a development’s whole life-cycle carbon emissions as operational carbon targets become more stringent. To fully capture a development’s carbon impact, a whole life-cycle approach is needed to capture its unregulated emissions (i.e., those associated with cooking and small appliances), its embodied emissions (i.e., those associated with raw material extraction, manufacture and transport of building materials and construction) and emissions associated with maintenance, repair and replacement as well as dismantling, demolition and eventual material disposal). Whole life-cycle carbon emission assessments are therefore required for development proposals referable to the Mayor. Major non-referable development should calculate unregulated emissions and are encouraged to undertake whole life-cycle carbon assessments. The approach to whole life-cycle carbon emissions assessments, including when they should take place, what they should contain and how information should be reported, will be set out in guidance’.*

#### Guidance Documents

**3.3** Guidance has been released by the Greater London Authority “*Whole Life-Cycle Carbon Assessments guidance – March 2022*”. It outlines how to prepare a WLCCE assessment which should accompany all referable Planning Applications in line with London Plan Policy SI 2 ‘*Minimising Greenhouse Gas Emissions*’.

**3.4** The guidance is accompanied by an assessment template, which provides separate tabs outlining the information that should be submitted at each stage. This template has been provided as a standalone document which should be read in addition to this assessment report.

**3.5** In addition, the following guidance is available to conduct assessments:

- > **BS EN 15978:2011** - *Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method.*
- > **ISO 14040:2006** - *Environmental management – Life cycle assessment – Principles and framework.*
- > **RICS Professional Statement Whole life carbon assessment: 2017** - *Whole life carbon assessment for the built environment.*

**3.6** Further planning reports submitted alongside this report will also be used and/or referenced within this assessment, including:

- > Energy Statement- Hodkinson (February, 2024).
- > Circular Economy Statement- Hodkinson (February, 2024).

## Local Policy: Royal Borough of Greenwich Urban Design SPD

**3.7** The Urban Design Supplementary Planning Document (SPD) supports the Royal Borough of Greenwich’s Local Plan. It is a formal supplement to the adopted Local Plan and forms part of the material considerations in decision-making on planning applications. The following principles are considered relevant to this WLCCE assessment:

*Principle B.12: Reducing Carbon Impact highlights that major developments should be designed to net zero standards and set out principles for reducing carbon impact over the full life cycle of the development from conception to end of life/reuse.*

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## 4. WHOLE LIFE CYCLE CARBON EMISSIONS ASSESSMENT

**4.1** Undertaking WLCCE assessments is a way to fully understand and minimise the carbon emissions associated with building designs over the entire life cycle of the building. This will be done at the proposed development to quantify the WLCCE that will be released, considering not only operational and embodied emissions but also demolition, construction, and refurbishment and replacement cycles.

**4.2** The London Plan has introduced a requirement (Policy SI 2 ‘*Minimising Greenhouse Gas Emissions*’) for all new referable developments to calculate and reduce WLCCE, this is both embodied and operational carbon:

- > **Operational carbon** is the energy required to heat and power a building;
  - > **Embodied carbon** is the carbon that is released in the manufacturing, production, and transportation of the building materials used.
- 4.3** In addition to the two metrics above there are additional life cycle stages that are considered during WLCCE assessments, these include demolition, end of life and refurbishment/replacement cycles.
- 4.4** The two metrics (operational and embodied) and the additional life cycle stages, as noted above, have been included in this WLCCE assessment as per GLA guidance.
- 4.5** Undertaking a WLCCE assessment provides a full overview of the material and construction of a building using science-based metrics whilst also identifying the overall best combined opportunities for reducing lifetime emissions, and also helps to avoid any unintended consequences of focusing on operational emissions alone.

## Methodology

- 4.6** WLCCE assessments are sensitive to changes in design and specification and therefore detailed design will impact the results as the scheme progress. As noted in the GLA guidance, WLCCE assessments should be conducted at the following stages in order to maximise design efficiencies:
- > Pre application;
  - > Stage 1 submission (RIBA 2/3);
  - > Post construction (RIBA 6).
- 4.7** This assessment is considered to be the Stage 2 submission and has been completed for the proposed development using the drawings and schedules provided by PRP Architects and energy calculations from the Energy Statement submitted for planning (Hodkinson, February 2024).
- 4.8** A set of WLCCE benchmarks have been developed by the GLA in which applicants are required to compare against their own results as part of the assessment and which the GLA will refer to in its review of these assessments. An 'aspirational' set of benchmarks have also been devised for applicants that wish to go further. Both sets of benchmarks are included in this assessment and are being reported on.

## Study Period

- 4.9 The reference study period (RSP) is 60 years, this is based on the principles outlined in BS EN 15978: 2011, section 7.3 and the RICS guidance. RSPs are fixed to enable comparability between whole life carbon results for different projects. It ensures that the assessment is representative of typical service life of different building elements.

## Operational Carbon

- 4.10 Operational energy is the inputted energy required for all heating and power needs. It can be split into two variants:
- > **Regulated emissions** are assessed using the Government's approved methodology for Building Regulations Part L compliance, the Standard Assessment Procedure (SAP) for residential units and Simplified Building Energy Model (SBEM) for commercial spaces and
  - > **Unregulated emissions** are energy use as a direct result of user behaviour. This includes cooking, white goods (fridges, washing machines, etc), and plug-in electrical loads (televisions, laptops, lamps, etc).
- 4.11 Both of the above elements have been accounted for in this WLCCE assessment, these were provided by the calculations completed for the Energy Statement submitted for planning (Hodkinson, 2024). For clarity, as unregulated energy demands are largely reliant on the behaviour of occupants, they have been considered a fixed entity in the calculations in accordance with the guidance.

## Non-Residential

- 4.12 The estimated energy demand for the commercial unit has been calculated using Simplified Building Energy Model (SBEM) software, using the National Calculation Method (NCM 2021 Edition). SBEM calculates the Regulated energy demands associated with hot water, space heating and fixed electrical items, as well as unregulated energy demands. Operational unregulated energy demands associated with non-residential items outside of the commercial space (i.e. electric vehicle charging, external lighting, corridors, and lifts) are accounted for separately. They are presented as the landlord's energy demands at the Be Seen stage, in line with the London Plan Energy Hierarchy.
- 4.13 A sample shell only SBEM calculation has been carried out on the commercial unit. The sample calculation has been extrapolated to gain energy demand estimates representative of the total area to be provided.
- 4.14 Due to the size of the non-residential spaces and the shell-only nature of these, full modelling under TM54 has not been undertaken. It has been deemed appropriate by specialists that SBEM modelling provides adequate results for non-residential unregulated energy demands.

## Residential

- 4.15** The estimated annual energy demand for the residential portion of the development has been calculated using Standard Assessment Procedure (SAP) methodology. SAP calculates the Regulated energy demands associated with hot water, space heating and fixed electrical items.
- 4.16** SAP calculations have been carried out for representative home types. These encompass houses and exposed floor, mid floor, top floor and corner flats, at different orientations, and therefore represent a fair aggregation of the unit mix of the site.
- 4.17** To provide energy demands across the entire site, the accommodation schedule has been used to extrapolate the energy performance across the whole application area.
- 4.18** The unregulated energy demands, discussed further in *Be Seen*, for the residential units have been calculated using the methodology outlined in the SAP 10.2 document. This calculates the CO<sub>2</sub> emissions associated with appliances and cooking and are calculated using the BRE methodology.

## Embodied Carbon

### One Click LCA

- 4.19** OneClick LCA is the software that has been used to conduct the WLCCE assessment. This is a web-based piece of design software for buildings and infrastructure approved for use by the GLA.
- 4.20** OneClick LCA consists of a large database of generic and average Life Cycle Indicator (LCI) data, and global Environmental Product Declaration (EPDs). The most suitable option for each material (where available) was chosen from the database in OneClick. The material LCI data has been chosen to be representative of the typical UK supply chain.



4.21 The life cycle stages (or modules) included within the WLCCE assessment as standard are shown in Figure 3 below:

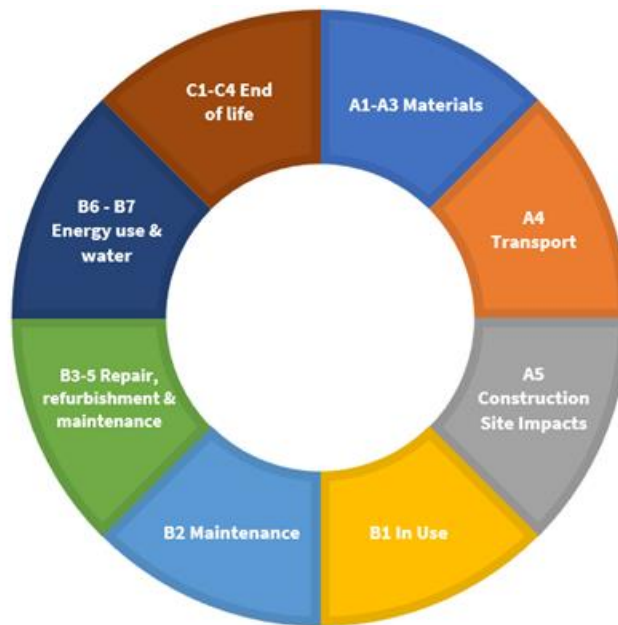


Figure 3: Life cycle modules

## Construction Impacts

4.22 In addition to embodied carbon in the materials used for construction, greenhouse gas (GHG) emissions will be created by transportation of materials to site and operation of onsite plant and machinery. Guidance from RICS indicates 1.4 tonnes of CO<sub>2</sub>e per £100,000 of project value, this is further referenced and approved by the BRE. The project value has been provided by the Applicant, which has allowed the construction transport GHG emissions to be included.

## Potable Water Use

4.23 The carbon impact associated with water use during the operation of the proposed development is also required to be reported, in accordance with the RICS guidance. Water consumption is based on Building Regulations Part G 'enhanced consumption' of 110 litres/per person/per day (including external water use) and multiplied by the intended full occupancy of the development annually.

4.24 Approximately 1,986 occupants have been assumed based upon the expected number of residents on site as per the Accommodation Schedule. This gives an estimated annual water consumption of **79,737 m<sup>3</sup>** for the entire development for 60 years.

## Carbon Sequestration

4.25 Sequestered carbon in timber has been included in the WLCCE assessment as all timber is assumed to be sustainably sourced.

## Data Sources

4.26 The assessment has utilised multiple data sources described above and is based on the level of detail available at the current stage of design. The following data sources have been used:

Table 1: Data Sources

Data	Data source
<b>Material types and volumes (A1-A3)</b>	Following a detailed review of all material inputs with the design team, it is assumed at this stage that 95% of the cost allocated to each building element has been accounted for. This will be formally verified in the next stage of works once a cost plan has been produced.
<b>Transport data (A4)</b>	Default values provided by One Click.
<b>Construction site impacts (A5)</b>	Construction value provided by applicant and baseline target provided by BRE. Waste estimates were provided by the Applicant.
<b>Refrigerants (B1)</b>	No refrigerant based heating or cooling systems are proposed. There will be a degree of localised VRF and DX cooling for commercial & amenity areas as confirmed by Buro Happold.
<b>Maintenance (B2)</b>	B2 emissions have been calculated at 10kgCO <sub>2</sub> /m <sup>2</sup> , as per GLA guidance.
<b>Repair and Replacement data (B3-B4)</b>	An assumption has been made based on GLA guidance that assumes B3 emissions are 25% of the total B2 emissions for the site. Default values provided by RICS and One Click EPD database for products inputted into software for B4 emissions.
<b>Refurbishment (B5)</b>	At present One Click does not have ways to consider B5 emissions. However, based on the information provided for B3 and B4 it is likely that these have emissions have been accounted for.
<b>Operational energy (B6)</b>	Energy calculations based on Energy calculations by Hodkinson Consultancy (February 2024).

Data	Data source
<b>Operational water (B7)</b>	Water consumption based on Building Regulations Part G ‘Enhanced Consumption’ of 110 l/pp/d and multiplied by the intended full occupancy of the development.
<b>End of life (C1-C4)</b>	Default values provided by One Click based on the information within the EPD database.
<b>Building areas</b>	Building areas were provided by the architect in the accommodation schedule 65,636 m <sup>2</sup>
<b>Number of occupants</b>	Approx 1,986 based on accommodation schedule provided by PRP (November, 2022)
<b>Assessment period</b>	60 years

**4.27** For clarity, all assumptions made within the WLCCE assessment have been noted within this report. The assessment and comments made throughout should be taken within the context of carbon and energy use only.

## 5. WHOLE LIFE CYCLE CARBON RESULTS

**5.1** As noted above, this is an initial assessment based on the best available information which will need to be updated as the project progresses in line with GLA requirements.

### Benchmark Comparison

**5.2** The results when compared to the GLA benchmark values, as noted in the GLA guidance note “*Whole Life-Cycle Carbon Assessments guidance –March 2022*” are shown in Table 2 below:

**Table 2: Whole Life Carbon Baseline (GLA Guidance)**

	Project kg CO <sub>2</sub> /m <sup>2</sup>	WLC Benchmark	Aspirational Benchmark
Modules A1 – A5	<b>567 kg CO<sub>2</sub>e/ m<sup>2</sup> GIA</b>	<850 kg CO <sub>2</sub> e/ m <sup>2</sup> GIA	<500 kg CO <sub>2</sub> e/ m <sup>2</sup> GIA
Modules B – C (excluding B6 and B7)	<b>329 kg CO<sub>2</sub>e/ m<sup>2</sup> GIA</b>	<350 kg CO <sub>2</sub> e/ m <sup>2</sup> GIA	<300 kg CO <sub>2</sub> e/ m <sup>2</sup> GIA

**5.3** It must be noted that no benchmark has been set by the GLA for operational and energy use (life cycle stages B6-B7) due to insufficient data at present. The results for these have therefore been omitted from the totals in the graph above.

**5.4** The total emissions, based on the GLA guidance is **896 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years excluding sequestered carbon or 885 kgCO<sub>2</sub>/m<sup>2</sup> when sequestered carbon is included.**

> 567 kgCO<sub>2</sub>/m<sup>2</sup> for modules A1-A5 (excluding sequestered carbon).

> 329 kgCO<sub>2</sub>/m<sup>2</sup> for modules B-C.

**5.5** When operational energy and water emissions are included in the calculation above the total emissions are expected to be **1,151 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years.**

**5.6** A set of WLCCE benchmarks have been developed by the GLA in which applicants are required to compare against their own results as part of the assessment and which the GLA will refer to in its review of these assessments. An ‘aspirational’ set of benchmarks have also been devised for applicants that wish to go further. Both sets of benchmarks are included in this assessment are being reported on.

**5.7** The expected WLCCE are lower than the GLA WLC Benchmark for all modules, and the total emissions. This demonstrates that the development has taken account of relevant policy and reduced emissions as far as reasonably possible based on current information available, as shown in Figure 4 below:

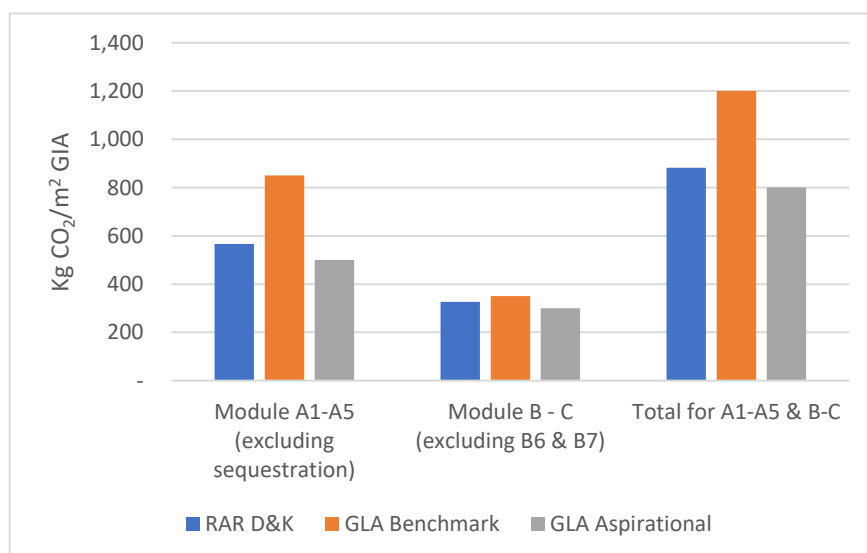


Figure 4: Total kgCO<sub>2</sub>/m<sup>2</sup> GIA performance compared to GLA Benchmarks

**5.8** These benchmarks will be subject to change as the WLCCE assessment gets updated in future. The full results are as follows:

**Table 3: Full WLCCE Results**

Category	Global warming potential	Total kgCO <sub>2</sub> e over 60 years	Total kgCO <sub>2</sub> e/m <sup>2</sup> GIA over 60 years
<b>A1-A3</b>	Construction Materials	34,323,531	546
<b>A4</b>	Transport	866,506	14
<b>A5</b>	Site operations	2,027,160	32
<b>B1</b>	In Use	NA	NA
<b>B2</b>	Maintenance	656,359	10
<b>B3</b>	Repair	164,090	3
<b>B4</b>	Replacement/Refurbishment	16,453,623	251
<b>B6</b>	Operational energy use	17,462,122	266
<b>B7</b>	Operational water use	93,772	1
<b>C1-C4</b>	End of life	4,338,949	66
	<b>Total</b>	<b>76,386,112</b>	<b>1,164</b>
	Carbon Sequestering	-748,045	-11
	<b>TOTAL</b>	<b>75,638,067</b>	<b>1,152</b>

**5.9** The above results demonstrate that **75,638 tonnes** are expected to be emitted over a 60-year period.

**5.10** The operational energy (B6) makes up 23% of the overall emissions for the proposed development; 13% for regulated energy use and 9% for unregulated use.

**5.11** Materials (A1 – A3) make up 45% of the overall emissions. There has already been a big focus on material selection which is why this percentage share is not bigger. Further focus should be given to reduce embodied carbon, especially surrounding the façade and general structure of the building.

**5.12** 4% of emissions are a result from the transport of materials to site and construction stages (A4 and A5), whilst this is small in comparison to elements it is still important to reduce transport emissions through the local sourcing of materials and to reduce consumption of energy and water during consumption, where possible.

**5.13** There are also impacts, with the in-use life-cycle module B2-B5 making up approximately 23% of all embodied carbon emissions. This is primarily due to materials that will need replacing over the 60 year study period.

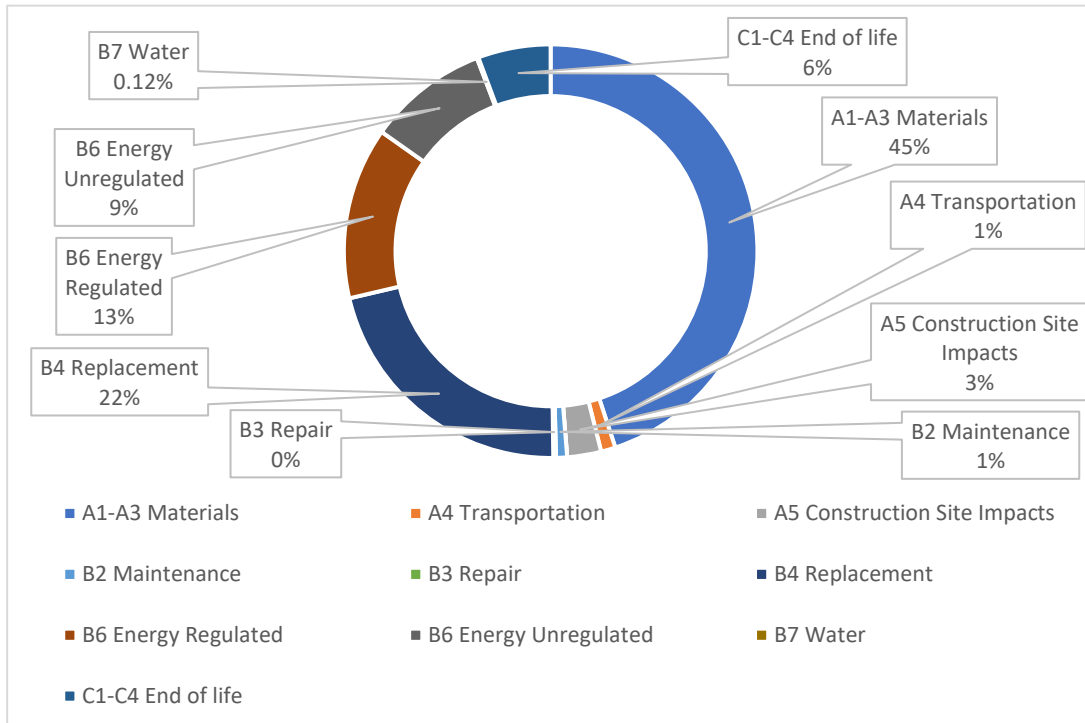


Figure 5: Total kgCO<sub>2</sub>e – Life-cycle stages

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## 6. CONCLUSION

- 6.1** This Whole Life Cycle Carbon Emissions (WLCCE) Assessment for the proposed development at The Ropeyards, Royal Arsenal Plots D & K ( Buildings D1, D2, D3, D4, D4 and K3, K4, K5 )in the Royal Borough of Greenwich, has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, appointed by Berkeley Homes (East Thames) Ltd.
- 6.2** The purpose of this WLCCE assessment is to demonstrate that the proposed development The Ropeyards has undertaken an initial assessment based on the information available to date which will need to be updated as the project progresses.
- 6.3** The total emissions, based on the GLA guidance **is 896 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years excluding sequestered carbon or 885 kgCO<sub>2</sub>/m<sup>2</sup> when sequestered carbon is included.**
- > 567 kgCO<sub>2</sub>/m<sup>2</sup> for modules A1-A5 (excluding sequestered carbon).
  - > 329 kgCO<sub>2</sub>/m<sup>2</sup> for modules B-C.
- 6.4** When operational energy and water emissions are included in the calculation above the total emissions are expected to be **1,151 kgCO<sub>2</sub>/m<sup>2</sup> GIA over 60 years.**
- 6.5** The expected WLLCE are lower than the GLA WLC Benchmark for all modules, and the total emissions. This demonstrates that the development has taken account of relevant policy and reduced emissions as far as reasonably possible based on current information available.
- 6.6** A series of high-level opportunities to further reduce carbon emissions post planning have also been made. These measures will be looked at in detail in the next stage of the design development process and included, where possible.