



# **CIS Tower, Manchester**

## **Stage 2 Whole Life-Cycle Carbon Assessment**

Miller Street, Manchester M60 0GB  
Devonshire (CIS Tower) Ltd



---

|        |                            |
|--------|----------------------------|
| Client | Devonshire (CIS Tower) Ltd |
|--------|----------------------------|

---

|          |           |
|----------|-----------|
| Revision | Issue 2.1 |
|----------|-----------|

---

|               |               |
|---------------|---------------|
| Date of issue | 09 April 2025 |
|---------------|---------------|

---

|             |               |
|-------------|---------------|
| Produced by | Natasha Sidhu |
|-------------|---------------|

---

|                           |          |
|---------------------------|----------|
| Checked and authorised by | Mat Lown |
|---------------------------|----------|

---



**Figure 1:** Identification photograph – Manchester

# Contents

|     |                                |    |
|-----|--------------------------------|----|
| 1.0 | Executive summary              | 4  |
| 2.0 | Introduction                   | 6  |
| 3.0 | Methodology                    | 9  |
| 4.0 | Results                        | 14 |
| 5.0 | Carbon Reduction Opportunities | 17 |
| 6.0 | Conclusion                     | 19 |



## 1.0 Executive summary

### 1.1 General

Devonshire (CIS Tower) Ltd, hereinafter referred to as “Devonshire Ltd, has commissioned Tuffin Ferraby Taylor (TFT) Ltd., hereinafter referred to as “TFT” to undertake a Whole Life-Cycle Carbon Assessment (WLCA) for the redevelopment of CIS Tower. The proposal seeks to maintain the heritage of the building. It retains the entrance hall extension and three storey podium, as well as integrating a level 24-25 restaurant and bar.

This assessment is undertaken at RIBA Stage 2 and provides an indication of the WLC emissions of the development and potential measures that could reduce them further. The following results summarise the WLC emissions for the design stage. The results are assuming a decarbonised scenario and include a top up factor based on the RICS guidance. As seen below, the upfront embodied carbon emissions (A1-A5, excluding sequestration) are equal to 530 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). This falls below the UKNZBCS 2026 target of 575 kgCO<sub>2</sub>e/m<sup>2</sup> for office retrofit. The life cycle embodied carbon emissions (A-C excluding B6-B7 operational carbon and including sequestration) are equal to 1000 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA).

**Table 1:** CIS Tower Carbon Emissions Summary (60 Year Reference Study Period)

|                                                                          | Upfront Carbon<br>(A1-A5)<br>(excluding<br>Sequestration) | Life Cycle<br>Embodied Carbon<br>(A-C excluding<br>B6-B7, including<br>Sequestration) | Operational<br>Energy and Water<br>Use<br>(B6-B7) | B-C embodied<br>carbon emissions<br>(excluding B6-B7<br>and<br>sequestration) | Whole Life Carbon<br>(A-C including<br>B6-B7) |
|--------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------|
| Proposed Scheme<br>(kgCO <sub>2</sub> e/m <sup>2</sup> )                 | 530                                                       | 1,000                                                                                 | 260                                               | 510                                                                           | 1,300                                         |
| UKNZCBS 2025<br>Retrofit Target<br>(kgCO <sub>2</sub> e/m <sup>2</sup> ) | 600                                                       | -                                                                                     | -                                                 | -                                                                             | -                                             |
| UKNZCBS 2026<br>Retrofit Target<br>(kgCO <sub>2</sub> e/m <sup>2</sup> ) | 575                                                       | -                                                                                     | -                                                 | -                                                                             | -                                             |

### 1.2 Carbon Reduction Opportunities

Section 5 of this report summarises the embodied carbon reduction opportunities for further investigation. In the technical design stage, the selection of MEP components should consider durability, cost and a carbon perspective.

The scheme would also benefit from purchasing products as a service. This would encourage the reuse of existing components and reduce the B1-B5 emissions. Where possible materials should be sourced locally, to reduce transport emissions.



---

## 2.0 Introduction

### 2.1 Background

Devonshire (CIS Tower) Ltd, hereinafter referred to as “Devonshire Ltd”, have commissioned Tuffin Ferraby Taylor (TFT) Ltd., hereinafter referred to as “TFT” to undertake a Whole Life-Cycle Carbon Assessment (WLCA) of CIS Tower.

Prior to the commencement of the works, Devonshire Ltd wanted to understand the embodied and whole life carbon performance of the proposed design and reduce the embodied carbon impact. To address this, a WLC assessment is being undertaken by TFT. It should also be noted that an investigation into different façade options took place which was key to understanding the embodied carbon implications of the different design iterations. Full details can be found in the façade matrix. As part of the study the scheme targeted 70% recycled content in the aluminium used for the curtain walling. This report summarises the findings of the WLC assessment for RIBA Stage 2.

A Life Cycle Assessment (LCA), which is the method for analysing Whole Life Cycle impacts, can report several environmental indicators including but not limited to:

- Global Warming Potential (GWP)
- Acidification Potential (AP)
- Eutrophication Potential (EP)
- Ozone Depletion Potential (ODP)
- Life Cycle Costs (LCC)

For the purposes of establishing a whole life carbon baseline and for aligning against carbon intensity benchmarks, this report focuses on the GWP environmental indicator.

The report is for the benefit of the client only; Tuffin Ferraby Taylor (TFT) Ltd cannot accept any liability to any third party for the whole or any part of its contents. Our appointment specifically excludes the provisions set out in the contracts (Rights of Third Parties) Act 1999.

TFT is a trading name of Tuffin Ferraby Taylor (TFT) Ltd, a limited company registered in England and Wales. Registration number: 14869285. Registered office: 18 Holborn, London EC1N 2LE.

## 2.2 Proposed development

The proposal is for the redevelopment of CIS Tower; the existing and proposed views from Dantzic Street can be seen below.



**Figure 2:** Existing Site



**Figure 3:** Proposed Scheme

## 2.3 Scope of the assessment

TFT has undertaken a WLC assessment to determine the impacts of construction materials across the whole lifecycle of the proposed development. The assessment was commissioned based on the embodied carbon specifications and the specifications for the building fabric (façade option 11), MEP and renewable systems. Costs and paybacks are excluded from the scope of this work.

## 2.4 Embodied carbon targets

There is currently limited information available in relation to the WLC benchmarks, particularly for office buildings. It should be noted that Royal Institute of British Architects (RIBA) are based on whole life cycle stages A-C (excluding operational carbon) whilst LETI and UKNZCBS benchmarks include cradle to practical completion stages A1-A5. The benchmarks are summarised below. The figures in the below table include the timber sequestration unless else specified.

**Table 2:** Comparison of industry benchmarks for embodied carbon over time

| Embodied carbon benchmarks (kgCO <sub>2</sub> e/m <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |             |             |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|-------------|-------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | "Business as usual" | 2020 Target | 2025 Target | 2030 Target |
| UKNZCBS Upfront Embodied Carbon Target Alignment – Offices Retrofit <sup>5</sup> (A1-A5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -                   | -           | 600         | 450         |
| RIBA 2030 Climate Challenge <sup>1</sup> – Offices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,400               | -           | <970        | <750        |
| LETI Upfront Embodied Carbon Primer – Office best practice targets <sup>2</sup> (A1-A5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1,000 (excl. seq.)  | <500        | -           | <250        |
| LETI Upfront Embodied Carbon Target Alignment – Office <sup>3</sup> (A1-A5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                   | <600        | -           | <350        |
| LETI Life Cycle Embodied Carbon Target Alignment – Office <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -                   | <970        | -           | <530        |
| <sup>1</sup> <a href="https://www.architecture.com/-/media/files/Climate-action/RIBA-2030-Climate-Challenge.pdf">https://www.architecture.com/-/media/files/Climate-action/RIBA-2030-Climate-Challenge.pdf</a><br><sup>2</sup> <a href="https://www.leti.uk/_files/ugd/252d09_8ceffcbcafdb43cf8a19ab9af5073b92.pdf">https://www.leti.uk/_files/ugd/252d09_8ceffcbcafdb43cf8a19ab9af5073b92.pdf</a><br><sup>3</sup> <a href="https://www.leti.uk/_files/ugd/252d09_25fc266f7fe44a24b55cce95a92a3878.pdf">https://www.leti.uk/_files/ugd/252d09_25fc266f7fe44a24b55cce95a92a3878.pdf</a><br><sup>4</sup> <a href="https://www.london.gov.uk/sites/default/files/lpg_-_wlca_guidance.pdf">https://www.london.gov.uk/sites/default/files/lpg_-_wlca_guidance.pdf</a><br><sup>5</sup> <a href="https://www.nzcbuildings.co.uk/_files/ugd/6ea7ba_55a9d021ca274eda8fbf7b07c70e70cb.pdf">https://www.nzcbuildings.co.uk/_files/ugd/6ea7ba_55a9d021ca274eda8fbf7b07c70e70cb.pdf</a> |                     |             |             |             |



## 3.0 Methodology

### 3.1 Life Cycle Assessment

Whole Life Carbon is the measure of the total carbon emissions of a building over its entire life cycle, as defined by EN 15978, from the material product stage (A1-A3), associated transportation (A4) and construction impacts (A5), through building operation (B1-B7), and end of life (C1-C4). Whole life carbon is generally split into embodied and operational carbon. Below are details of the different reporting mechanisms aligned with EN 15978 to monitor embodied carbon emissions through a building's lifecycle.

| Whole Life Carbon Assessment Information |                                  |                             |                            |                                     |                    |             |        |             |               |                        |                       |                             |                                |                                                   |                                                      |                                               |
|------------------------------------------|----------------------------------|-----------------------------|----------------------------|-------------------------------------|--------------------|-------------|--------|-------------|---------------|------------------------|-----------------------|-----------------------------|--------------------------------|---------------------------------------------------|------------------------------------------------------|-----------------------------------------------|
| Project life cycle information           |                                  |                             |                            |                                     |                    |             |        |             |               |                        |                       |                             |                                |                                                   | Supplementary info.<br>beyond the project life cycle |                                               |
| [A1-A3]                                  |                                  |                             | [A4-A5]                    |                                     | [B1-B7]            |             |        |             |               |                        |                       | [C1-C4]                     |                                |                                                   |                                                      | [D]                                           |
| Product stage                            |                                  |                             | Construction process stage |                                     | Use stage Embodied |             |        |             |               | Use stage Operational  |                       | End of life stage           |                                |                                                   |                                                      | Benefits and loads beyond the system boundary |
| A1                                       | A2                               | A3                          | A4                         | A5                                  | B1                 | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                          | C2                             | C3                                                | C4                                                   | D                                             |
| Raw material extraction & supply         | Transport to manufacturing plant | Manufacturing & fabrication | Transport to project site  | Construction & installation process | Use                | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction / Demolition | Transport to disposal facility | Waste processing for reuse, recovery or recycling | Disposal                                             | Reuse, Recovery, Recycling potential          |
|                                          |                                  |                             |                            |                                     |                    |             |        |             |               |                        |                       |                             |                                |                                                   |                                                      |                                               |

**Figure 4:** EN15978 Life Cycle Assessment typical system boundaries – Source: RICS<sup>1</sup>

<sup>1</sup> RICS. Whole life carbon assessment for the built environment (September 2023)

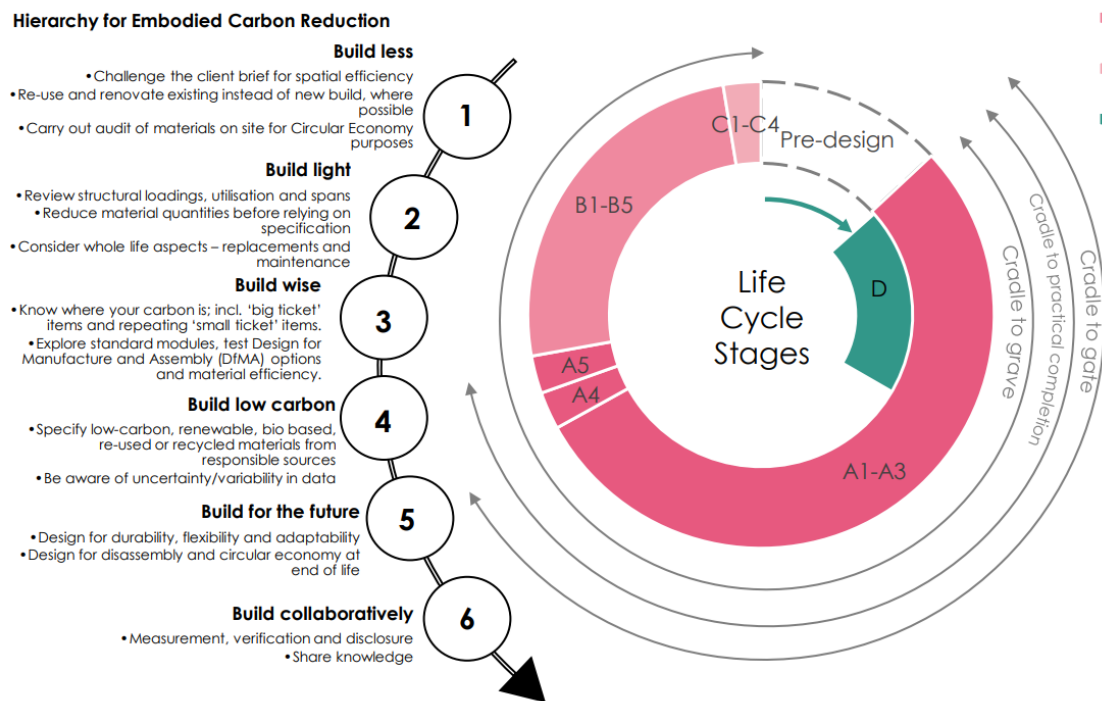


**Figure 5:** LETI Hierarchy for Embodied Carbon Reduction, according to BS EN 15978:2011

## 3.2 Scope of Assessment

A whole life carbon assessment should consider all building components and works relating to the project, including any external works within the site boundary. The professional statement on undertaking Whole Life Carbon assessments (September 2023) defines the building elements which must be included in a complete whole life carbon assessment. Table 3 outlines the building parts, based on the ICMS 3 breakdown, that should be covered in the whole life assessment, as applicable to each project.

**Table 3:** Building element groups (based on the BCIS breakdown)

|    | Building part/ Element group                                 |
|----|--------------------------------------------------------------|
| 01 | Demolition                                                   |
| 02 | Substructure                                                 |
| 03 | Structure                                                    |
| 04 | Non- structural works                                        |
| 05 | Services and equipment                                       |
| 06 | Surface and underground drainage                             |
| 07 | External and ancillary works                                 |
| 08 | Preliminaries/ constructors' site overheads/ temporary works |
| 12 | Production and loose furniture, fittings and equipment       |

### 3.3 Proprietary Software

The tool TFT used to undertake the LCA is One Click LCA which has an extensive material database (circa 10,000) allowing for a more reflective carbon model to be produced, in reference to the design specifications. In comparison the BRE's IMPACT dataset currently only contains approximately circa 350 products as well as being limited to UK-specific datasets, compared to the OneClick which has material information across continents (predominantly Europe, North America, Australia and Asia).



One Click LCA is an online Building Life-Cycle Assessment software. It is an industry-leading platform that is used by many construction industry firms.

One Click LCA is compliant with BREEAM UK NC 2018 and can achieve up to 10 Mat 01 credits; it has the highest rated LCA software for BREEAM, with a verified maximal Mat 01 score of 100% for BREEAM UK RFO 2014. The tool is also third-party verified for EN 15978, ISO 21931-1, ISO 21929-1 and for input data for ISO 14040/44 and EN 15804 standards.

### 3.4 Approach

A cradle-to-grave system boundary LCA was undertaken using One Click, which included the following modules:

- A1-A5 (Cradle to practical completion)
- B1-B5 (In Use)
- B6 & B7 (Operational carbon from energy and water use)
- C1-C4 (End of Life)

The approach presents the whole life embodied carbon performance of materials and operations and aligns with the Royal Institution of Chartered Surveyors (RICS) methodology in accordance with the professional standard on undertaking Whole Life Carbon assessments (September 2023). Table 1 confirms the approach to the WLC for the asset.

**Table 4:** WLC modelling parameters.

| Study Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The assessment design life assumes 60 years in accordance with RICS methodology.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Material Service Life                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Unless confirmed via the project team, component lifespans follow the expected lifespans presented in Table 9 of the RICS professional statement on undertaking whole life carbon assessments. Where the component type is not presented in Table 9 of the RICS guidance, the default OneClickLCA value has been used, which aligns with the RICS methodology.                                                                                                                                                                                |
| Functional Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| To allow comparisons to be made with benchmarks and policy targets, the functional unit for WLC is shown in kgCO <sub>2</sub> e/m <sup>2</sup> for gross internal floor area (GIA). The GIA for the project (51,375 m <sup>2</sup> ) and has been extracted from the accommodation schedule cost plan provided by Simpson Haugh on the 17th of January 2025. This excludes the leisure function and retail areas. An accompanying WLC report for the leisure, function and retail areas will follow once details of the fit out are provided. |
| System Boundary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| The WLC assessment for the whole building includes embodied carbon cradle to grave (modules A1-A5, B1-B5 and C1-C4) and operational emissions (modules B6 and B7) reported separately.                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Materials Inputs</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>The Revit models provided by the design team on the 28<sup>th</sup> October 2024 have been used as the basis for the assessment. This has also been supplemented by the cost plan received from Gardiner &amp; Theobald LLP 6<sup>th</sup> of March 2025.</p> <p>Email clarifications on specifications and quantities from the Design Team including Architect (Simpson Haugh), Structural Engineer (Curtins) and Services Engineer (CWC) for information on specified materials, products, and quantities.</p> |
| <b>Operational Energy Consumption</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>The expected annual energy consumption was provided by the Services Engineer, CWC. An EUI of 64.93kWh/m<sup>2</sup> has been used for the offices.</p>                                                                                                                                                                                                                                                                                                                                                           |
| <b>Operational Water Consumption</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>TFT has estimated the water consumption data based on guidance on occupant density per floor area for the building type provided by BRE and standard water consumption per occupant provided by BSRIA. The predicted operational water consumption is 40,832.55m<sup>3</sup> assuming 2,846 occupants and that one occupant will use 45 l/d of water.</p>                                                                                                                                                        |
| <b>Material Wastage Rates</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>Waste factors for the materials have been taken from the default values provided within the OneClickLCA software. The wastage for prefabricated elements, such as the composite metal panels and the build-up roofs, has been assumed equal to zero.</p>                                                                                                                                                                                                                                                         |
| <b>Transportation to Site (Module A4)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>In line with Table 17 of the RICS professional statement on whole life carbon assessment, the default transport scenarios have been used in the calculation of the module A4 transportation emissions. Where the component type is not presented in Table 7 of the RICS guidance, the default OneClickLCA value has been used, which aligns with the RICS methodology.</p>                                                                                                                                       |
| <b>Maintenance and Repair (Modules B2 &amp; B3)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>The repair and maintenance emissions have been estimated using a default scenario from the OneClick LCA database.</p>                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Material Replacement (Module B4)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>Maintenance and servicing arrangements are not fully developed for the project; however, an allowance has been made for material and product replacement. These allowances are based on the default figures produced by the One Click LCA software.</p>                                                                                                                                                                                                                                                          |
| <b>Material End of Life Scenarios</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>Recycling content and recycle rates at end of life of the materials are as per RICS methodology default recommendations. For the materials where information was not available, the default values within the software tool have been used.</p>                                                                                                                                                                                                                                                                  |
| <b>Construction Site Scenarios</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>Average UK site impacts per m<sup>2</sup> of total project value have been used, based on data entry points in the One Click LCA software. The scenario includes associated fuel, electricity, waste generation and transportation impacts whilst on site.</p>                                                                                                                                                                                                                                                   |

## 3.5 Methodology

The Revit models provided were analysed and the information from these models was inputted into the OneClickLCA model. This was supplemented by the cost plan received from Gardiner and Theobald. Additionally, email clarifications from the Design Team were used to ensure that the modelled elements accurately represent what has been specified.

In accordance with the RICS methodology on whole life carbon assessments, a sufficient number of elements from the design information provided were modelled so that a minimum of 95 % of the cost allocated to each building element category defined in 0-8 of Table 3 are accounted for in the assessment. Items excluded from the model, each account for less than 1 % of the total category cost.

As this assessment has been completed in the early design phase all figures are reported to two significant figures as per the RICS methodology. A 15% contingency factor has been applied with a top up factor (7%) to account for the carbon data uncertainty factor.

Following the above, the remainder of the information such as energy consumption, water consumption and refrigerant details were included in the model using the methodology and sources defined in Table 1. This was then identified as the baseline model for the project. The model was analyzed, and carbon reduction opportunities identified.

## 3.6 Limitations of Study

In cases where exact product matches are not provided by the database, the following steps, recommended by OneClickLCA have been followed to ensure the most representative EPD for the specified product is used in the model:

- Option 1: Exact materials (search for the exact product from the manufacturer you are planning to choose).
- Option 2: Closest matches (if you cannot find the product from your manufacturer, try to search for other manufacturers typically used in your country).
- Option 3: Use generic data (if you cannot find a suitable product choose a generic one with similar qualities).

Furthermore, there are some items that do not exist in OneClick LCA's EPD library, or items for which provisional allowances have been attributed to the cost plan, but specifications have currently not been finalised. These items have been omitted from the scope of this assessment. In line with RICS guidance, it has been ensured that items excluded each account for less than 1 % of the total building element category cost.

The WLC assessment is an ongoing and iterative process that is refined and enhanced as project information becomes available through the design process. The data input into the WLC model will be added to, reviewed, and refined throughout the design process as designs become formalised and more specific materials/ systems/ component information becomes available.



## 4.0 Results

### 4.1 WLC Results

The following results summarise the WLC emissions for the proposed development. The whole life carbon assessment encompasses the full scope in line with the RICS professional statement and utilises the OneClick material component database. For the embodied carbon, the upfront carbon emissions (A1-A5, excluding sequestration) are equal to 27,000 tCO<sub>2</sub>e or 530 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). The life cycle embodied carbon emissions (A-C excluding B6-B7 operational carbon and including sequestration) are equal to 54,000 tCO<sub>2</sub>e or 1000 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA).

**Table 5:** CIS Tower Carbon Emissions Summary (60 Year Reference Study Period)

|                                                                           | tCO <sub>2</sub> e | kgCO <sub>2</sub> e/m <sup>2</sup> |
|---------------------------------------------------------------------------|--------------------|------------------------------------|
| Upfront Carbon (A1-A5) (excluding Sequestration)                          | 27,000             | 530                                |
| Life Cycle Embodied Carbon (A-C excluding B6-B7, including Sequestration) | 54,000             | 1,000                              |
| Operational Energy and Water Use (B6-B7)                                  | 13,000             | 260                                |
| B-C embodied carbon emissions (excluding B6-B7 and sequestration)         | 26,000             | 510                                |
| Whole Life Carbon (A-C including B6-B7)                                   | 67,000             | 1,300                              |

Figure 6 highlights the proportion of carbon emissions attributed to each life cycle stage. It includes emissions associated with the product stage (A1-A3), construction process stage (A4-A5), use stage (B1-B7) and end of life (C1-C4). The figure shows that the greatest contribution to the scheme's WLC emissions are the emissions associated with product stage (A1-A3) (39.77 %). Emissions attributed to the use stage (B1-B5) (35.49%) are the second largest contributor, followed by the regulated operational energy (B6a), which accounts for 21.57% of total WLC emissions.

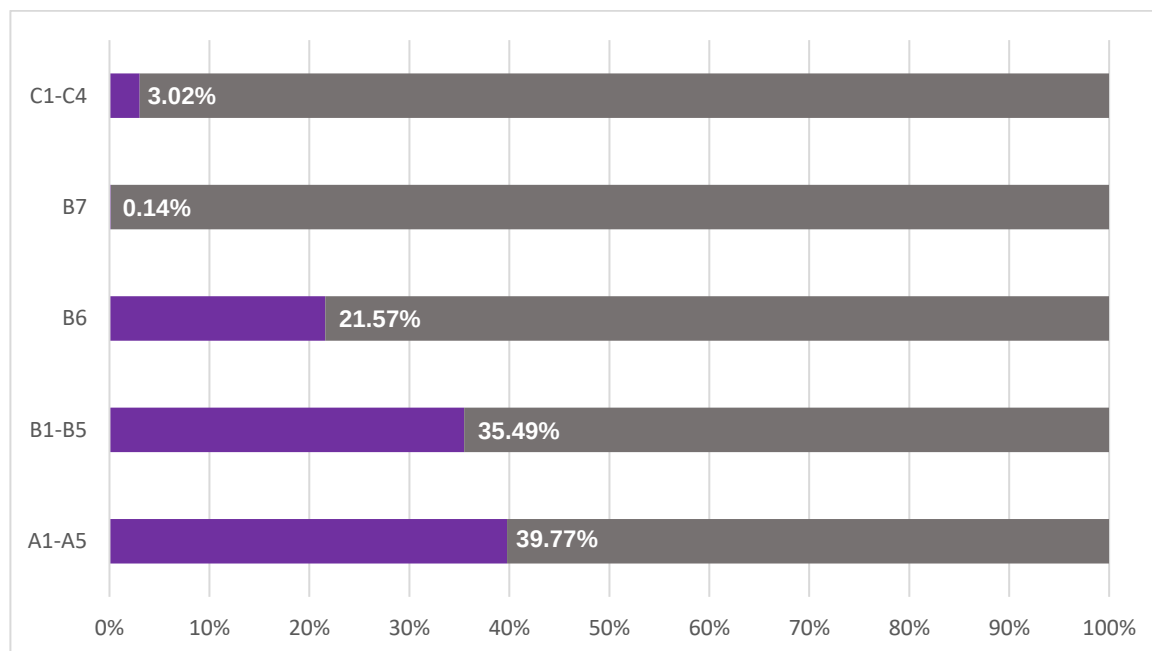


**Figure 6:** Breakdown of total carbon emissions by lifecycle stage

## 4.2 Embodied Carbon Emissions Breakdown (A1-A3)

Figure 7 shows the breakdown of the total carbon emissions by classification. It shows that the main sources of carbon emissions are from the curtain walling (41%), cables (14%) and HVAC (13%).

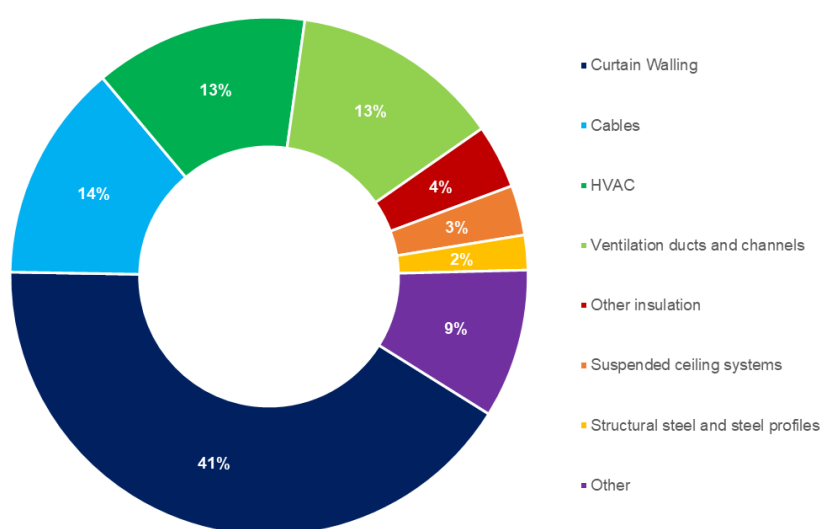


**Figure 7:** Embodied carbon breakdown of total emissions by resource type

### 4.3 Embodied Carbon Performance

The embodied carbon emissions have been extracted from the baseline model and reported in Tables 6 to 8 below against relevant industry and GLA benchmarks. The following guidance has been consulted in order to determine relevant industry benchmarks for the project:

- UKNZCBS Pilot Version (September 2024)
- London Energy Transformation Initiative (LETI) – Embodied Carbon Primer (2020)
- London Energy Transformation Initiative (LETI) – Embodied Carbon Target Alignment (2020)
- Royal Institute of British Architects (RIBA) – 2030 Climate Challenge (2021)

Shown in Table 6 below, the total upfront embodied carbon emissions from cradle to practical completion (modules A1-A5, excluding sequestration), based on the information provided at the design stage, are 27,000 tCO<sub>2</sub>e, equal to 530 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). The proposal is significantly below the UKNZCBS 2025 target (<600 kgCO<sub>2</sub>e/m<sup>2</sup>).

**Table 6:** Building performance against upfront embodied carbon A1-A5 (excluding sequestration) benchmarks

| Upfront Embodied Carbon A1-A5 (excluding sequestration) (kgCO <sub>2</sub> e/m <sup>2</sup> ) |           |           |
|-----------------------------------------------------------------------------------------------|-----------|-----------|
|                                                                                               | Benchmark | CIS Tower |
| LETI Upfront Embodied Carbon Primer – “Business as usual”                                     | < 1,000   | 530       |
| UKNZCBS 2025 Target for office retrofit                                                       | <600      |           |
| UKNZCBS 2026 Target for office retrofit                                                       | <575      |           |
| LETI Upfront Embodied Carbon Target Alignment – Office 2030 target                            | < 350     |           |
| LETI Upfront Embodied Carbon Primer – Office best practice 2030 target                        | < 250     |           |

Shown in Table 7 below, the life cycle embodied carbon emissions (A-C modules, excluding modules B6 & B7 and including sequestration), based on the information provided at the design stage, are 54,000 tCO<sub>2</sub>e, equal to 1000 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). The building meets RIBA’s 2030 Climate Challenge 2025 target (<1,400 kgCO<sub>2</sub>e/m<sup>2</sup>) for non-domestic (new build offices).

**Table 7:** Building performance against life cycle embodied carbon (A-C, excluding B6 & B7, including sequestration) benchmarks

| Life Cycle Embodied Carbon (A-C, excluding B6 & B7, including sequestration) (kgCO <sub>2</sub> e/m <sup>2</sup> ) |           |           |
|--------------------------------------------------------------------------------------------------------------------|-----------|-----------|
|                                                                                                                    | Benchmark | CIS Tower |
| RIBA 2030 Climate Challenge target metric non-domestic (new build offices) – “Business as usual”                   | < 1,400   | 1000      |



## 5.0 Carbon Reduction Opportunities

As stated, the majority of the existing structure is retained. A pre-demolition audit is to be carried out and the findings of which will inform potential areas for reuse. The key works taking place are:

- New podium extension
- Façade replacement
- Inclusion of new MEP systems

A material breakdown highlighting elements with the highest associated carbon impact from within the baseline model has been identified. The top 10 material contributors of upfront embodied carbon (modules A1-A3) are presented in Table 8.

**Table 8:** Most contributing materials to product stage (A1-A3) embodied carbon emissions

| Building component               | Contribution (%) of cradle to gate (A1-A3) | Cradle to gate (A1-A3) impacts (tCO <sub>2</sub> e) |
|----------------------------------|--------------------------------------------|-----------------------------------------------------|
| Curtain walling                  | 40%                                        | 7300                                                |
| Steel ducting                    | 13%                                        | 2300                                                |
| Low voltage cabling              | 9%                                         | 1600                                                |
| Heating system                   | 7%                                         | 1300                                                |
| Pipework                         | 6%                                         | 1000                                                |
| Medium voltage cabling           | 5%                                         | 820                                                 |
| Insulation for MEP installations | 4%                                         | 670                                                 |
| Ceiling finish                   | 3%                                         | 570                                                 |
| Steel sections                   | 1%                                         | 250                                                 |
| Flooring finish                  | 1%                                         | 220                                                 |

As identified from the above table of significant contributors, the greatest potential to make meaningful reductions in the building's carbon emissions lies with the curtain walling and MEP systems. The scheme already benefits from aluminium with 70% recycled content within the curtain walling so there lies little scope for improvement. The model used OneClick generic profiles for the MEP systems. In the technical design stage, when MEP data is more readily available steps should be taken to ensure that the best materials are chosen in terms of durability, cost and a carbon perspective.

Materials should also be sourced locally, if possible, to reduce transport emissions. To further reduce B1-B5 emissions the scheme would benefit from purchasing products as a service. This would encourage the reuse of existing components. Further information can be found in the circular economy statement.



---

## 6.0 Conclusion

TFT undertook a Whole Life-Cycle Carbon Assessment (WLCA) of CIS Tower to understand the embodied and whole life carbon performance of the proposed design and to suggest improvements for the reduction of the embodied carbon impact.

The total upfront embodied carbon emissions (modules A1-A5, excluding sequestration) are 27,000 tCO<sub>2</sub>e, equal to 530 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). The building meets the UKNZCBS 2026 target for office retrofits (<575 kgCO<sub>2</sub>e/m<sup>2</sup>).

The life cycle embodied carbon emissions (A-C modules, excluding modules B6 & B7 and including sequestration), based on the information provided at the design stage, are 54,000 tCO<sub>2</sub>e, equal to 1,000 kgCO<sub>2</sub>e/m<sup>2</sup> (GIA). The building meets RIBA's 2030 Climate Challenge "Business as usual" target (<1,400 kgCO<sub>2</sub>e/m<sup>2</sup>) for non-domestic (new build offices).

### 6.1 Recommendations

Section 5 of this report summarizes the embodied carbon reduction opportunities for further investigation. In the technical design the selection of MEP components is a key consideration in terms of durability, cost and a carbon perspective.

Where possible materials should be sourced locally, if possible, to reduce transport emissions. The scheme would also benefit from purchasing products as a service. This would further encourage the reuse of existing components and reduce the B1-B5 emissions.

### 6.2 Limitations of this study

The study was completed using the best information available at the time of analysis. However, there were limitations with the scope of the data sources available. Please refer to Section 3.6 for further details.

# Core services

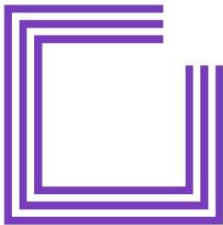
Development  
Built Assets  
Sustainability



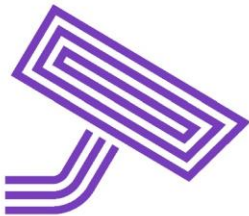
Technical Due Diligence



Project Management



Dilapidations



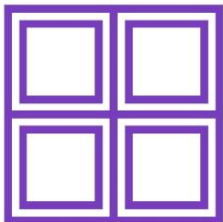
Project Monitoring



Cost Consultancy



M&E Consultancy



Rights of Light



Lender Monitoring



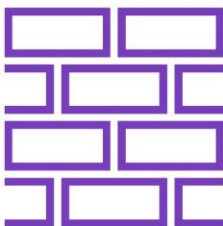
CDM Consultancy



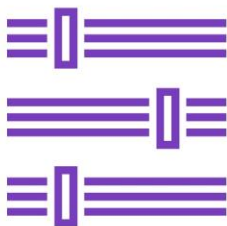
Geomatics



Life Cycle Assessments



Party Walls



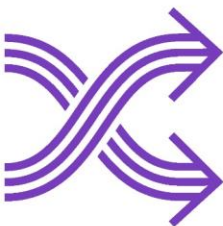
Performance Optimisation



Asset Certification



Wellbeing



Sustainability Coordination



**We place the wellbeing of people  
and the performance of buildings  
at the heart of everything we do**

[www.tftconsultants.com](http://www.tftconsultants.com)