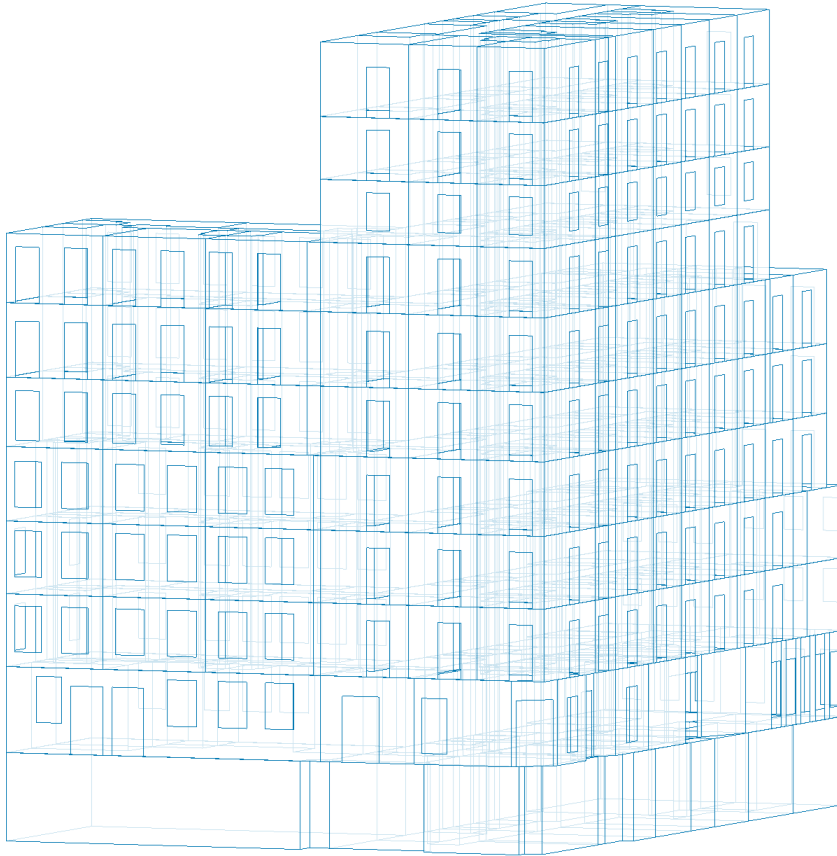


Caldwell



B0989 Oldham Street Aparthotel

Embodied Carbon Statement

Version: V1.0

Current Version Publish Date: 24/11/2022

Building Performance Prediction Ltd.
Caldwell Group
Unit 6 Forestgrove Business Park
Belfast
BT8 6AW
028 9069 9720



Contents

1	Executive summary	3
1.1	Summary of the approach, key commitments, and targets.....	4
2	Introduction.....	5
2.1	Brief Description of the development.....	5
2.2	Development areas:	5
3	Approach.....	6
3.1	Data Sources	6
3.2	Methodology.....	6
3.3	Circular economy aspirations.....	6
4	Circular Economy Commentary	7
4.1	Strategic approach(es)	7
4.1.1	Circular economy approach for the existing site	7
4.1.2	Circular economy approach for municipal waste during operation	7
4.2	Explaining the strategic approach(es)	7
4.3	Circular Economy	7
4.3.1	Minimise the quantities of materials used	7
4.3.2	Minimise the quantities of other resources used (energy, water, land)	8
4.3.3	Specify and sourcing materials and other resources responsibly and sustainably.....	8
4.3.4	Design for longevity, adaptability or flexibility and reusability or recoverability	8
4.3.5	Design out construction, demolition, excavation and municipal waste arising	8
4.3.6	Manage demolition waste	8
4.3.7	Manage excavation waste	8
4.3.8	Manage construction waste	8
4.3.9	Manage municipal waste	8
5	Whole Life Carbon Analysis.....	9
6	Conclusion.....	11
7	Appendices.....	12
7.1	LETI 2030 Calculator tool Output	12
7.2	LCA Building Full Results	13



Figure 1 Whole life embodied carbon by life cycle stage	3
Figure 2 Site Location and plan.....	5
Figure 3 Whole Life Embodied Carbon	9
Figure 4 Whole Life Embodied carbon comparison.....	9
Figure 5 Total KgCO2e by RICS Category	10
Figure 6 Total KgCO2e by Resource Type	11
Table 1 Embodied carbon By Life Cycle Stage	4
Table 2 Data Sources Summary	6

Version	Date	Reason for issue	Prepared By	Checked By
1.0	Nov-22	Planning	MC/AG	AG

Building Performance Prediction Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and Building Performance Prediction Ltd. accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

©BPP Ltd 2022



1 Executive summary

This embodied carbon statement has been prepared in support of the planning application for the development of land bound on Oldham Street, Manchester and in response to a request for further information (email from Angela Leckie to Rebecca Boston on the 17/11/2022 titled 'Re: App ref no 134953/FO//2022 – 68-70 Oldham Street) specifically requesting the below.

Embodied Carbon / Circular Economy - Can we have a statement on the approach being taken in the design and construction of the development with respect to this and any particular benchmarking standards such as RIBA 2030 that are to be applied across the project. I am looking for specific details rather than a generic commitment such as the statement in Section 6.6 of the Energy and Sustainability Statement

The application site is located within the administrative boundary of Manchester City Council.

This document follows on from the previously submitted Sustainability statement for the development and summarises the calculation of embodied carbon for the proposed development.

Analysis using the One Click LCA online software has been undertaken to calculate the Embodied carbon using the RIBA target of <800kgCO₂e/m² however the aspiration for the development is to achieve the RIBA 2030 Challenge target of <625kgCO₂e/m².

This report outlines the Whole Life Carbon Assessment which has been undertaken.

This document is split into a life cycle assessment and a circular economy commentary which overall shows the benefits of reusing the existing façade and some of the structure to reduce carbon and benefit towards a circular economy.

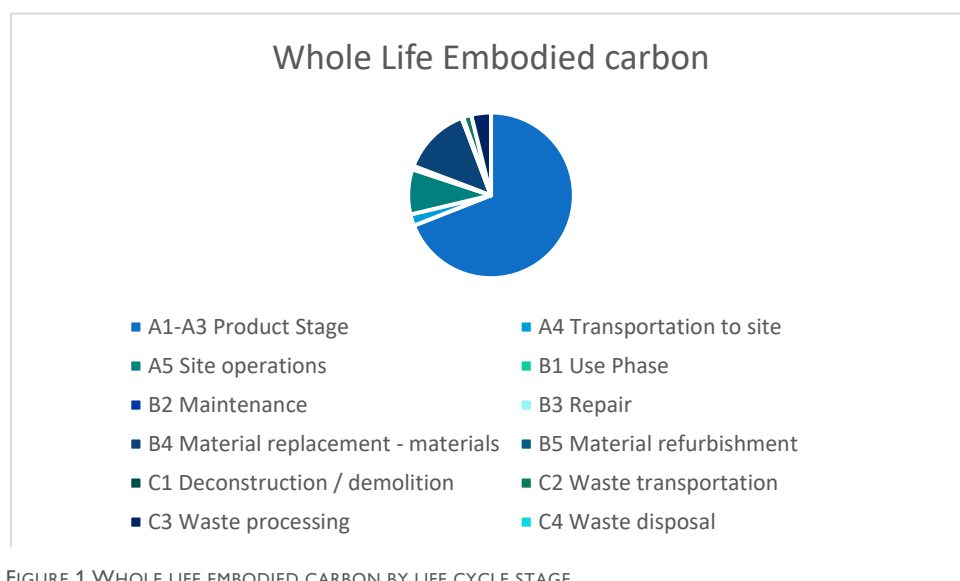


FIGURE 1 WHOLE LIFE EMBODIED CARBON BY LIFE CYCLE STAGE



1.1 *Summary of the approach, key commitments, and targets*

The design team's strategic approach for the proposed development is longevity and adaptability.

To achieve their objectives the design team is committed to monitor their waste arising from demolition, excavation and construction and promote reuse on site where possible. Construction materials used will prioritise those with a higher recycling rate. The warehouse and the façade on 68 & 70 Spear St are being retained. With the rest of the building being newly built. As can be seen in Figure 1 below the retaining of these building elements reduces the equivalent carbon emissions.

Based on the analysis completed to date the working values are a total kgCO₂e/m² of 682.4795, which is just above the RIBA 2030 challenge target of 625KgCO₂e/m².

However, we have allowed for a miscellaneous addition of 200kgCO₂/m². This allowance will be taken up during design development with further items such as building services and other fittings would likely increase this embodied carbon figure. Our aspiration is still to achieve the RIBA 2030 target of 625kgCO₂e/m².

Table 1 below outlines the embodied carbon for each stage outlined below. Rows in Grey aren't included in RIBA 2030 targets.

TABLE 1 EMBODIED CARBON BY LIFE CYCLE STAGE

Life Cycle Stage	TOTAL kg CO ₂ e
Biogenic carbon (kg CO ₂ e)	-101888.58
A1-A3 Product Stage	2182764.63
A4 Transportation to site	70964.06
A5 Site operations	278391.32
B1 Use Phase	21952.18
B2 Maintenance	
B3 Repair	0
B4 Material replacement - materials	425771.39
B5 Material refurbishment	0
B6 Operational Energy use - Regulated	3793.6
B6 Operational Energy use - Unregulated	
B7 Operational Water use	266112.79
C1 Deconstruction / demolition	8962.06
C2 Waste transportation	51179.52
C3 Waste processing	121654.72
C4 Waste disposal	159.7
TOTAL kg CO ₂ e	3329817.4
D External impacts (not included in totals)	-1252623.79
KgCO ₂ e/m ²	682.4795



2 Introduction.

2.1 Brief Description of the development

The development is described as:

'Partial demolition of existing buildings, conversion of existing warehouse building, rooftop extension and new building of 10 storeys to create aparthotel and flexible commercial uses (Use Class E)'

2.2 Development areas:

- 117 bedrooms
- Gym & 2 commercial spaces on ground floor
- NIA: 3073
- GIA 4879.1

The application site location is highlighted below.

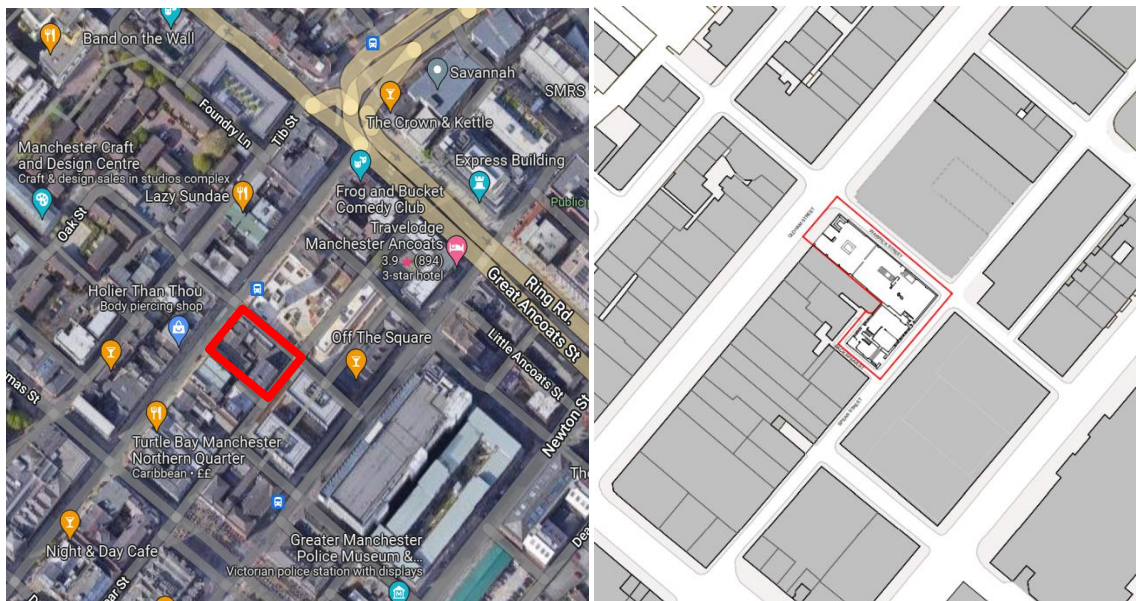


FIGURE 2 SITE LOCATION AND PLAN



3 Approach

3.1 Data Sources

Using the One Click LCA tool, a model has been created which relies on the following data sources for building information.

TABLE 2 DATA SOURCES SUMMARY

DATA TYPE	DATA SOURCE
Material quantities (A1-A3)	Planning drawings, planned quantities, Revit and SBEM models as delivered by the client and the designers acting on the client's behalf
Material transport distances (A4)	Regionally applicable transportation scenarios from One Click LCA. Those represent regionally typical transportation distances and methods for product types, which are relevant when no decisions on suppliers are made.
Construction and installation (A5)	Impacts are based on conservative default values from One Click LCA.
Material impacts in use (B1-B5)	Material service lives are based on the typical values for the materials in question.
End of life impacts (C1-C4)	End of life impacts are based on One Click LCA's scenarios which represent the typical end of life processing for material types in compliance with the requirements of the EN 15804+A1

3.2 Methodology

Workshops have been held with the design team to confirm material quantities and set embodied carbon targets for the development, as well as raise awareness of the circular economy.

Meetings/workshop	Attendance	Action
3 rd August	Design Team	Discussed embodied carbon options for BREEAM
18 th November	Design Team	Discussed General terms

The building elements included have been chosen based on RICS guidance on whole life carbon assessments.

3.3 Circular economy aspirations

The design team has engaged with the circular economy principles. The development had already an environmental management plan therefore attention was already made on recycling/reusing materials.



4 Circular Economy Commentary

4.1 Strategic approach(es)

The following sections provide a summary of the strategic approach:

4.1.1 Circular economy approach for the existing site

PHASE/ BUILDING/ AREA	Partial remodelling of areas no major demolition.
STEERING APPROACH	Maximise reuse of the existing building
EXPLANATION	Waste classification of demolition works and construction works
TARGET	95% diversion from landfill
SUPPORTING ANALYSIS	Pre-Demolition report / Site Waste Management Plan

4.1.2 Circular economy approach for municipal waste during operation

PHASE/ BUILDING/ AREA	In use phase
STEERING APPROACH	Reusability
EXPLANATION	Segregation of operational waste
TARGET	90% diversion from landfill
SUPPORTING ANALYSIS	Operational waste management

4.2 Explaining the strategic approach(es)

An early workshop has been carried out with the design team identifying the strategic approach is 'Longevity' and 'Durability' depending on the areas of the development.

The design should meet the long-term needs while being durable and resilient or able to cope with change with little modification, readiness for alternative technologies, different ways of living/working and a changing climate.

The design is considering the needs of the present but with consideration of how those needs might change in the future and designed for change in the forms of periodic remodelling including alterations or replacement on non-structural parts.

4.3 Circular Economy

The team has reached an agreement that the following targets and commitments shall be reported against at the full application stage. The following sections outline the potential targets and commitments based on the nine principles:

4.3.1 Minimise the quantities of materials used

A Pre-demolition report will be carried out before any demolition is taking place on the site to maximise the reuse or recycling of the materials. Maximize use of existing building



4.3.2 *Minimise the quantities of other resources used (energy, water, land)*

The site is located on a brownfield land and not using virgin land for the development. The reuse of the structure will lower demand on energy and water from construction. The energy statement introduces elements low thermal envelope and Heat Pump technology to minimise operational energy.

4.3.3 *Specify and sourcing materials and other resources responsibly and sustainably*

The development is using the Sustainable Procurement Plan principles to ensure best practice in relation to procurement and resourcing procedures.

4.3.4 *Design for longevity, adaptability or flexibility and reusability or recoverability*

The refurbishment will extend the life and further small modifications could be made in the future to revert to other similar applications such as care homes or other accommodation types.

4.3.5 *Design out construction, demolition, excavation and municipal waste arising*

The Construction Environmental Waste Management will include the hierarchy of material disposal and shall be monitored on the Smartwaste portal or similar.

4.3.6 *Manage demolition waste*

The Pre-demolition report shall include a demolition strategy and segregation of the materials to maximise reuse or recycling of the materials and divert them from landfill. This report is also used for Wst 01 credit for BREEAM assessment. The predicted and actual demolition waste shall be reported in the Site Waste Management Plan.

4.3.7 *Manage excavation waste*

Excavation waste is not anticipated for this project due to the extensive reuse of the building.

4.3.8 *Manage construction waste*

The construction waste shall be segregated and monitored on Smartwaste portal or similar and the predicted and actual waste shall be reported in the Site Waste Management Plan. This is part of the BREEAM assessment Wst 01 credit. Functional Adaptability studies shall be completed for construction waste occurred during operational phase due to maintenance, refurbishment and at the end of life.

4.3.9 *Manage municipal waste*

The development shall provide area for recycling waste and recycling bins within the occupied area to enhance recycling rates. Operational Waste Management Plan shall be developed.



5 Whole Life Carbon Analysis

A whole life Cycle Analysis Assessment has been carried out using One Click LCA software which follows the BS EN 15978 and RICS PS scope.

Figure 2 below highlights the Total KgCO₂e for the development across each life cycle stage.

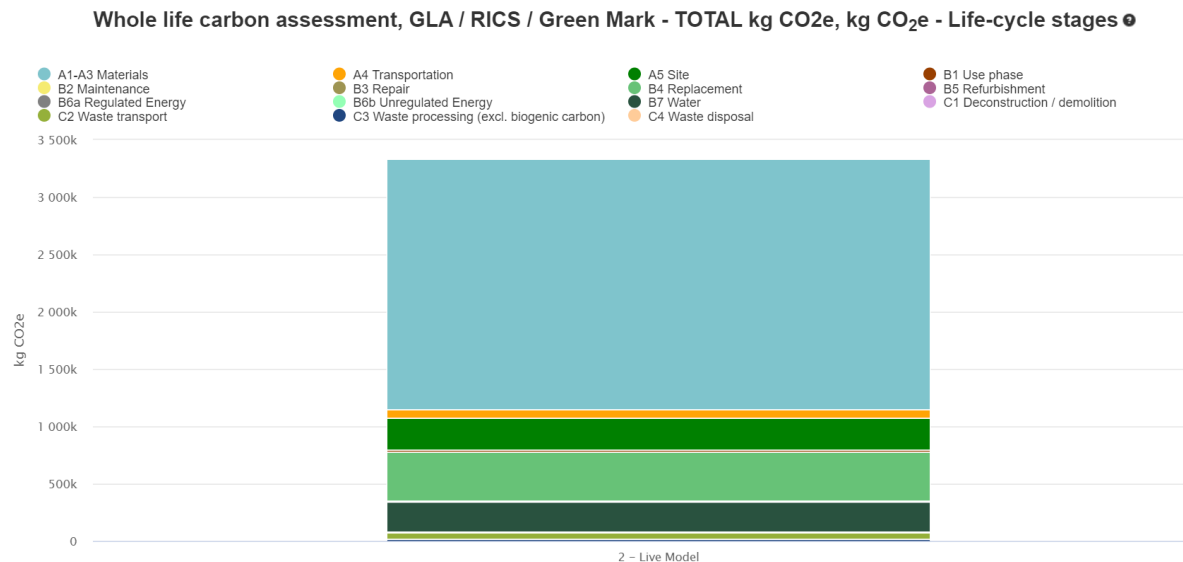


FIGURE 3 WHOLE LIFE EMBODIED CARBON

Figure 3 below is a comparison for the proposed development against if it was to be a new build without any retention of existing elements. The retention results in a large decrease in the overall KgCO₂e for the development.

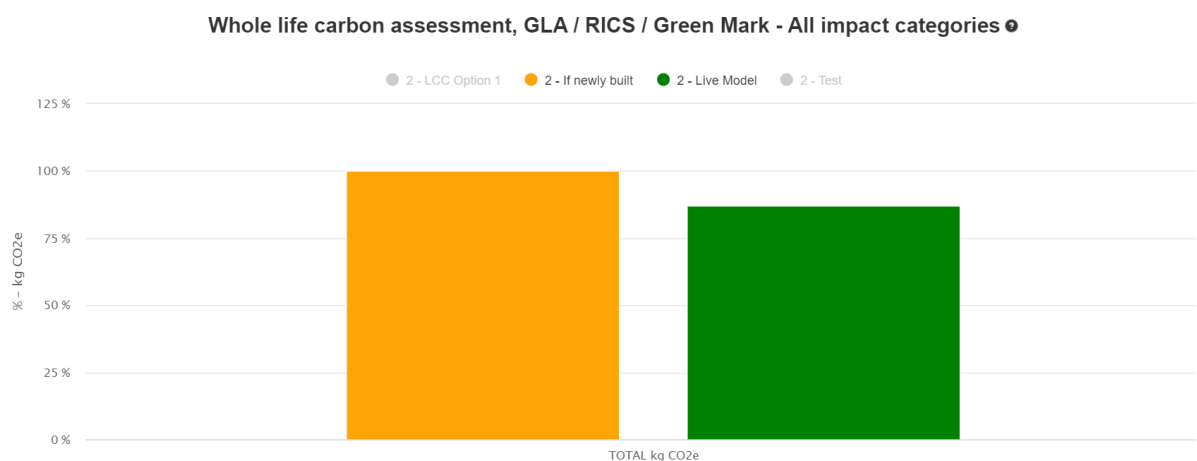


FIGURE 4 WHOLE LIFE EMBODIED CARBON COMPARISON



Figure 5 shows the total kgCO₂e predicted and is split by RICS category, some of these material categories such as groundworks will be developed through the design and construction phases as the material sources become more defined.

As can be seen the dominating factor is building services as these currently produce the highest amount of embodied carbon.

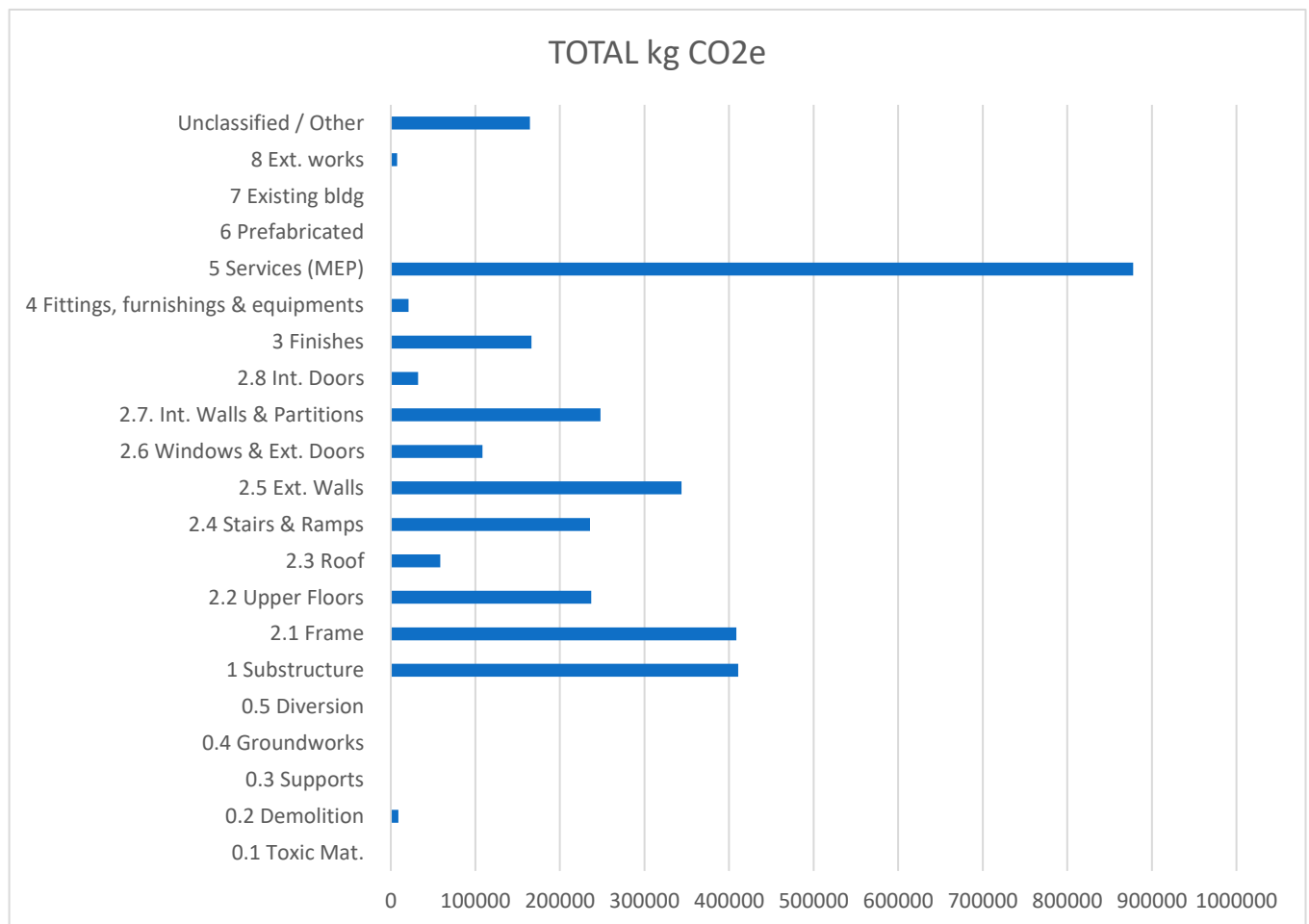


FIGURE 5 TOTAL KgCO₂e BY RICS CATEGORY



6 Conclusion

This LCA exercise has been beneficial to get an early gauge of the predicted embodied carbon of the development. As the design develops the current score is likely to increase however through this exercise and by exploring material use that has a low embodied carbon, we will be able to reduce this and reach the RIBA 2030 targets.

The development will aspire to follow circular economy principles as through the retention of the Spear St Warehouse and the façade on 68-70 Oldham Street the embodied carbon of the development has been lowered. Through principles set out in BREEAM concerning waste and monitoring of material transport this will further assist in the overall impact of the development.

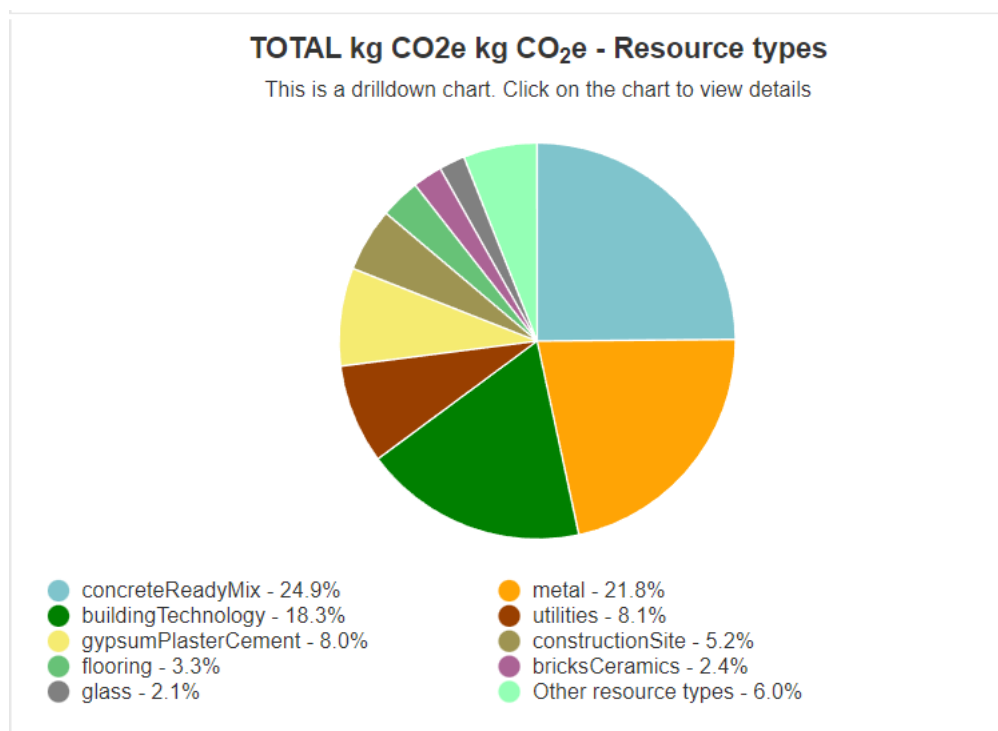


FIGURE 6 TOTAL KGCO₂E BY RESOURCE TYPE

The current scoring outlines that it is possible for the development to achieve the RIBA 2030 target of <625 kgCO₂e/m² however this will be explored further as the design needs to be developed further to include our allowances and explore options for selecting materials with a smaller embodied carbon. A contractor's supply chain will be crucial in the actual embodied carbon values and this is an unknown element at this stage. This should be manageable for the current target of <800kgCO₂e/m².



7 Appendices

7.1 LETI 2030 Calculator tool Output

Project Name Oldham St Aparthotel Project Sector Residential (6+ storeys) Assessment Date 24/11/2022 Assessment By (company) BPP Location of Data One Click	Upfront Embodied Carbon A1-5 exc. sequestration (kgCO ₂ e/m ²)	Life Cycle Embodied Carbon A1-5, B1-5, C1-4 (kgCO ₂ e/m ²)
A++	100	150
A+	200	300
A	300	450
B	400	625
C	500	800
D	675	1000
E	850	1200
F	1000	1400
G		
Non-Listed Typology:		
Sequestered Carbon:	0 kgCO ₂ e/m ²	
Module D:		0 kgCO ₂ e/m ²

v0.4.1 04/03/2022

The RIBA Targets are based on the LETI calculational method, and the chart above shows current levels being within the <800 kg CO₂e /m² target.



7.2 LCA Building Full Results

Whole life carbon assessment, Greater London Authority [Download Results Summary](#)

This is the project whole life carbon assessment according to RICS methodology, EN 15978 and Greater London Authority guidance for whole life-cycle carbon assessments. To see the detailed results report, please click [More actions > Detailed report](#).

	Biogenic carbon (kg CO2e)	A1-A3 Product Stage	A4 Transportation to site	A5 Site operations	B1 Use Phase	B2 Maintenance	B3 Repair	B4 Material replacement - materials	B5 Material refurbishment	B6 Operational Energy use - Regulated	B6 Operational Energy use - Unregulated	B7 Operational Water use	C1 Deconstruction / demolition	C2 Waste transportation	C3 Waste processing	C4 Waste disposal	TOTAL kg CO2e	D External impacts (not included in totals)
0.1 Toxic Mat.																		
0.2 Demolition													8 962				8 962	
0.3 Supports																		
0.4 Groundworks																		
0.5 Diversion																		
1 Substructure	0	363 226	19 806	16 779			0							10 085	1 030		410 927	-192 865
2.1 Frame	0	377 271	4 456	16 596			0							9 674	631		408 629	-459 758
2.2 Upper Floors	0	194 444	23 970	8 717			0							8 992	1 063		237 187	-69 919
2.3 Roof	0	39 047	2 088	2 349			0	12 989	0					793	1 363	11	58 641	-7 780
2.4 Stairs & Ramps	0	207 191	11 657	9 414			0							6 608	638		235 508	-48 419
2.5 Ext. Walls	0	311 801	7 167	17 971			0	544	0					5 714	525	81	343 803	-119 680
2.6 Windows & Ext. Doors	0	87 524	84	1 074			0	18 121	0					1 435	13	3	108 254	-9 183
2.7. Int. Walls & Partitions	0	214 202	581	27 564			0							5 551	179		248 077	-647
2.8 Int. Doors	-14 343	15 820	54	0			0	16 118	0					148	14 434	5	32 236	-7 793
3 Finishes	-48 691	51 177	202	8 153			0	92 936	0					167	62 438	6	166 389	-82 616
4 Fittings, furnishings & equipments	-38 744	17 557	122	3 021			0							94	39 059		21 110	-41 807
5 Services (MEP)	-111	300 095	576	2 168	21 952		0	281 304	0	3 794		266 113		1 782	267	53	877 994	-211 797
6 Prefabricated																		
7 Existing bidg																		
8 Ext. works	0	3 408	202	0			0	3 758	0					135	14		7 516	-361
Unclassified / Other				164 584													164 584	
TOTAL kg CO2e kg CO2e	-101 889	2 182 765	70 964	278 391	21 952		0	425 771	0	3 794		266 113	8 962	51 180	121 655	160	3 329 817	-1 252 624