Confidential

RIBA 3B Whole Life Carbon Assessment
Phoenix Academy Redevelopment

Planning Submission

Future Academies

R004TNR-240691-WLCA

20/03/2026

PICK EVERARD

Document History

Issue	Date	Comment	Author	Chk'd
P01	17/01/2025	RIBA 3A – Draft issue	JOS	KCR
P02	24/01/2025	RIBA 3A – Draft issue, draft landscaping information incorporated	JOS	JTB
P03	25/07/2025	RIBA 3B – For issue, review and comment	TNR	JHE
P04	05/08/2025	RIBA 3B – For issue, post comments and for review and further comments	TNR	TDD
P05	20/03/2026	RIBA 3B – For issue post GLA planning comments	TNR	JBK

This WLCA has been reviewed and checked by specialists within the Pick Everard Sustainability and Energy team.

Calculations completed for this report were performed using proprietary One Click LCA software. The software has been verified to be IMPACT equivalent by BRE and has been third party verified by ITB for compliancy with the following LCA standards: EN 15978, ISO 21931–1 and ISO 21929, and data requirements of ISO 14040 and EN 15804.

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Executive Summary

Future Academies has commissioned Pick Everard to undertake a Whole Life Carbon Assessment (WLCA) for the redevelopment of Phoenix Academy in Shepherds Bush, London ('the Proposed Development'). This WLCA supports the detailed planning application, which is referrable to the Greater London Authority (GLA). The redevelopment activities are targeted towards helping Future Academies deliver improved educational infrastructure, following the sale of the wider school site to a residential developer to secure funding.

This assessment describes the whole life carbon impact of the Proposed Development, comprising a new multi-storey teaching block and the wider site impacts associated with the proposed works. This report has been prepared at RIBA Stage 3B and utilises design information provided in July 2025.

Figure 1 shows the whole life carbon emissions for the multi-storey teaching block, taking into account the full suite of applicable life cycle modules and building elements. Across the education block assessment, certain materials and areas of the RIBA 3B design have been identified as contributing most significantly to the lifetime carbon impact of the design.

When compared to the most relevant industry benchmark for an education project (as proposed by the GLA), the Proposed Development's design achieves an Upfront Carbon (Modules A1-A5) value of **858 $kgCO_2e/m^2$ GIA** – this is higher (more impactful) than the GLA benchmark of **750 $kgCO_2e/m^2$ GIA**. In line with the referable nature of the Proposed Development, a number of commitments have been proposed to help reduce the Proposed Development's upfront carbon impacts.

Overall, the Proposed Development's WLC emissions are **5,974,294 $kgCO_2e$**, across a GIA of 4,393m^2; this generates a carbon intensity of **1,360 $kgCO_2e/m^2$ GIA**.

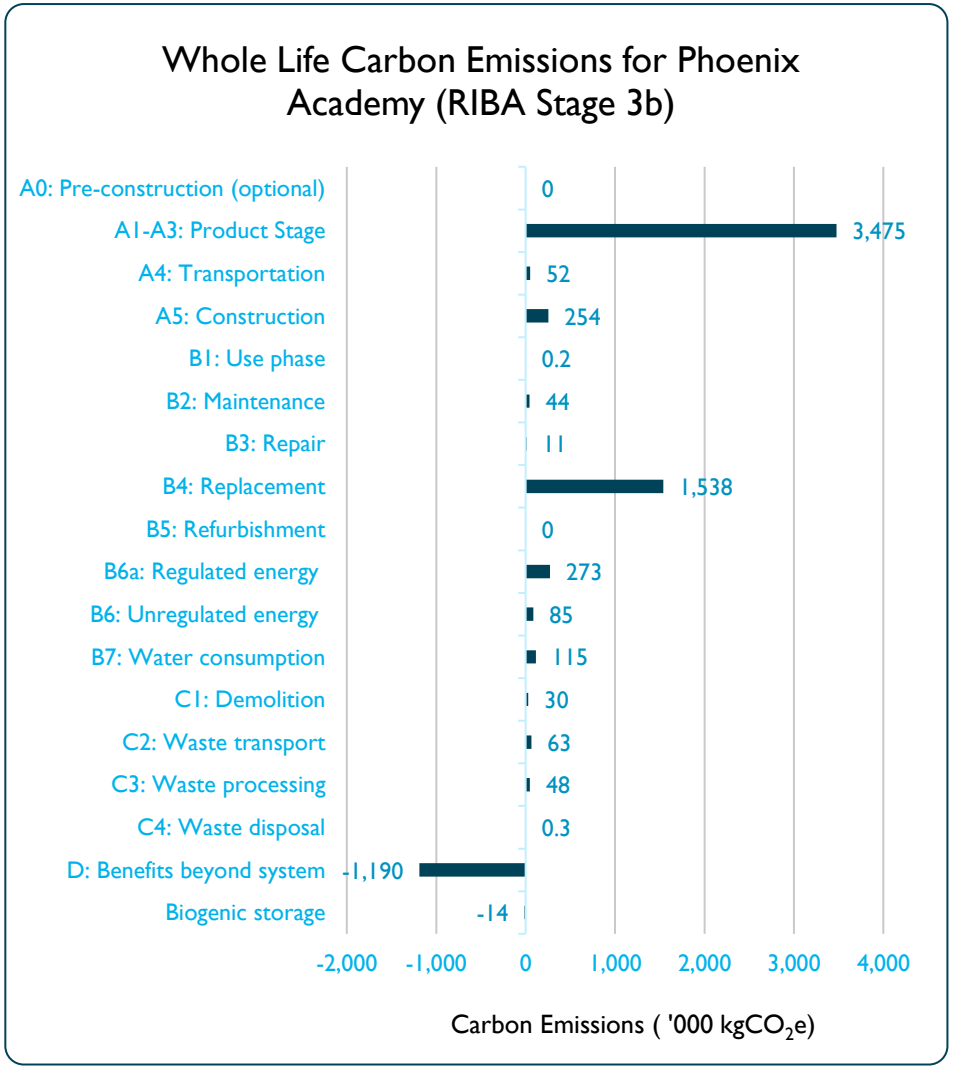

Figure 1: The Base Build's Whole Life Carbon Emissions

1.0 Introduction

1.1 Purpose of the report

Future Academies has appointed Pick Everard to conduct a Whole Life Carbon Assessment (WLCA) for the redevelopment of Phoenix Academy (herein 'the Proposed Development') at RIBA 3B to support a detailed planning application.

1.2 Site context

The Site of the Proposed Development is at the Phoenix Academy, The Curve, Shepherds Bush, London, W12 0RQ. The existing school site features several interconnected buildings, constructed between the 1950s and the 2010s to meet expanding needs.

Figure 2: The existing site plan, showing the boundaries for the residential boundary (blue) and the Proposed Development (red).

1.3 The proposed development

The Proposed Development is intended to accommodate students who are currently being taught in an old 1950s school building, which is to be demolished as part of the works. Along with the construction of a new school building, the Vibe Building and Technology Building are to be refurbished. The Proposed Development is to be funded by the sale of a part of the school land to a residential developer.

This assessment has been prepared for the RIBA Stage 3B redevelopment design of a school, in Shepherds Bush, London. The works to the Proposed Development comprise a new build multi-storey education block, funded by the Department of Education under the 2021 Construction Framework.

The Proposed Development will therefore require the demolition of the existing 1950's school buildings to clear the site for the new residential and educational buildings. The redevelopment includes a residential development by London Square, which has purchased the land west of the Proposed Development, as indicated by the blue boundary line, in **Figure 2**.

With a projected 60-year lifespan, the design for the Proposed Development prioritises durable, high-quality materials. This WLCA evaluates the carbon impact of these material choices, identifying carbon hotspots and appropriate mitigation measures to minimise the Proposed Development's lifetime impact.

Table 1 provides a functional breakdown of the area under assessment, as well as the formal GIA from which benchmarks, assumptions and impacts have been extrapolated. It should be noted that whilst the carbon impact of the designed landscape is *included* in this assessment, all refurbishment works have been excluded from this report (in accordance with the appointment and requirements for GLA referral).

Table 1: Functional building breakdown for the Proposed Development.

Building asset	RICS building classification	Design scale	GIA (m^2)
Multi-storey Teaching Block	Education (secondary)	New build	4,393
		Total	4,393

As the Proposed Development is considered a 'Major Development', it is referrable to the Greater London Authority. The whole life carbon (WLC) modelling and report have therefore been prepared in accordance with the best practice principles set out in: PAS 2080:2023[1], The London Plan (2021)[2], London Plan Guidance on Whole Life-Cycle Carbon Assessments (2022)[3], and the RICS Professional Statement on WLCAs 1st Edition (2017)[4].

The assessment covers the proposed new multi-storey teaching block and the wider site impacts associated with the proposed works. The refurbishment of the Vibe and Technology buildings have been excluded from this report.

Figure 3 illustrates the layout for the Proposed Development.

Figure 3: The proposed site layout for the Proposed Development.

[1] *PAS 2080:2023 Carbon Management in Buildings and Infrastructure guidance document – published by ICE – accessed June 2025.*
[2] *The London Plan – The Spatial Development Strategy for Greater London – accessed June 2025.*
[3] *London Plan Guidance on Whole Life-Cycle Carbon Assessments – A detailed methodology in line with the RICS Professional Statement on WLCAs 1st Edition - accessed June 2025.*
[4] *RICS Professional Statement on WLCAs 1st Edition – accessed June 2025.*

2.0 Methodology and inputs

As defined in the London Plan Guidance, WLC emissions are:

"The total carbon emissions resulting from construction and use, over a specific building's life span – this includes demolition and disposal."

For the purposes of this assessment, therefore, WLC emissions are those associated with the Proposed Development's:

- **embodied carbon** - emissions associated with raw material extraction, the manufacture and transport of building materials, and construction; also, the emissions associated with maintenance, repair, and replacement, as well as the potential savings from the reuse or recycling of components after the end of a building's useful life, in addition to any dismantling, demolition, and eventual material disposal; as well as its
- **operational carbon –** emissions arising from both regulated and unregulated energy consumed by an asset throughout its entire life cycle.

2.1 Study scope

2.1.1.1 Life cycle modules

Expected practice for conducting WLCAs requires that the assessment process be subdivided into four overarching modules: A, B, C and D. As per the guidance in BS EN 15978[5] and the RICS 1st Edition[6], the four overarching modules (and their further delineations), are shown **Figure 3**. Emissions associated with Module D (benefits beyond the system boundary) should be reported separately (due to the uncertainty in emissions associated with elements outside a building's life cycle) as described in the RICS 1st Edition.

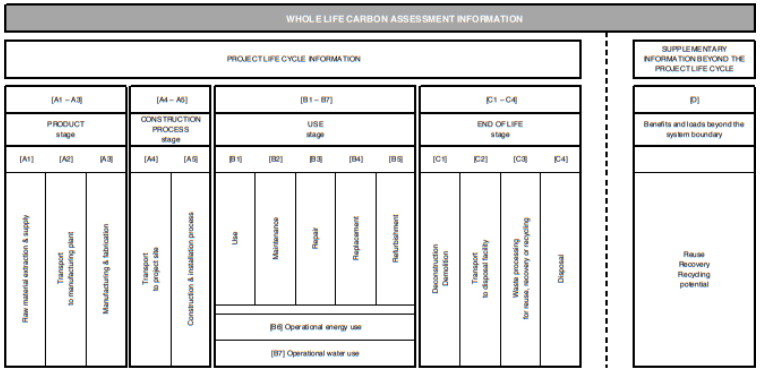

Figure 2: Life cycle modules as defined in the RICS 1st Edition

[5] *EN 15897:2011 – Sustainability of Construction works – Assessment of environmental performance of buildings – Calculation method Figure 6 details the Life Cycle Modules Section 7.4 details the System boundaries that the assessment covers – accessed under corporate License – last edited 31/01/2012*

[6] *RICS Professional Statement on WLCAs 1st Edition – The version that the GLA mandates of the RICS Professional Statement on WLCAs – accessed June 2025.*

2.2 Assessment scope

The materials, products and technologies analysed in this WLCA are those that fall within the RICS New Rules of Measurement (NRM) Level 2[7], as shown in **Table 2**. Any materials not detailed in the table are outside the scope of this assessment.

For any building elements where product or material data was unavailable at RIBA 3B, industry benchmarks and proxy data were used based on RICS guidance and the assessor's professional judgement.

As the Proposed Development progresses into more detailed design stages, specific material data is expected to become available and should be incorporated into future updates of this WLCA, providing a more accurate forecast of carbon emissions.

Table 2: Applicable NRM Level 2 elements from the Proposed Development.

Group Element	Element	Applicable to the development
1-Substructure (SUB)	1-Substructure	Yes
2-Superstructure	1-Frame	Yes
2-Superstructure	2-Upper floors (UF)	Yes
2-Superstructure	3-Roof	Yes
2-Superstructure	4-Stairs and ramps	Yes
2-Superstructure	5-External walls (EW)	Yes
2-Superstructure	6-Windows and external doors	Yes
2-Superstructure	7-Internal walls and partitions (IW)	Yes
2-Superstructure	8-Internal doors (ID)	Yes
3-Internal finishes	1-Wall finishes (WF)	Yes
3-Internal finishes	2-Floor finishes (FF)	Yes
3-Internal finishes	3-Ceiling finishes (CF)	Yes
5-Services	1-Sanitary appliances (SA)	Yes
5-Services	2-Services equipment (SE)	Yes
5-Services	3-Disposal installations (DI)	Yes
5-Services	4-Water installations (WI)	Yes
5-Services	5-Heat source (HS)	Yes
5-Services	7-Ventilation systems (VS)	Yes
5-Services	8-Electrical installations (EI)	Yes
5-Services	10-Lift and conveyor installations	Yes
5-Services	11-Fire and lightning protection	Yes
5-Services	12-Communication, security and control systems	Yes
8-External works	1-Site preparation works	Yes
8-External works	2-Roads, paths and paving	Yes
8-External works	3-Soft landscaping, planting and irrigation systems	Yes
8-External works	4-Fencing, railing and walls	Yes
8-External works	5-Site/street furniture and equipment	Yes
8-External works	6-External drainage	Yes
8-External works	7-External services	Yes

[7] *RICS New Rules of Measurement 2 – this document details standardised rules for assigning categories to construction materials and building locations.*

With the exception of information on the specific quantities of servicing equipment and associated cabling, design and cost information was provided in significant detail for all other material elements; this information can be found in the relevant disciplines deliverables as outlined in **Table 3**.

Furthermore, many elements listed in the Cost Plan could be attributed to a verified Environmental Product Declaration (EPD), greatly increasing the robustness of the assessment process. This position marks a significant step towards an accurate and precise carbon assessment. Where complex building elements were *not* able to be matched to an EPD directly, the following hierarchy has been used to source and extrapolate appropriate carbon data.

Figure 3: Data validity hierarchy for Whole Life Carbon Assessments.

For these systems, recognised benchmarks and commonly used construction materials (Stage 3 in **Figure 3**) have allowed these elements to be successfully incorporated into the assessment. Where proxies have been used, details have been provided in **Section 2.3.2** of this assessment. As the Proposed Development design progresses into RIBA 4 and construction, specific materials data will become available, and will be incorporated in updates to this report, to give an increasingly accurate assessment of expected carbon emissions.

It should be noted that were elements (as sourced from, for example, information located in the Cost Plan) which do not count towards the carbon impacts of the Proposed Development such as "Builder's Work in Construction" and "Allowances"; these items have therefore been excluded from this assessment.

2.3 Data Sources

Information provided in **Table 3** includes the source of construction details, as well as the additional demolition work, structural work, internal partitions, floors, ceilings (and finishes to both) and mechanical services.

Materials data for the Proposed Development has been obtained from the design team and the Rex Procter Partners Cost Plan(*Cost Plan 2 New Build – 24/08/2024*). The materials selected in this assessment represent those used for the *entire capital cost* of the Proposed Development in its current design state, at RIBA 3B. The data sources presented in **Table 3** are listed according to RIBA Group Element.

Table 3: Data sources for each project discipline's work.

Discipline	Building Element Data	Data Source
Architecture	Group 2 – 3	Stage 3: BIM Model (REVIT), Schedules, and Cost Plan
Building Services	Group 5	Stage 3: Cost Plan
Civil Engineering	Group 8	Stage 2: Cost Plan
Landscape Architecture	Group 8	Stage 3: Drawings (AutoCAD), Cost Plan
Structural Engineering	Group 1 & 2	Stage 3: Cost Plan and REVIT Model

To note:

- The main building services for the Proposed Development comprises of LED lighting systems, electric radiators, Mechanical Ventilation Heat Recovery (MVHR), and associated pipework. The scope of the Proposed Development includes a passenger lift and solar photovoltaic panels, which are assessed within this WLCA.
- As the design progresses into RIBA 4, it is expected that more complete data will become available, e.g. material specifications, product schedules, manufacturer data. Any newly available data will help to shape a more robust life cycle module analysis of the Proposed Development's overall embodied carbon impact; further carbon assessments should be undertaken once refined information has been acquired.
- The available material data used in this assessment accounts for the entire capital cost of the Proposed Development. It is expected that some minor changes will occur during the technical design (RIBA 4); these minor changes will be identified and modelled as part of the As-Built WLCA, for the Proposed Development, after construction. As the Proposed Development's delivery process progresses, it will remain essential that all changes to the current design are communicated, so that the savings or impacts to the design can be assessed. Where any significant savings or impacts are identified, these will be formally quantified and reported to the project team for agreement and approval.
- The assessment also encourages an environment in which any materials deviating from the original specification (as proposed by a future contractor) are provided with an EPD, to ensure accurate and precise carbon comparisons and assessment.

2.3.1 Missing Project Data

All stage-applicable material elements of the design have been quantified, and hence there are currently no outstanding material data within this WLCA. Furthermore, the level of *confidence* in the quality of these data is extremely high, due to the robust nature of the designs and sources of information used.

Due to the stage of the design (and taking into account the benchmarks provided by the GLA) data on furniture, fixtures and equipment (FFE) were not yet available for analysis, and hence have not been included in the current calculations. Once a detailed schedule of accommodation has been confirmed at RIBA 4, FFE elements can be included. Note: the GLA allows benchmarks for the FFE quantification for 'other building typologies'; however, as the Proposed Development is made up of different building types, the benchmarks for 'other building typologies' would result in a significant under estimation of the impact, and hence have not been used..

2.3.2 Data Assumptions and Limitations

The following assumptions apply to this WLCA:

- Lifespan: This assessment assumes a standard lifespan of 60 years for the Proposed Development, as per RICS 1st Edition guidance.
- In-use assumptions: In accordance with RICS guidance, Modules B2 (Maintenance) and B3 (Repair) have been calculated as percentage estimations of A1-A5 (Materials, Transport and Construction & Installation).
- Transportation distances: As set out in the RICS guidance, the transport distances for the materials to be used are described in **Table 4.**

Table 4: RICS 1st Edition recommended assumptions for material transport distances.

Transport scenario	Kilometres by road	Kilometres by sea
Locally manufactured (e.g. concrete, aggregate, earth)	50	-
Nationally manufactured (e.g. plasterboard, blockwork, insulation)	300	-
European manufactured (e.g. CL, façade modules, carpet)	1,500	-
Globally manufactured (e.g. specialist stone cladding)	200	10,000

With reference to **Table 4**, is assumed that the vehicles transporting construction materials across land are 'average laden diesel vehicles', to account for both the fully laden journey and the empty trip back. Those items travelling by sea are assumed to be standardised cargo containers. The distances quoted include a generic allowance for interim storage depots.

- Waste: At the time of writing this report, standardised manufacturing waste generation rates, as provided by OneClick LCA databases and aligned with RICS 1st Edition, have been assumed. Wastage rates may (in reality) vary according to different installation and construction approaches (and for different product applications and locations); however, datapoints used are generally industry accepted.
- Water consumption: The operational water consumption is based on an average of 11,000 litres/pupil/year figure for secondary schools[8]. Noting that the current absence of specific data on shower usage for the Proposed Development impacts the accuracy of this estimate and will require refinement at the detailed design stage.
- Energy consumption: In line with the London Plan Guidance, operational carbon emissions have been calculated using the CIBSE TM54 methodology.
- Construction site scenarios: The average construction site activities based on RICS 1st Edition scenarios have been applied. These scenarios use the gross internal floor area (GIFA – m^2) of the Proposed Development to estimate the construction site uses, energy, water use, the additional materials used on the site (that do not constitute part of the asset), waste, additional trips, and worker transport.
- Material choices and constructions: Whilst the exact specification of the majority of construction materials is known, some elements - as laid out in **Section 2.2 -** have been replaced by industry benchmarks used across the UK. The intention of this report is to refine the data during the detailed design stage.

[8] *Anglian Water - School Water Audit – Data used to calculate water consumption – accessed June 2025.*

3.0 Results

RICS Professional Standard 1st Edition requires that the results are broken down by building element and that the results inform the completion of the GLA 'referrable scheme spreadsheet'. The spreadsheet is provided separately with the results of this section covering the reporting requirements of the GLA and RICS 1st Edition process statements.

Herein, this chapter highlights the key findings from the WLCA of the Proposed Development. The results have been obtained and calculated in accordance with the stated methodology and have factored in the assumptions and limitations described in **Section 2.3.2**.

Values are presented in tonnes or kilogrammes of carbon dioxide equivalent (CO_2e), as most appropriate to the context in which they are described e.g. for WLCA reporting or industry benchmarks, respectively.

3.1 GLA Planning Comments

This report and the subsequent results have been updated to include and respond to the GLA planning comments returned as part of the application's submission.

As part of the WLCA submission two comments were returned, Table 5 outlines the comments and the responses as part of this report. Additionally, the Circular Economy Statement, prepared by Pick Everard (*R001HAO - 240691 - Phoenix Academy Redevelopment - Circular Economy Statement - planning submission*) also contained comments which had a knock-on effect on the WLCA. These applicable comments are presented here for clarity.

Table 5: GLA planning comments and Pick Everard's WLCA response.

GLA Response Memo Point	Comment Description	Pick Everard Response
Whole Life Carbon Assessment		
11	The applicant should reasonably explain the reasons for the A1-A5 emissions being above the WLC benchmark.	Pick Everard have returned the Planning Memo with detailed explanations for these two points.
24	The applicant should clarify why FF&E emissions are omitted from the WLCA.	
Circular Economy Statement		
5	Queries were raised around the material weighting and the presence of materials in specific building elements.	A review of the materials and design of the project has occurred, and changes have been made to update previous material assumptions, choices, and design.

3.2 The Proposed Development – Results per Life Cycle Module

The carbon emissions across lifecycle Modules A to D, as calculated for the Proposed Development, are presented in **Figure 4. Table 6** provides a detailed description of the scope and status of each element shown **Figure 4.**

Key findings

- **Significant impacts** made through the use of inorganic materials (predominantly concrete) this is compounded by the size of the Proposed Development as well as the rigorous requirements for regulator compliance for certain materials.
- **Significant impacts** from replacement activities (Module B4) are expected, due to the lifespan of equipment and the design life of the Proposed Development. The main contributing materials to this module are the plasterboard wall linings (30-year lifespan), internal paint (5 years) and some of the smaller timber elements such as doors and linings (5-20 year lifespans).
- **Construction values presented are (at this time) an assumption.** This figure was taken from the RICS 1st Edition guidance for construction impacts. It is formed from industry records and as such is a good approximation but is still not specifically for the Proposed Development.
- **Where end of life management routes can from ascertained from industry and manufacturer information** (e.g. commitments to reuse, and recycle) the benefits derived from Module D would be expected to increase.

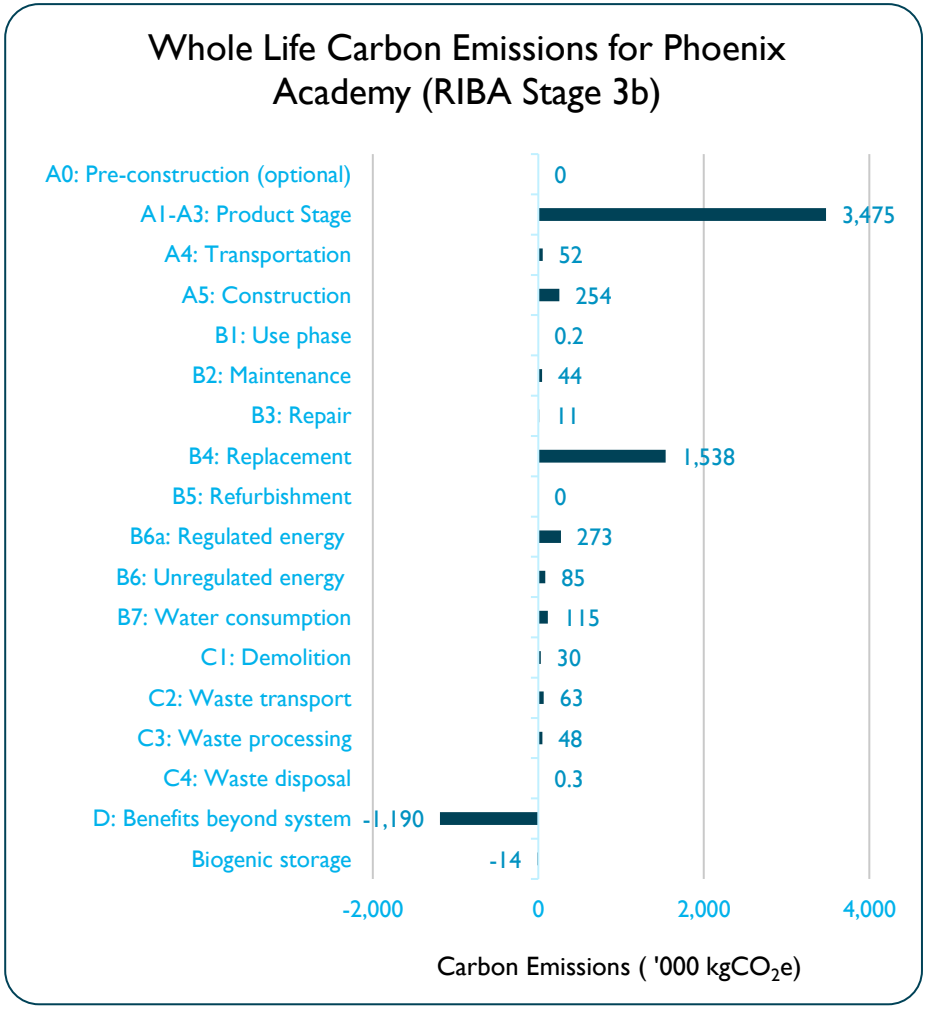

Figure 4: Whole life carbon emissions broken down by life cycle module, presented in tonnes CO_2e.

Table 6: Results of Base Build WLCA by life cycle module (kgCO2e) with commentary.

Life Cycle Module	$kgCO_2e$	$kgCO_2e/m^2$	Commentary
Materials			
A1-A3: Product stage	**3,475,489**	**791**	Module A1-A3 accounts for the materials outlined in **Section 2.2** of this report. The majority of the data assessed has been sourced from EPDs from certified manufacturers and providers.
A4: Transport	**51,876**	**12**	Module A4 is formed from the RICS assumptions outlined in **Table 4**. This module's data should be refined once a contractor is appointed i.e. sourcing pathways are understood.
A5: Construction & installation	**253,755**	**58**	Module A5 is based on a GIA (m^2) benchmark which is taken from a variety of construction projects, as sourced from RICS 1st Edition. The value presented adjacent is an estimation of this module's impact and should be refined once a contractor is appointed. The value would be expected to decrease, once construction has finalised and actual data have been acquired.
In-Use			
B1: Emissions to the environment from the use of the product(s)	**220**	**0.1**	Module B1 focuses on the emissions during the in-use stage of building through operational emissions through materials and products such as the mechanical services refrigerant.
B2: Maintenance	**43,930**	**10**	Estimated based upon the RICS benchmark of $10kgCO_2e/m^2$ or 1% of Modules A1-A5, whichever is greater. This module focuses on regular maintenance to existing systems and materials as they progress through their life cycle.
B3: Repair	**10,983**	**3**	Estimated based upon the RICS benchmark of 25% of Module B2 maintenance impacts, for relevant items only. Additionally, this contains recently published figures for flooring maintenance.
B4: Replacement	**1,537,999**	**350**	Module B4 relates to the service life of the key materials needing replacing when they reach their end of life. Module B4 is a significant contributor because it is directly correlated to Modules A1-3 (materials); this assessment assumes a like-for-like replacement of material that reach their end of life during the Development's lifetime.
B5: Refurbishment	**0**	**0**	It is currently assumed that for this WLCA the Development will not undergo significant refurbishment across its lifetime. Any refurbishments will be captured within their specific WLCA.
B6a: Regulated energy consumption	**273,107**	**62**	Data has been informed by the thermal and energy modelling performed by the Pick Everard Team in line with the TM54 methodology.
B6b: Unregulated energy consumption	**84,666**	**19**	Data has been informed by the thermal and energy modelling performed by the Pick Everard Team in line with the TM54 methodology.
B7: Water consumption	**114,737**	**26**	This information has been provided through the building services team and follows standardised calculation methodologies in order to obtain the annual water consumption rate.
End of Life			
C1-C4 (end of life) excl. biogenic carbon	**141,607**	**32**	The scenario chosen for the Proposed Development assumes no further demolition outside of the processes currently planned for this educational facility. Once the scheme has a defined End of Life strategy an assumption can be made which will increase this module's value.
TOTAL	**5,988,369**		
Modules reported separately			
Biogenic Carbon Storage	**-14,075**	**-3**	Biogenic Carbon Storage relates to the carbon sequestered within organic materials through processes such as photosynthesis. This value acts as a negative to the total emissions of the Development (**5,988,369 $kgCO_2e$**); taking into account the biogenic carbon storage value modelled, the total carbon emissions for the Proposed Development would reduce to **5,974,294 $kgCO_2e$ (-2%).**
D: Benefits beyond the system boundary	**-1,189,811**	**-271**	Module D accounts for the potential future carbon savings that result from reusing or recycling materials at their end of life, offsetting the carbon emissions associated with new material production. This module is reported separately and does not contribute towards the totals.

3.3 Proposed Development – Results per resource type

It is important to understand where, across the project lifecycle of a Proposed Development, the most significant carbon emissions occur; this helps focus attention on targeted reductions for the existing (and future similar) project(s). **Figure 5** provides the carbon emission data from the Proposed Development, broken down by resource type.

It is noteworthy that the 20% alloted to 'other classifications' covers a range of elements such as construction impacts and small component elements which make a small individual contribution (less that 5%, each) to the carbon emissions of the scheme.

Key findings

- A significant contribution to the Development's carbon emissions is from the steel 18%, 2.2.1 in **Figure 5**). The comparatively larger carbon impacts here result from of the use of new steel for a significant proportion of the Proposed Development superstructure.
- A large contribution has been modelled from the electrical installations (22%, 5.13 in **Figure 5**); these elements are directly attributable to the photovoltaic panels planned.

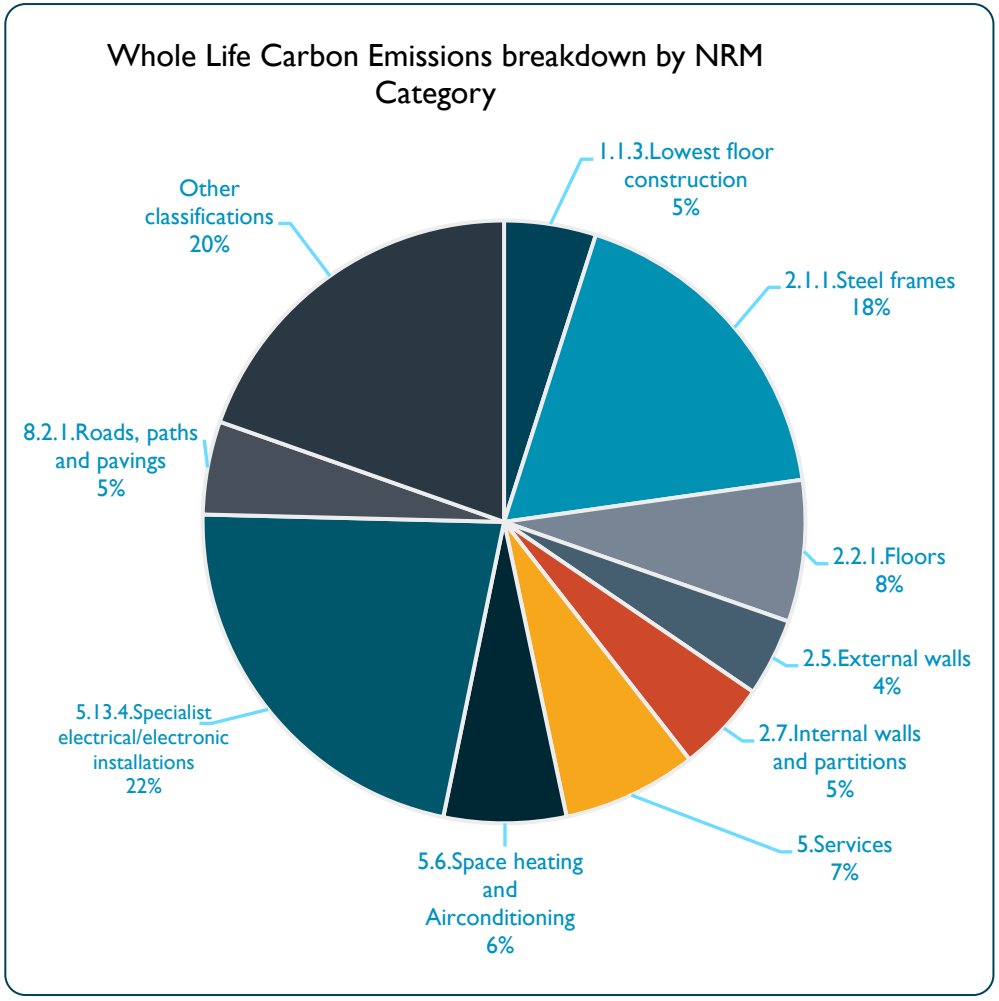

Figure 5: Whole life carbon emissions for the Base Build broken out by NRM category.

3.4 Performance against GLA carbon benchmarks

As the Proposed Development falls within the requirements of a GLA referrable scheme, the results from Section 4.1 and 4.2 must be compared against the GLA Benchmarks. These benchmarks currently cover upfront carbon emissions (Modules A1-A5), in-use and end of life emissions (Modules B-C, combined) and the embodied carbon life cycle impacts across modules A-C. It is important to note that these benchmarks exclude modules B6, B7 and D, as laid out by the GLA guidance. However, the results *do* include the carbon sequestration potential of the proposed materials.

Figure 6 shows the carbon performance of the Proposed Development, when compared to industry refurbishment benchmarks for 'upfront carbon' (Modules A1-A5) only.

Figure 7 shows the in-use and end of life carbon performance (Modules B-C, but excluding B6 and B7) of the Proposed Development.

Figure 8 shows the Modules A-C carbon performance, against the respective GLA benchmarks

Data in **Figures 6**, **7 and 8** have been kept separate as to align with the GLA guidance.

Key findings

The carbon emissions from the Proposed Development are higher across all the GLA benchmarks. This finding signifies that the lifetime impact of the specified materials are carbon intensive.

These findings reinforce the need to investigate and lower the embodied carbon impact of the Proposed Development, as it progresses to the next RIBA stage.

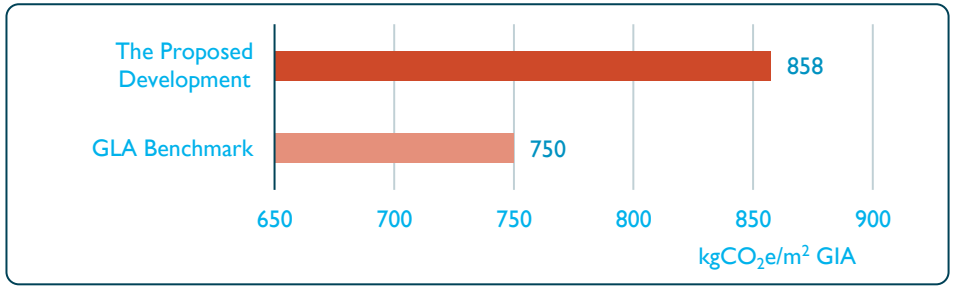

Figure 6: The Proposed Development's upfront carbon compared to the GLA Benchmark

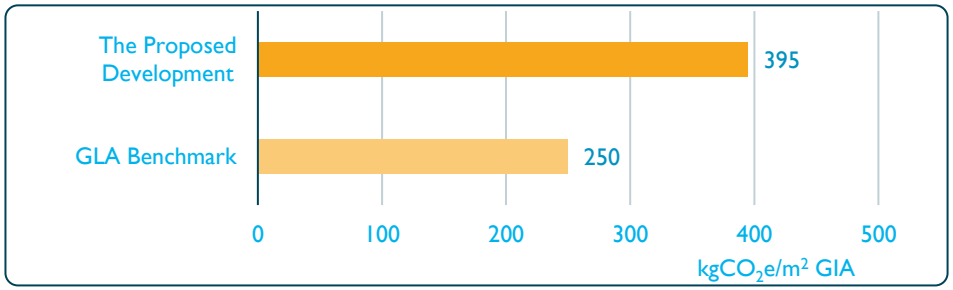

Figure 7: The Proposed Development's Modules B-C compared to GLA Benchmark.

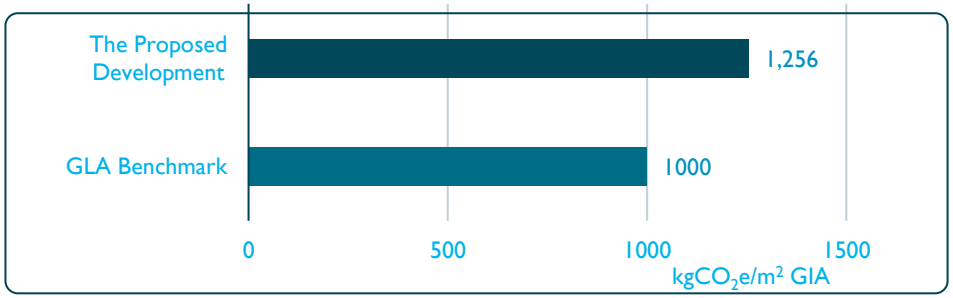

Figure 8: The Proposed Development's whole life carbon performance, against the GLA benchmark (excluding Modules B6, B7 and D).

3.5 Material End of Life Analysis

As part of RICS reporting requirements, materials mapped to a WLCA should report on end-of-life processes which - at the time of publication of this report - still contribute to (adversely affect) carbon in Modules C2-C4, as well as parts of Module D of the Proposed Development.

The modelling parameters for this development rely heavily on Business As Usual (BAU) end of life processes such as reusing, recycling and disposal, as based on parameters set by RICS guidance. Naturally, the parameters currently used can be further refined with specific knowledge on how certain elements of the building will be managed at their (respective) end of life. For example, if - through circular economy practices – greater certainty can be placed on end-of-life actions across the Developments design elements, these can be modelled in the As-Built WLCA to help refine (reduce) the Module C and D impacts.

3.6 Commitments to reduce carbon emissions

At RIBA Stage 3B, the carbon emissions of the Proposed Development are higher than the GLA educational building benchmarks. Accordingly, the commitments outlined herein describe the overall strategy to reduce carbon and other sustainability impacts across the life of the scheme, and provide suggestions of how to apply the findings of this report to the benefit of future portfolio of projects delivered by Future Academies.

3.6.1 Explore further carbon reduction opportunities

The first commitment of this report is to work with the design team to investigate the provided design hotspots and work collaboratively to design out carbon intensive areas and seek new materials to lower the embodied carbon.

At the time of publication, the New Teaching block design is above the upfront carbon benchmark for the GLA. The scheme therefore commits to undertake design work to reduce the embodied carbon of this asset (particularly across the frame. services and flooring elements), as an area of focus in the RIBA 4 design. The goal will be to bring the development further in accordance with best practice benchmarks.

The design team will also research and implement viable options to further reduce the embodied carbon emissions associated with this building. One approach could, for example, be to secure a higher recycled content for structural steel, than the (currently) assumed 'generic 20%'.

3.6.2 Investigate the potential for organic material usage

The second commitment of this report is that Future Academies will use the findings described in Section 4 to investigate the potential of increasing the proportion of organic materials (such as timber) in the design, to further reduce the carbon impact of the scheme.

Whilst Future Academies has a wide variety of specifications required to meet regulatory compliance, there are a number of existing organic materials which can be utilised in the design. This will aid in providing biogenic carbon storage (sequestration) which will help lower the development's carbon footprint. Adopting organic materials can help mitigate the impacts from the currently carbon intensive materials specified for the new build portion of the design.

3.6.3 Develop specific end of life processes

The third commitment of this report is that Future Academies will develop an education specific end of life process for the key elements identified in Section 3.3 of this report. This will demonstrate further Future Academies' commitment to circular economy best practice, by reducing waste and increasing the reusability and recyclability of both traditional and bespoke building elements.

This WLCA has used a suite of EPDs and TM65 certificates to model the carbon impacts of the materials specified. Accordingly, the end-of-life process assigned to each material often assumes good practice demolition and/or recycling approaches will be adopted. Future Academies will work to prepare a commitment and process map to increase the direct recovery and reuse of materials, either within the Proposed Development itself, the residential development or across Future Academies portfolio. Where direct reuse is not possible, plans should seek opportunities across the Future Academies supply chain or through partnerships with other schools and organisations.

4.0 Summary

This RIBA Stage 3B WLCA report has been prepared for the redevelopment of Phoenix Academy in Shepherds Bush, London, in accordance with the requirements of the London Plan, and using OneClick LCA software.

This assessment aligns with RICS WLCA Professional Statement 1st Edition, and benefits from the use of OneClick LCA software to analyse results. It has been prepared so that any design changes that impact the materials specified and (by extension) construction carbon impacts can be recorded and modelled in a future WLCA.

Whilst this WLCA currently only covers the new build elements of the Proposed Development, it is important to note that these components are expected to elicit the greatest embodied carbon emissions of the entire scheme.

Summary results for the Proposed Development are provided in **Table 7**.

Table 7: Summary results for the Proposed Development under a RICS 1st Edition WLCA.

Building asset	Building classification	GIA (m^2)	Whole Life Carbon (all modules, including sequestration) ($kgCO_2e$)	Module D
Multi-storey Teaching Block	Education (Secondary)	4,393	5,974,294	-1,189,811

The results of this report show that the lifetime carbon impact of the scheme is **5,974,294 $kgCO_2e$**, across a GIA of 4,393 m^2; this generates a carbon intensity of **1,360 $kgCO_2e/m^2$ GIA**. These totals *include* the negative emissions (i.e. removals) associated with biogenic carbon, but exclude the carbon associated with Module D (elements beyond the system boundary), as the latter must be reported separately.

Whilst the carbon impacts of the Proposed Development exceed the relevant GLA benchmarks, there remains the potential to achieve further reductions through the RIBA 4 design programme. Any reductions made will help to reduce the carbon impact of the entire scheme, for which the Proposed Development is one subpart. Some key commitments to achieve this goal have been set out in **Section 3.6** of this report, with a notable focus on organic materials, detailed specifications for EPDs and design changes to remove carbon from the design.

To ensure all carbon impacts associated with the Proposed Development are captured, this WLCA must be updated at (at least) the post-construction stage.

Appendix A – GLA WLCA spreadsheet

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