



Method Consulting

Intelligent engineering,
sustainable buildings

Brunner House Redevelopment (New Extension)

Sustainability Statement

Channing School

December 2023

Document History

This document has been revised and issued as below:

Revision	Date	Description	Created by	Approved by
P01	14/12/23	Sustainability Statement issued for Planning	AMG	NCF

Executive Summary

Method Consulting LLP has been appointed to produce a Sustainability Statement as part of the Planning application for the proposed new development at Channing School.

The proposed development consists of both a refurbished existing building and an extension, with this Sustainability Statement focused solely on the extension. This statement has been prepared to demonstrate only where the extension of the proposed development meets or exceeds the recommendations of the London Plan 2021 as per the GLA Energy Assessment Guidance (June 2022), and the Haringey local plan. The proposed new development is categorised as a minor development, but under local policy must still adhere to the London Plan's Energy Hierarchy for a major development.

Method Consulting LLP has also been appointed to produce a Thermal Comfort report and Energy Statement (including a Low Zero Carbon Feasibility Study) which should be referred to for further detail in support of this document.

This report demonstrates that the proposed development is in compliance with relevant planning policy, including the London Plan, the Haringey Development Management DPD, the Haringey Strategic policies and the Haringey Sustainable Design & Construction SPD.

In line with Policy SP4, a BREEAM assessment is being undertaken for the development, which covers the new extension only. BREEAM covers various sustainability topics including:

- Management
- Health and wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Pollution

The development is targeting BREEAM Very Good, with an aspiration for Excellent, which requires a minimum total score of 55% for a Very Good rating. A summary of the BREEAM pre-assessment is included in Appendix A which shows the targeted credits for the assessment. The pre-assessment targeted score is currently 69.25% showing that a Very Good rating should be achievable. All Excellent minimum standards have been targeted as part of the target score and the assessment will be reviewed as the design progresses to see if an Excellent rating is achievable.

A pre-assessment is included with the submission to show the targeted credits.

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1 Introduction

Method Consulting LLP has been appointed to produce a Sustainability Statement as part of the planning application for the proposed new Brunner House Extension development at Channing School.

This report covers the following:

- Relevant planning policy and its requirements.
- Overview of BREEAM targets and pre-assessment
- How the planning policy has been addressed in line with the Haringey Sustainable Design & Construction supplementary planning document (SPD).

1.1 Site location

The proposed development is located on the grounds of the existing Channing School as shown highlighted in red in Figure 1 and . Henceforth, it will be referred to as the 'Site'.



Figure 1: Location of the Site for the proposed development (red)

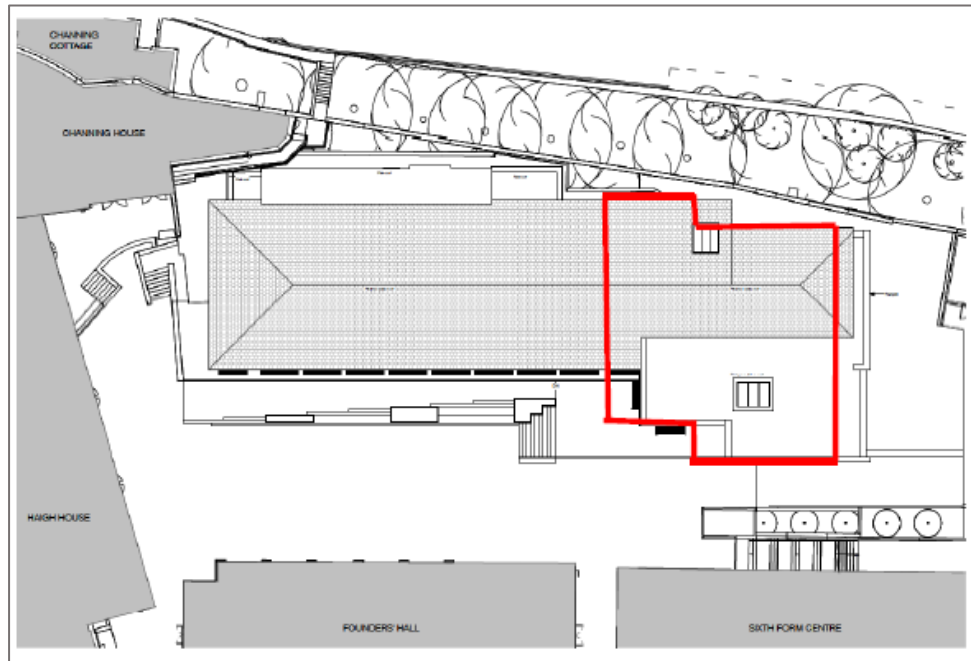


Figure 2: Location of proposed development (extension in red)

1.2 Development description

The proposed development consists of both a refurbishment to the existing Brunner House and a 3-storey extension, with associated landscaping. This Sustainability Statement, and the BREEAM assessment, focus solely on the new extension to the Brunner House. The proposals for the extension consist of a new basement and science and design and technology classrooms.



Figure 3: Brunner House Existing and Proposed Sections

(taken from NVB Architects CHA-NVB-BHR-ZZ-DR-A-2200-P02-S2-Brunner House Existing & Proposed Sections - Site Sections A and B)

2 Relevant planning policy

2.1 National Policy – NPPF

The National Planning Policy Framework (NPPF) was published on 5th September 2023. This document sets out the overarching policies for development in England and states that:

‘So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development.’ (NPPF, 2023). Paragraph 11 states, ‘all plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects’.

The NPPF also references the 17 UN Sustainable Development Goals, which are illustrated below:



Key points within the NPPF of relevance and which have therefore been considered as part of this proposal are:

- Making effective use of land;
- Achieving well-designed places;
- Meeting the challenge of climate change and flooding;
- Conserving and enhancing the natural environment.

2.2 Regional Policy – The London Plan (adopted March 2021)

The latest version of the London Plan sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20 – 25 years.

The following section outlines key policies set out in the London Plan which are relevant to the proposed development and this Energy Statement.

Within the following policies, “major developments” are defined as those with 10 or more units and those with >1000 m² of floorspace. The proposed development at Channing School is therefore categorised as a minor development. However, under Haringey local planning policy, the development must still adhere to the London Plan’s Energy Hierarchy for a major development.

2.2.1 Policy SI 2 – Minimising greenhouse gas emissions

The London Plan requires that all major developments should be net zero carbon, requiring that greenhouse gas emissions in operation are minimised, along with overall energy demand. This requires developments to follow the energy hierarchy of Be Lean, Be Clean, Be Green, and Be Seen.

A minimum on-site reduction of 35% beyond current Building Regulations is required for major development, and a saving of at least 15% should be achieved through fabric efficiency measures alone for non-domestic applications. Any shortfall in carbon savings on-site is to be met through agreements with the local borough.

2.2.2 Policy SI 3 – Energy infrastructure

This policy requires that developers review the feasibility of procuring energy for heating and hot water from existing heat networks, or through provision of a new heat network – be that a site-wide network, or creation of a local network with discussions being held between developers and the local borough council. Major developments should have a communal low-temperature heating system where within a Heat Network Priority Area.

2.3 Local Policy – the Haringey Development Plan DPD 2017-2026 (adopted 24 July 2017)

Haringey's development plan is currently made up of the Strategic Policies, Development Management Policies, Site Allocations and Tottenham Area Action Plan, alongside the London Plan and the North London Waste Plan. The following section

outlines key policies set out in the Development Management DPD (2017-2026) and Strategic Policies (2017-2026) which are relevant to the proposed development and this Energy Statement.

Note the Haringey development plans contain references to London Plan 2016 however the local plan adheres to present London Plan 2021.

2.3.1 Policy DM21: Sustainable Design, Layout and Construction

All new developments, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should:

1. Apply the energy hierarchy to minimise energy use in order to meet, and if possible, exceed minimum carbon dioxide reduction requirements;
2. Wherever possible, use building materials with high environmental performance ratings.

As the extension to the Brunner House is considered a minor development, section 4.26 of Policy DM21 should be given particular attention as it notes “the London Plan requirements for major development may not be fully financially viable or technically feasible for minor development. Much will depend on individual site circumstances and the nature and scale of development proposed. However, the Council is mindful of the cumulative impact of development in the Borough and will therefore seek to ensure that all proposals adequately investigate and deliver opportunities for incorporating sustainable design, layout and construction principles wherever possible. Consideration should be made at the very early stage in the design process to ensure maximum use and benefit”.

London Plan Policy 5.2 (London Plan 2021 SI 2) states that development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the energy hierarchy, as follows:

1. Be lean: use less energy
2. Be clean: supply energy efficiently.
3. Be green: use renewable energy

Policy DM21 notes that the existing building stock in Haringey factors significantly in local carbon emissions and that many properties are energy inefficient. Sustainable retrofitting can therefore offer an opportunity to improve the environmental performance

of existing buildings, especially where conversions, refurbishments, changes of use and extensions are proposed.

Policy DM21 seeks to encourage proposals for minor development to incorporate energy efficient measures (such as internal roof, floor and wall insulation) as a cost-effective way to reduce carbon emissions. In principle, external wall insulation is also supported, however it must consider character and historic significance of the existing building and surrounding area, and consider other Local Plan policies, particularly Policies DM1 and DM9. The use of energy efficient appliances is also strongly recommended as a simple way to reduce energy use and carbon emissions.

2.3.2 Policy SP4: Working towards a low carbon Haringey

Over the lifetime of the Local Plan, reducing energy use in buildings and working towards a low carbon borough will be one of the key challenges facing Haringey. The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.

1. In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:
 - 1.b. From 2011 onwards all new non-residential development shall be built to at least BREEAM “very good” standard and should aim to achieve BREEAM “excellent” or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.
2. The Council will promote low- and zero-carbon energy generation through the following measures:
 - 2.d. All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from onsite renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.

3 Sustainability Statement

The Haringey Sustainable Design & Construction SPD has been considered to address compliance against relevant sustainability planning policy; including the London Plan, the Haringey Development Management DPD and the Haringey Strategic policies.

3.1 BREEAM

3.1.1 Policy SP4

Policy SP4 of Haringey's Strategic Policies requires a minimum of a BREEAM Very Good, but with an aim to achieve BREEAM Excellent, for all new non-residential developments. BREEAM (Building Research Establishment Environmental Assessment Method) is the most widely used sustainability rating system in the UK with different award ratings as follows:

Rating	Representative of	% score
Outstanding	Top < 1%	≥85
Excellent	Top 10%	≥70
Very Good	Top 25%	≥55
Good	Top 50%	≥45
Pass	Top 75%	≥30

An Excellent is typically representative of the top 10% of assessments and can be a challenging target.

BREEAM contains a set of sustainability categories which each includes a set of individual credits and criteria, with a points-based assessment framework resulting in the overall rating.

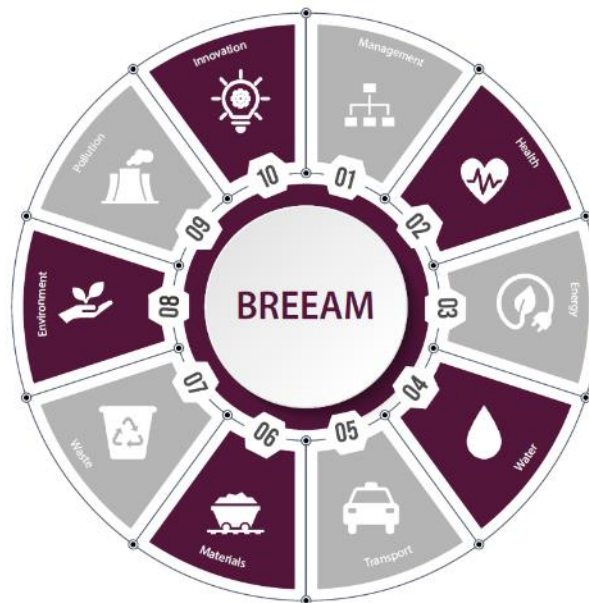


Figure 4: BREEAM Categories

The Brunner House new build extension will be assessed and has been registered under BREEAM New Construction V6: Education. The registration number is BREEAM-0117-3715.

BREEAM and sustainability has been embedded into the design process from the early stages and the project is on track to achieve a Very Good rating, with a current targeted score of 69.25%. A BREEAM Pre-Assessment has been carried out by a licensed BREEAM assessor for the proposed building. A BREEAM Accredited Professional at Method has been part of the design team from the outset and as part of the pre-assessment process, the team have committed to a number of sustainable features in order to target a Very Good rating as a minimum.

It is noted that Policy SP4 requires the development to 'aim' to achieve a BREEAM Excellent rating. This has been factored into the BREEAM pre-assessment to aim that all BREEAM minimum standards for an Excellent rating are targeted, and the assessment will be continuously reviewed as the design develops to assess whether an Excellent rating is achievable and which credits could be targeted.

BREEAM V6 New Construction requires a number of credits to be completed at RIBA Stage 2. These have been actioned accordingly by the design team and have been reviewed by the BREEAM assessor for compliance. Undertaking this mini-assessment of Stage 2 reports reduces risk later down the line and helps check the design is on track for the high BREEAM rating.

A BREEAM Pre-Assessment summary is included in Appendix A which details the targeted credits.

3.1.2 BREEAM Timescales

An interim assessment will be completed once the design is complete. This will be followed by the final assessment once the development is completed.

These assessments require a large number of documents to be assessed and reviewed and formal assessments can take some time to finalise for submission to BRE. In addition, BRE are reporting long timescales for QA and certification, which can be in the order of 18 weeks. For this reason, it is not possible to submit a final certificate before occupation of the building. A final certificate can be expected to be received post 6 months project completion, or longer.

3.2 Haringey Sustainable Design & Construction SPD

The following sections of the Sustainability Statement are structured around the Haringey Sustainable Design & Construction SPD. This document provides guidance on how development in Haringey should be designed to ensure it is as sustainable as possible, and includes details on what should be included in the Sustainability Statement to demonstrate compliance with the London Plan, the Haringey Development Management DPD and the Haringey Strategic policies.

3.2.1 Energy & Carbon

Energy performance has been a key consideration for the proposed development. A high number of credits are targeted in the BREEAM Energy section, including:

- Exceeding the four mandatory credits for Energy Performance using Building Regulations Part L (Ene01) for an Excellent rating
- Sub metering end energy use to allow occupants to better understand energy use and take action where higher than normal usage occurs (Ene02)
- Efficient external lighting (Ene03)
- Designing for and including LZC technologies (Ene04)
- Opting for energy efficiency measures within transportation systems (Ene06)
- Including energy efficient equipment for unregulated uses (Ene08)

Refer to the Energy Statement produced by others for full details.

3.2.1.1 The Energy Hierarchy

Section 3.1 of the Sustainable Design & Construction document notes that development proposals should promote the 'Energy Hierarchy' and include a detailed energy assessment to show how a reduction in energy use and carbon dioxide emissions from the development will be achieved.

Refer to the Energy Statement produced by others for full details.

3.2.1.2 Site Microclimate

Section 3.2 of the Sustainable Design & Construction document requires a microclimate assessment for buildings of 10 storeys or above. The proposed extension to the Brunner House is below this threshold and therefore a microclimate assessment is not necessary.

3.2.1.3 Passive Design and Thermal Mass

Section 3.3 and 3.4 of the Sustainable Design & Construction document notes that all development proposals should maximise the potential for passive solar gain, consider the thermal mass of the building, avoid overheating during summer months without reliance on energy intensive mechanical cooling, consider the energy used in the building fabric, materials and fittings.

Page 28 of the Energy Statement notes that, as part of the Be Lean strategy, a range of passive and active energy efficiency measures are specified for the development, including:

- High-performance façade with optimising levels of insulation.
- Exposed thermal mass in external walls and soffits of classrooms.
- Solar control measures including brise soleil on the south and east facing façade, as well as vertical brise soleil on the north-east façade.
- Low air permeability.
- Daylighting sensor control, occupancy sensing controls and time switch.
- Variable speed pumping.
- Efficient ventilation systems with heat recovery.
- Demand control ventilation via gas sensor and speed control.
- HVAC systems have provisions for metering.

High performance fabric has been used to reduce the heating load, and proposed exposed thermal mass in external walls and soffits of classrooms reduce the need for

mechanical cooling. In addition, a target air permeability of $3\text{m}^3/\text{h}/\text{m}^2$ is targeted in line with the notional standards. Low fabric U values are targeted for the development, which can be found on page 10 of the Energy Statement.

Full details on the above can be found in the Energy Statement and the Thermal Comfort Report produced by others.

In addition, a Life Cycle Assessment has also been undertaken to look into the embodied carbon emissions associated with the building materials. Refer to section 3.2.7.3 for more detail.

3.2.1.4 Decentralised Energy Systems and Renewable Energy

The Low Zero Carbon (LZC) Feasibility Study (included in section 5 of the Energy Statement) confirms that photovoltaic (PV) panels and air source heat pumps (ASHPs) have been identified as the most suitable renewable energy technologies for the development.

Policy SP4 requires all new developments to achieve a reduction in predicted carbon emissions of 20% from onsite renewable energy generation. The proposed design currently exceeds this with a reduction of 34.6% achieved.

Refer to the Energy Statement produced by others for full details.

3.2.2 Changing Climate

A Thermal Comfort Report has been produced to demonstrate how the building has been designed to avoid overheating in summer months. The Energy Statement also provides information on how passive measures have been considered to reduce the energy demand from cooling. For example, proposed exposed thermal mass in external walls and soffits of classrooms reduce the need for mechanical cooling.

Refer to the separate Energy Statement and the Thermal Comfort Reports for full details.

3.2.3 Flood Risk

A Flood Risk Assessment (FRA) has been carried out for the site which concludes that the site is located in Flood Zone 1. This can be seen in Figure 5 below.

The FRA confirms that the site has a low risk of flooding from the following sources:

- Fluvial
- Tidal
- Surface water
- Sewers
- Reservoirs, canals and other artificial water sources
- Groundwater



Figure 5: Environment Agency Flood Map for Planning

Sustainable Drainage Systems (SuDS) are proposed to be incorporated into the development. These include blue-green roofs to provide attenuation and passive irrigation for the soft landscaping on the roof.

Refer to the FRA and SuDS Strategy Report produced by other for full details.

3.2.4 Water

3.2.4.1 Reducing the need for water

Section 6.1 of the Sustainable Design & Construction Document requires developments to minimise the need for water through installing efficient water fittings and plumbing. For example, dual flush toilets, low flow shower heads and leak detection systems.

The final specification of sanitaryware is yet to be finalised but will demonstrate a reduction in water demand through achieving at least Level 3 of the BRE's Water Efficient Consumption Levels of the BREEAM V6 criteria (credit Wat 01 Water

Consumption), which would generally represent a 40% reduction in water consumption over the BRE's assumed baseline. An example of how this could be achieved is given below, however the exact specification will be developed at a later stage:

- WCs: 3.75 litre effective flush
- Basin taps: 3.75 litres/minute
- Kitchen taps: 5 litres/minute
- Showers: 6 litres/minute
- Dishwasher (commercial): Default

As part of design development, it is expected these figures will change, within the tolerance allowable to achieve the overall 3 BREEAM credits under Wat 01.

Water supplies will be metered, and sub metered where required; typically sub meters will be included for areas consuming 10% or more of the total demand. Leak detection equipment and flow control devices are also proposed in order to meet BREEAM Wat03.

3.2.4.2 Supplying Water Efficiently

Blue roofs with a green roof overlay to them are included in the design. The blue roof will use a geocellular storage system to store rainwater and can then provide passive irrigation to the plants above.

Rain gardens have been included in the landscaping design to collect water from hard standing areas which can be used for plants that can withstand water logging. This helps with drainage, as well as providing plants that do not require irrigation.

Refer to the landscape plan and the Flood Risk Assessment & SuDs Strategy Report produced by others for further details.

3.2.4.3 Protecting Water Sources

The development is targeting the Man 03 Environmental Management BREEAM credit, in which all parties, who at any stage, manage the construction site will be required to implement best practice pollution prevention policies and procedures on site in accordance with Pollution Prevention Guidance 6 (PPG6).

The FRA and SuDS Strategy Report notes that there are no watercourses nearby of the site, and that all surface water run-off from roofs to the public sewer, is considered to be clean, and therefore no additional pollution mitigation is deemed necessary. In

addition, the site has no car park so contamination from substances such as petrol and oil are limited.

3.2.5 Pollution

3.2.5.1 Air Quality

Section 7.1 of the Sustainable Design & Construction document notes that an Air Quality Assessment (AQA) is required for major developments. As the new build extension to the Brunner House is only a minor development, an Air Quality Assessment is not necessary.

3.2.5.2 Noise

A Noise Impact Assessment has been prepared to inform the design. The development is also aiming to achieve the Pol 05 Reduction of Noise Pollution BREEAM credit which requires a Noise Impact Assessment compliant with BS 4142:2014 and for the noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, to be at least 5 dB lower than the background noise throughout the day and night. The credit also requires all mitigation measures to be incorporated into the design. The noise levels required for BREEAM are lower than those required to meet Policy D14 of the London Plan.

Refer to the Noise Impact Assessment produced by others for full details.

3.2.5.3 Light Pollution

The external lighting for the development will be designed to have limited light pollution from obtrusive light. The development is also aiming to achieve the Pol 04 Reduction of Night Time Light Pollution BREEAM credit which requires the external lighting strategy to be designed in compliance with the Institution of Light Professionals (ILP) Guidance notes for the reduction of obtrusive light (2021). It also requires the external lighting to be automatically switched off between the hours of 23:00-07:00.

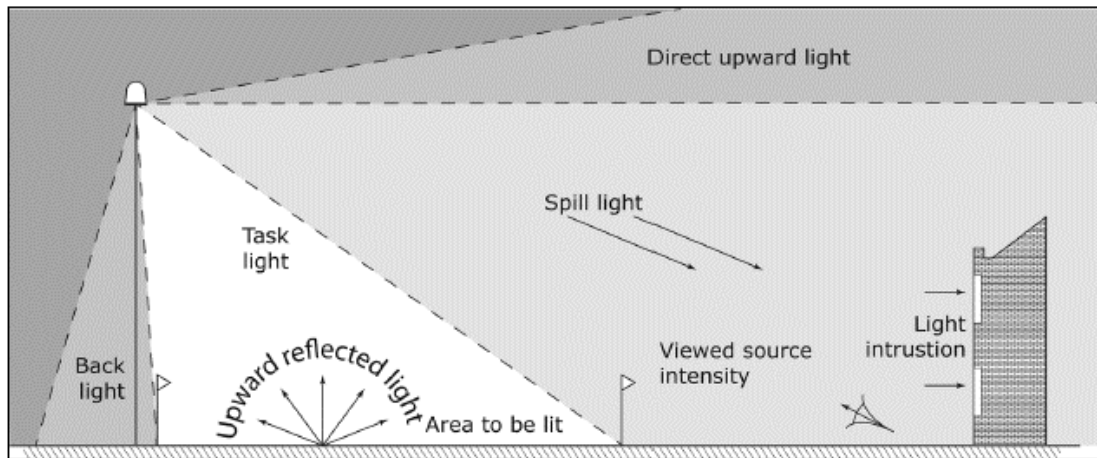


Figure 6: Types of Obtrusive Light (Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light (2021))

3.2.5.4 Contaminated Land

A Phase 1 Desk Study has been conducted which confirms the site may be contaminated, however the risk level classification is considered low to moderate. Further ground investigations will be undertaken to fully identify the risks from contamination and any remedial measures that may be required.

Refer to the Phase 1 Desk Study produced by others for full details.

3.2.5.5 Considerate Construction

The development is targeting the maximum number of BREEAM credits for the Man 03 Responsible Construction issue. This requires all parties, who at any stage, manage the construction site to have an Environmental Management System covering their main operations. This is typically ISO 14001 certification. The same parties will also be required to implement best practice pollution prevention policies and procedures on site in accordance with PPG6. The site will also be required to be registered with the Considerate Constructors Scheme (CCS) and is aiming to achieve a minimum score of 39 with 13 points in each section.

The Contractor will also be required to monitor all water, energy, waste and transport on site as part of the targeted BREEAM credits.

3.2.6 Waste

This theme focuses on reducing, re-using and recycling waste.

3.2.6.1 Waste Management

There will be a dedicated waste and recycling store in the landscaping design that is accessible and will comply with BREEAM, separate from the cycle area. The waste store will be labelled, to assist with segregation, storage and collection of the recyclable waste streams, accessible to building occupants or facilities operators, and of a capacity appropriate to the building type, size, and predicted volumes of waste that will arise from daily or weekly operational activities and occupancy rates.

3.2.6.2 Waste Hierarchy and Site Waste Management Plan

Some demolition will be required to facilitate the new building. A pre-demolition audit has been carried out to meet the BREEAM Wst 01 credit requirements. This will be used to determine the feasibility of re-use or recycling for any materials removed as a result of the works. Additionally, a compliant Site Waste Management Plan will be operated for the duration of site works for the main Contractor. This will include a target benchmark for resource efficiency, procedures and commitments to minimise hazardous and non-hazardous waste, including demolition and excavation waste. The current target is for the project to generate no more than 13.3m³ or 11.1 tonnes of waste per 100sqm gross internal floor area.

The development will also target 70% by volume or 80% by tonnage of waste to be diverted from landfill and either re-used or recycled.

3.2.7 Construction

3.2.7.1 Building Construction

The design is intended to be robust and durable, which reduces the need for replacement of materials during the building's life span. BREEAM credit Mat05 Designing for Durability is targeted.

3.2.7.2 Modern Methods of Construction (MMC)

The BREEAM credit Wst 06 Design for Disassembly and Adaptability is targeted, with measures for flexibility and adaptability being considered early on in the design. The Some examples of the measures considered have been included below:

- The design includes minimal internal walls so the spaces can be adapted for a range of functions within the need for structural alterations.

- The design includes no significant down beams which helps to provide flexibility of internal plant routes and partition arrangements.
- Reinforced concrete columns and timber columns will be used to accommodate additional loading from new floors. Consolidation of soils below the foundations can allow for an increase in the applied loading for future extensions.
- The façade is non-loadbearing and can be removed without affecting the main structural frame.

3.2.7.3 Low Impact Building Materials and Embodied Energy

The development has targeted BREEAM Mat01 by undertaking a BREEAM-compliant Life Cycle Assessment (LCA) using OneClick LCA software. The RIBA Stage 2 work is complete and submitted to BRE. This includes analysis of the superstructure, sub-structure and hard landscaping, and building services.

Results from the Concept Stage analysis are shown in the below graphs:

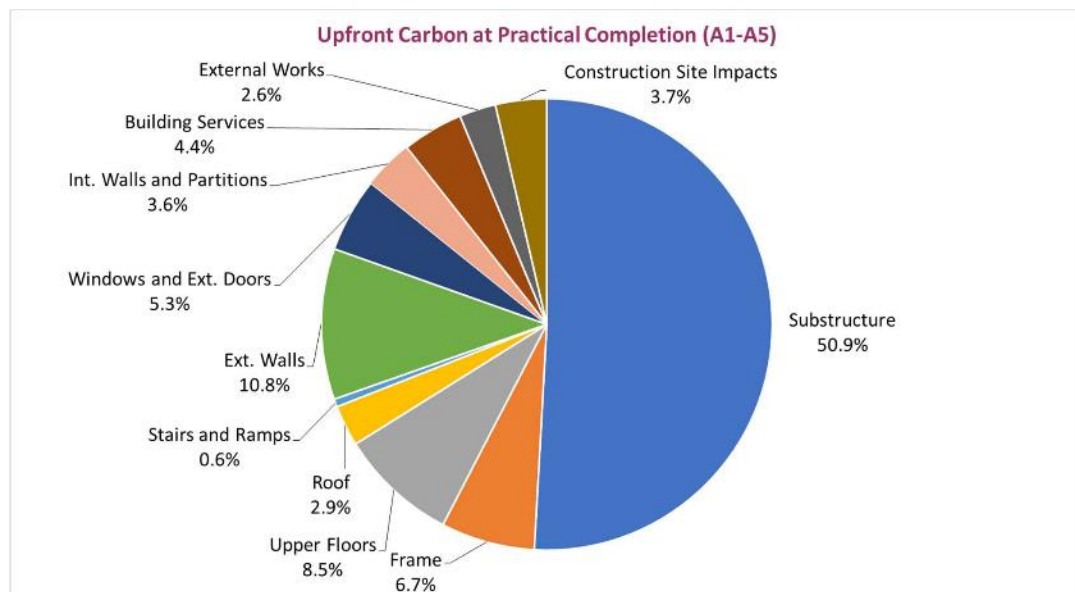


Figure 7: Upfront Carbon Concept Stage Results

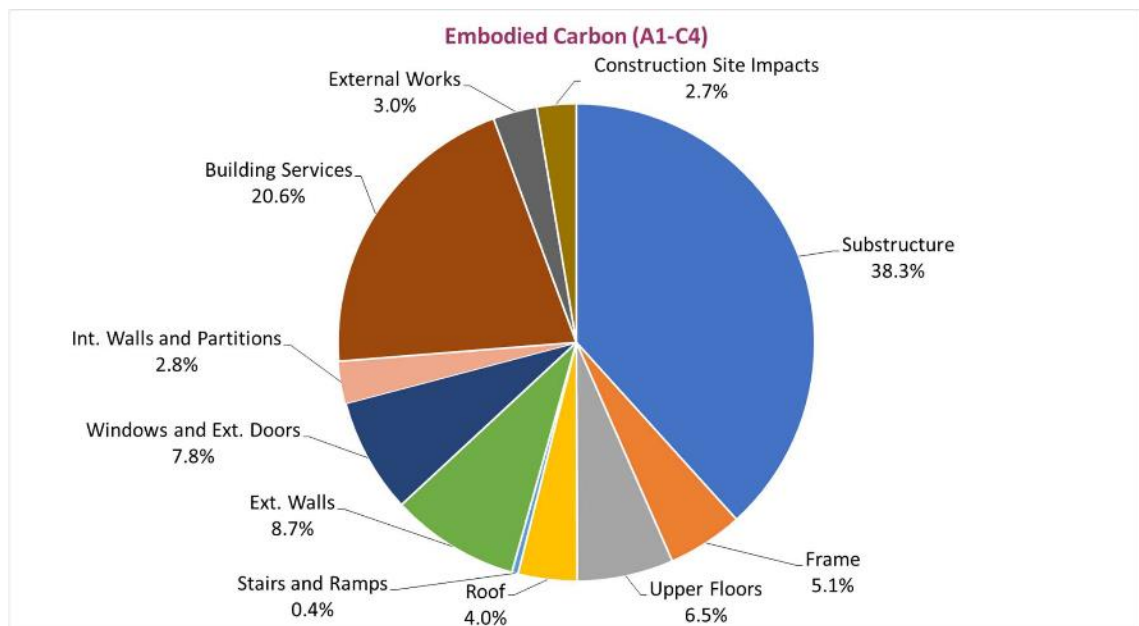


Figure 8: Embodied Carbon over 60 Years by Building Element Group (A1-C4)

Over two-thirds of the embodied carbon (A1-C4) emissions for this project are in the upfront carbon to Practical Completion (A1-A5) stages. As shown in Figure 7, the substructure is the largest contributor, however the external walls, upper floors and frame are all responsible for significant portions of the total upfront carbon. All of these elements are primarily made of concrete, a material with a high global warming potential (GWP), resulting in a high embodied carbon figure. If these elements were to be replaced with timber or high GGBS concrete, the upfront carbon and total embodied carbon of the project would likely decrease.

Figure 8 shows that building services play a much more significant role in the total embodied carbon (A1-C4) of a project, rather than in the upfront carbon (A1-A5), responsible for over 20% of the embodied carbon in this instance. Windows and doors are also significant when looking at the embodied carbon of this project, rather than the upfront carbon. Building services and windows have a higher replacement rate than other building elements and therefore have a larger impact in the 'in-use' stage (B1-B5) of the building life cycle, as can be seen in Figure 8. This shows the importance of efficient maintenance and durable equipment/materials.

Different options have been analysed to see how they impact upon the embodied carbon of the project and how much carbon they could save. A summary of these options is included in Table 1.

Table 1: Embodied Carbon Reduction Options

	Scenario / Building Category	Current Specification	Alternative Specification	Potential Savings (Kg CO ₂ eq.)	Potential Savings (Kg CO ₂ eq./m ²)
1	Superstructure	Flat roof for extension	Hybrid pitched/flat roof on extension	-11,465	-11
2		RC frame throughout, flat slab ground and upper floors and blockwork walls	RC frame beneath ribbed ground floor, timber frame & CLT upper floors	-9,434	-9
3			RC frame beneath ribbed ground floor, CLT walls and upper floors	-13,588	-14
4	Substructure	Raft foundation	Piles and pile cap foundations	-22,137	-22
5		20% GGBS in foundations	40% GGBS in foundations	-33,347	-33
6		Secant pile wall and liner	Sheet piled wall	+75,617	+76
7	Hard Landscaping (External Works)	Block paving	Grasscrete	-13,033	-13
8	Building Services	Air to air heating system	Ground source heat pump with radiators	-26,951	-27
9		Air to air heating system	Air to water heating system	-34,191	-34
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9				-123,394	-124
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9 (tonnes CO ₂ eq.)				-123	

An air to water heating system has been taken forward in the design, and the other options will be considered in the design with an update to the LCA modelling at the developed design stage (RIBA Stage 4) to capture any changes that have been made.

Refer to the Embodied Carbon report in Appendix B for further information.

3.2.7.4 Responsible Sourcing Certificates

A Sustainable Procurement Plan has been developed to guide the team as the project develops, including choosing products with responsible sourcing accreditation (such as ISO 14001, BES 6001, FSC, PEFC), and Environmental Product Declarations, where

possible. All timber used on the site will be required to be 'Legal' and 'Sustainable' as per the UK Government's Timber Procurement Policy (TPP).

3.2.8 Biodiversity

The development is targeting the BREEAM LE 02 Ecological Risks and Opportunities credits which require biodiversity to be considered at an early stage in the design process to identify to optimal ecological outcomes for the site.

The development is also targeting the BREEAM LE 03 Managing Impacts on Ecology credits which require planning to avoid and manage negative ecological impacts on-site. Two credits are targeted for LE 03 Managing Negative Impacts for no overall loss of ecological value.

The development is also aiming to achieve a net gain in biodiversity, demonstrated by the credits targeted for LE 04 Ecological Change and Enhancement and the biodiversity calculations provided by the Ecologist.

Refer to the Preliminary Ecological Appraisal and other ecology reports produced by others.

3.2.9 Transport

The extension will be small and accommodate existing students and staff at the school. Therefore, the development will not create increasing capacity for the transport network.

The site does not have any parking due to its small size and also to encourage the use of sustainable forms of transport. A minimum of 20 cycle storage spaces which will be covered, secure and lit according to BREEAM requirements will be provided, along with incentives, education and other measures to encourage walking, cycling and car sharing.

Refer to the Transport Assessment by others for further details, and the Travel Plan included in Appendix C.

4 Conclusion

This Sustainability Statement considers the Haringey Sustainable Design & Construction SPD to demonstrate how the proposed development follows relevant planning policy, including the London Plan, the Haringey Development Management DPD and the Haringey Strategic policies.

The development is on track to achieve a high BREEAM Very Good rating, in line with the planning policy. A BREEAM pre-assessment is included with the submission to show the targeted credits. The pre-assessment shows a current target of 69.25% which is high Very Good rating. The final credits will be subject to change as the design develops.

With a low energy design, consideration of sustainable construction materials, measures to minimise waste and water usage, and maximise ecology and biodiversity, this development seeks to comply with relevant policy .

5 Appendices

5.1 Appendix A – BREEAM Pre-Assessment Summary

Method Consulting

Intelligent engineering,
sustainable buildings

Channing School (Brunner House Redevelopment)

BREEAM New Construction V6
Education (Schools with Labs)

Design Stage Pre-Assessment Summary
For Planning

P01, December 2023

BREEAM Assessments • BREEAM AP • SKA • WELL • Post Occupancy Evaluation • IMPACT LCA • Energy and Sustainability Statements • Home Quality Mark • SAP & SBEM, EPCs • DREAM • Passivhaus



Channing School (Brunner House Redevelopment) BREEAM Pre-Assessment

Introduction

BREEAM, the UK's Building Research Establishment's Environmental Assessment Method, is used to rate the environmental performance of new or existing buildings, as designed and constructed and/or in operation. A BREEAM rating can be awarded where sufficient credits have been gained on the basis of meeting environmental performance criteria in each of the technical categories:

Rating levels
Pass - 30%
Good - 45%
Very Good - 55%
Excellent - 70%
Outstanding - 85%

BREEAM categories	
Management	Materials
Health & Wellbeing	Waste
Energy	Land Use & Ecology
Transport	Pollution
Water	Innovation

This pre-assessment has been carried out based on the BREEAM New Construction V6 Design Stage Criteria. This scheme is applicable to new build non-domestic projects. In addition to a range of standard issues assessed for all building types, this also includes requirements specific to Education (Schools with Labs) Buildings which have been included in this pre-assessment. The BREEAM Technical Manual should be referred to for full details of each credit.

Scoring and mandatory requirements

BREEAM requires the achievement of a minimum percentage score in order to achieve a particular rating. This is determined by a scoring system in which credits are assigned to issues under each of the sections above. These sections are each weighted differently so credits in different sections equate to a different percentage score to those in other sections. The percentage contribution of each section to the final score is noted at the end of each section in the following pages.

In addition to the achievement of a minimum score, BREEAM also contains mandatory credits/requirements which MUST be achieved in order to obtain a particular rating. If these are not achieved, the required rating cannot be obtained regardless of the percentage score achieved. In BREEAM V6, there are also 'pre-requisites' which do not carry a score, but must be achieved in order to award a credit and/or rating. Where a pre-requisite or mandatory credit is present, this is clearly noted in the summary below.

Project Targets

MINIMUM BREEAM RATING: Very Good (This equates to a score of 55% and requires the achievement of certain mandatory credits.)

It should be noted that until sufficient evidence is provided by the project team to the BREEAM Assessor to demonstrate that the full requirements have been met, none of these scores can be assumed to have been achieved, but remain as targets until the assessor confirms otherwise. This pre-assessment is based on discussions held during a BREEAM Pre-assessment workshop and additional correspondence with individual design team members.

The base target shows the minimum credits anticipated to be achieved for the development. This equals 69.25% which is a rating of Very Good.

Pre-assessment Results

Base Target (%)	69.25
-----------------	-------

	Credit Title	Credits Available	Base Target
	MANAGEMENT		
Man 01	Project Delivery Planning	1	1
	Stakeholder Consultation (Interested Parties)	1	0
	Pre-requisite (BREEAM AP) (Concept and Developed Design)	Y	Y
	BREEAM AP (Concept Design & Developed Design)	2	1
Man 02	Elemental Life Cycle Cost (LCC)	2	0
	Component Level LCC Options Appraisal	1	0
	Capital Cost Reporting	1	1
Man 03	Pre-requisite	Y	Y
	Environmental Management	1	1
	Pre-requisite (BREEAM AP Site)	Y	Y
	BREEAM AP (Site)	1	1
	Responsible Construction Management [Mandatory: 1 credit for Excellent; 2 credits for Outstanding]	2	2
Man 04	Monitoring of Construction Site Impacts (Utility Consumption & Transport)	2	2
	Commissioning - Testing Schedule and Responsibilities [Mandatory: 1 credit for Very Good, Excellent & Outstanding]	1	1
	Commissioning - Design and Preparation	1	1
	Testing and Inspecting Building Fabric	1	1
	Pre-requisite [Mandatory: Building User Guide for Very Good, Excellent & Outstanding]	Y	Y
Man 05	Handover	1	1
	Aftercare Support	1	1
	Commissioning - Implementation [Mandatory: 1 credit for Excellent & Outstanding]	1	1
	Post Occupancy Evaluation	1	1
Sub-total		21	16
Weighted sub-total (%)		11.00	8.38

	HEALTH AND WELLBEING		
Hea 01	Control of glare from sunlight	1	1
	Daylighting	2	0
	View Out	1	0
	Internal and External Lighting Levels, Zoning and Control	1	1
Hea 02	Indoor Air Quality Plan (Pre-requisite)	Y	Y
	Ventilation	1	1
	Emissions from Construction Products	2	0
Hea 04	Post-construction indoor air quality measurement	1	0
	Thermal Modelling	1	1
	Design for future thermal comfort	1	1
	Thermal Zoning and Controls	1	1
Hea 05	Acoustic Performance	3	3
Hea 06	Security of Site and Building	1	1
Hea 07	Safe Access	1	0
	Outside Space	1	1
Sub-total		18	11
Weighted sub-total (%)		14.00	8.56

	ENERGY		
Ene 01	Energy Performance [Mandatory: 4 credits for Excellent; 6 credits for Outstanding]	9	4
	Energy Modelling and Reporting [Mandatory: 4 credits for Outstanding]	4	0
Ene 02	Sub-metering of end-use categories [Mandatory: 1 credit for Very Good, Excellent & Outstanding]	1	1
	Sub-metering of high energy load and tenancy areas	1	1
Ene 03	External Lighting	1	1
Ene 04	Passive Design (Passive Design Analysis)	1	0
	Passive Design (Free Cooling)	1	0
	Low and Zero Carbon Technologies (LZC Feasibility Study)	1	1
Ene 06	Transport Systems: Energy Consumption	1	1
	Transport Systems: Energy Efficient Features	1	1
Ene 08	Energy Efficient Equipment	2	2
	Sub-total	23	12
	Weighted sub-total (%)	16.00	8.35

	TRANSPORT		
Tra 01	Travel Plan	2	2
Tra 02	Pre-requisite	Y	Y
	Transport Options Implementation	10	4
	Sub-total	12	6
	Weighted sub-total (%)	10.00	5.00

	WATER		
Wat 01	Water Consumption [Mandatory: 1 credit for Good, Very Good & Excellent; 2 credits for Outstanding]	5	3
Wat 02	Pre-requisite [Mandatory: Water meter on mains supply to each building for Good, Very Good, Excellent & Outstanding]	Y	Y
	Water Monitoring	1	1
Wat 03	Leak Detection System	1	1
	Flow Control Devices	1	1
Wat 04	Water Efficient Equipment	1	1
	Sub-total	9	7
	Weighted sub-total (%)	7.00	5.44

	MATERIALS		
Mat 01	Superstructure (Option appraisal during Concept / Technical Design)	6	6
	Substructure and hard landscaping options appraisal during Concept Design	1	1
Mat 02	Specification of products with a recognised Environmental Product Declaration (EPD)	1	1
Mat 03	Pre-requisite [Mandatory: All timber used on project is 'Legally harvested and traded timber' for ALL.]	Y	Y
	Enabling Sustainable Procurement	1	1
	Measuring Responsible Sourcing	3	1
Mat 05	Designing for Durability and Resilience	1	1
Mat 06	Material Efficiency	1	0
	Sub-total	14	11
	Weighted sub-total (%)	15.00	11.79

	WASTE		
Wst 01	Pre-demolition audit [Mandatory: 1 credit from total Wst 01 for Outstanding]	1	1
	Construction resource efficiency [Mandatory: 1 credit from total Wst 01 for Outstanding]	3	1
	Diversion of resources from landfill [Mandatory: 1 credit from total Wst 01 for Outstanding]	1	1
Wst 02	Pre-requisite	Y	Y
	Project Sustainable Aggregate Points	1	0
Wst 03	Operational Waste [Mandatory: 1 credit for Excellent and Outstanding]	1	1
Wst 05	Adaptation to Climate Change (Resilience of structure, fabric, building services and renewables installation)	1	0
Wst 06	Design for disassembly and functional adaptability - recommendations	1	0
	Disassembly and functional adaptability – implementation	1	0
		Sub-total	10
		Weighted sub-total (%)	6.00
			4
			2.40

	LAND USE & ECOLOGY		
LE 01	Previously Occupied Land	1	0
	Contaminated Land	1	0
LE 02	Pre-requisite (Statutory obligations)	Y	Y
	Survey and evaluation	1	1
	Determining ecological outcomes	1	1
LE 03	Pre-requisite (Ecological risks and opportunities)	Y	Y
	Planning and measures on-site	1	1
	Managing negative impacts	2	2
LE 04	Pre-requisite (Managing negative impacts)	Y	Y
	Ecological enhancement	1	1
	Change and enhancement of ecology	3	2
LE 05	Pre-requisite (Statutory obligations, planning and site implementation)	Y	Y
	Management and maintenance throughout the project	1	1
	Landscape and ecology management plan	1	1
		Sub-total	13
		Weighted sub-total (%)	13.00
			10
			10.00

	POLLUTION		
Pol 01	Impact of Refrigerants: Pre-requisite	Y	Y
	Impact of Refrigerants	3	1
Pol 02	Local Air Quality	2	2
	Pre-requisite	Y	Y
Pol 03	Flood Resilience	2	2
	Surface Water Run Off: Pre-requisite	Y	Y
	Surface Water Run Off	2	1
	Minimising Watercourse Pollution	1	0
Pol 04	Reduction of Night Time Light Pollution	1	1
Pol 05	Reduction of Noise Pollution	1	1
		Sub-total	12
		Weighted sub-total (%)	8.00
			8
			5.33

INNOVATION		
Man 03: Responsible Construction Practices	1	1
Hea 01: Visual Comfort	2	1
Hea 02: Indoor Air Quality	1	0
Hea 06: Security	1	0
Ene 01: Reduction of Energy Use and Carbon Emissions	5	0
Wat 01: Water Consumption	1	0
Mat 01: Environmental Impacts - Building LCA	3	2
Mat 03: Responsible Sourcing of Construction Products	1	0
Wst 01: Construction Waste Management	1	0
Wst 02: Use of Recycled and Sustainably Sourced Aggregates	1	0
Wst 05: Adaptation to Climate Change	1	0
LE 02: Wider site sustainability	1	0
LE 04: Change and enhancement of ecological value	1	0
Inn 01: Special Innovative Feature	10	0
Sub-total	10	4
Weighted sub-total (%)	10.00	4.00

Base Target (%)	69.25
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13/12/2023 linked to Rev P2

5.2 Appendix B – BREEAM V6 Mat 01 Embodied Carbon Report (Concept Design)

Method Consulting

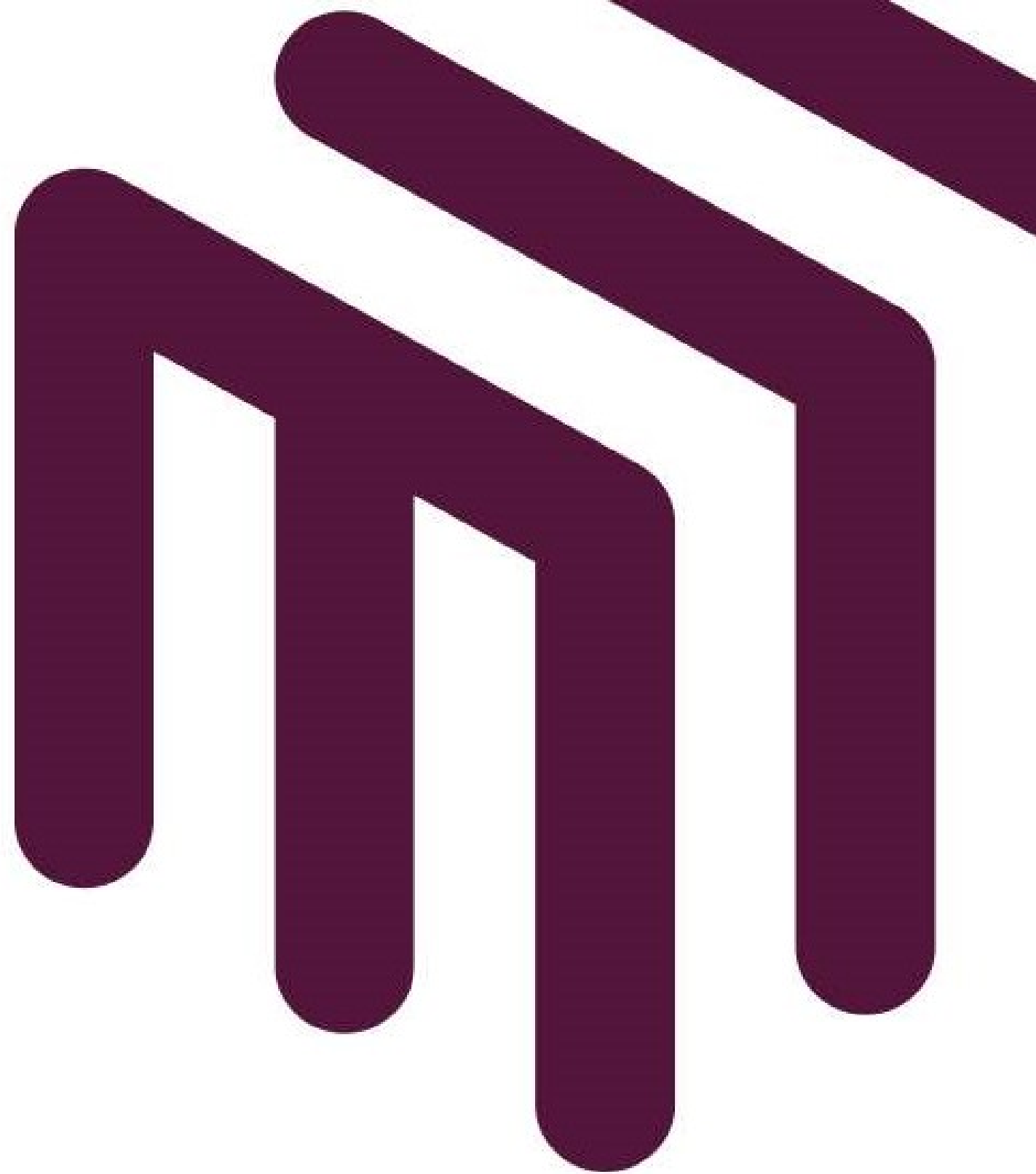
Intelligent engineering,
sustainable buildings

Brunner House Redevelopment

BREEAM V6 Mat 01 Embodied Carbon Report (Concept Design)

For Channing School

September 2023



Document History

This document has been revised and issued as below:

Revision	Date	Description	Created by	Approved by
P01	22/09/2023	First Issue	GHB	TWL

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1 Executive Summary

Method Consulting has been appointed on behalf of Channing School, to conduct a life-cycle assessment study for embodied carbon emissions (measured in carbon dioxide equivalents, kgCO₂e) of the Brunner House Redevelopment in Haringey, London. The project is an extension and refurbishment of the existing Brunner House building with the aim to provide new science and design and technology (DT) facilities.

This report quantifies the embodied carbon of this project at RIBA Construction Stage 2. It should be noted that this report currently includes the results of materials entered for the BREEAM V6 scope at Concept Design (RIBA Construction Stage 2), and that Operational Energy (B6) and Operational Water (B7) are not included, as they are outside the scope of this assessment. This report will be updated and re-issued at the end of Technical Design (RIBA Construction Stage 4) to include any changes that may have taken place to the superstructure following design development. The embodied carbon figures noted within this report for the superstructure are, therefore, subject to change.

Carbon reduction options have been run for the superstructure, substructure, hard landscaping (external works), and building services. A summary of the results of the embodied carbon analysis, split by building element, is presented below:

Embodied Carbon Over Life Cycle (tonnes CO ₂ e)		Upfront Carbon at Practical Completion (A1-A5)	Embodied Carbon (A1-C4)	Embodied Carbon (A1-C4) %
Substructure		200	207	38
Superstructure	Frame	26	28	5.1
	Upper Floors	33	35	6.5
	Roof	12	22	4.0
	Stairs and Ramps	2.2	2.3	0.42
	External Walls	42	47	8.7
	Windows and External Doors	21	42	7.8
	Internal Walls and Partitions	14	15	2.8
Building Services		17	111	21
External Works		10	16	3.0
Construction Site Impacts		14	14	2.7
Total Embodied Carbon (kg CO₂e)		392,625	540,305	
Total Embodied Carbon (tonnes CO₂e)		393	540	
Embodied Carbon Intensity (kg CO₂ / m² GIA)		394	542	

Table 1: Embodied Carbon Results by Building Element: To Practical Completion and Total Embodied Carbon

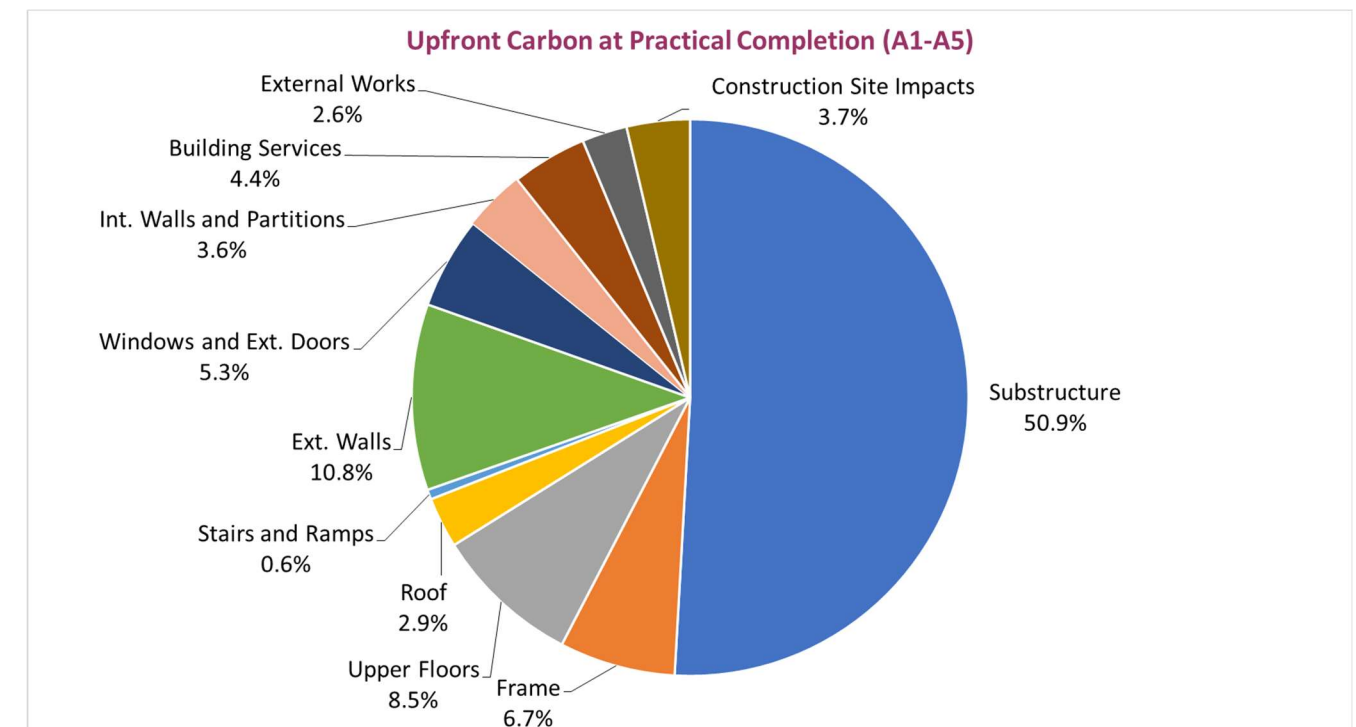


Figure 1: Upfront Carbon at Practical Completion by Building Element Group (A1 - A5).

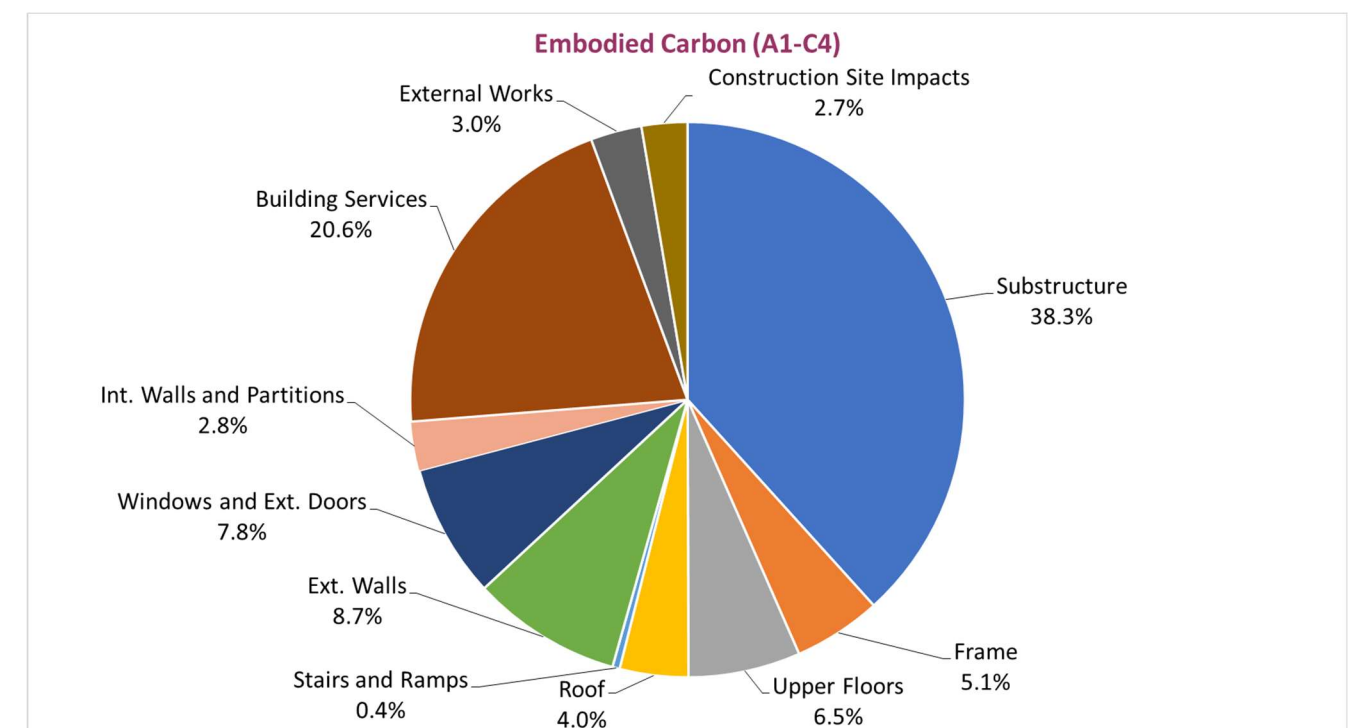


Figure 2: Embodied Carbon Over 60 Years by Building Element Group (A1 - C4)

This analysis (to the BREEAM V6 scope) has shown that the upfront carbon to practical completion (A1-A5) figure for this building is 393 tonnes CO₂e. This analysis has also shown that the embodied carbon (A1-C4) figure (to the BREEAM V6 scope) for this building is 540 tonnes CO₂e. Carbon reduction options have been run for the superstructure, substructure, hard landscaping (external works) and building services, where a summary of the results is detailed below.

	Scenario / Building Category	Current Specification	Alternative Specification	Potential Savings (Kg CO ₂ eq.)	Potential Savings (Kg CO ₂ eq./m ²)
1	Superstructure	Flat Roof	Hybrid Pitched/Flat Roof	-11,465	-11
2		RC Frame throughout, flat slab ground and upper floors and Blockwork walls	RC frame beneath ribbed ground floor, timber frame & CLT upper floors	-9,434	-9
3			RC frame beneath ribbed ground floor, CLT walls and upper floors	-13,588	-14
4	Substructure	Raft foundation	Piles and Pile cap foundations	-22,137	-22
5		20% GGBS in foundations	40% GGBS in foundations	-33,347	-33
6		Secant Pile Wall and Liner	Sheet Piled Wall	+75,617	+76
7	Hard Landscaping (External Works)	Block Paving	Grasscrete	-13,033	-13
8	Building Services	Air to Air Heating System	Ground Source Heat Pump with Radiators	-26,951	-27
9		Air to Air Heating System	Air to Water Heating System	-34,191	-34
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9				-123,394	-124
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9 (tonnes CO ₂ eq.)				-123	

Table 2: Embodied Carbon Reduction Options

The design team have discussed the options modelled and provided justifications for their inclusion or exclusion from the design. Following these discussions, the results of the modelling have been downloaded from the modelling software and the BREEAM Mat 01/02 Results Submission Tool has been submitted. This has now been uploaded by the BREEAM Assessor to the relevant portal.

It is intended for elements of this report, if appointed, to be updated at Stage 4 in-line with BREEAM V6 methodology. The upfront carbon and embodied carbon figures noted within this report are, therefore, subject to change.

Comparisons with industry benchmarks can be seen in Section 8. Please note, these targets are for the full embodied carbon scope as outlined by RICS, whereas this report is to the BREEAM V6 scope, which excludes several elements. These comparisons have, therefore, been included for reference only.

2 Introduction

Method Consulting has been appointed on behalf of Channing School, to conduct a life-cycle assessment study of embodied carbon emissions (measured in carbon dioxide equivalents, kgCO₂e) of the Brunner House Redevelopment in Haringey, London. The project is an extension to and refurbishment of the existing Brunner House building with the aim to provide new science and DT facilities.

This report will be used to quantify the embodied carbon (BREEAM V6 scope) of this project, which has a Gross Internal Area (GIA) of 997.12m². As can be seen from Figures 3-5 this is an extension and refurbishment project with much of the existing building being retained and an extension being added on.

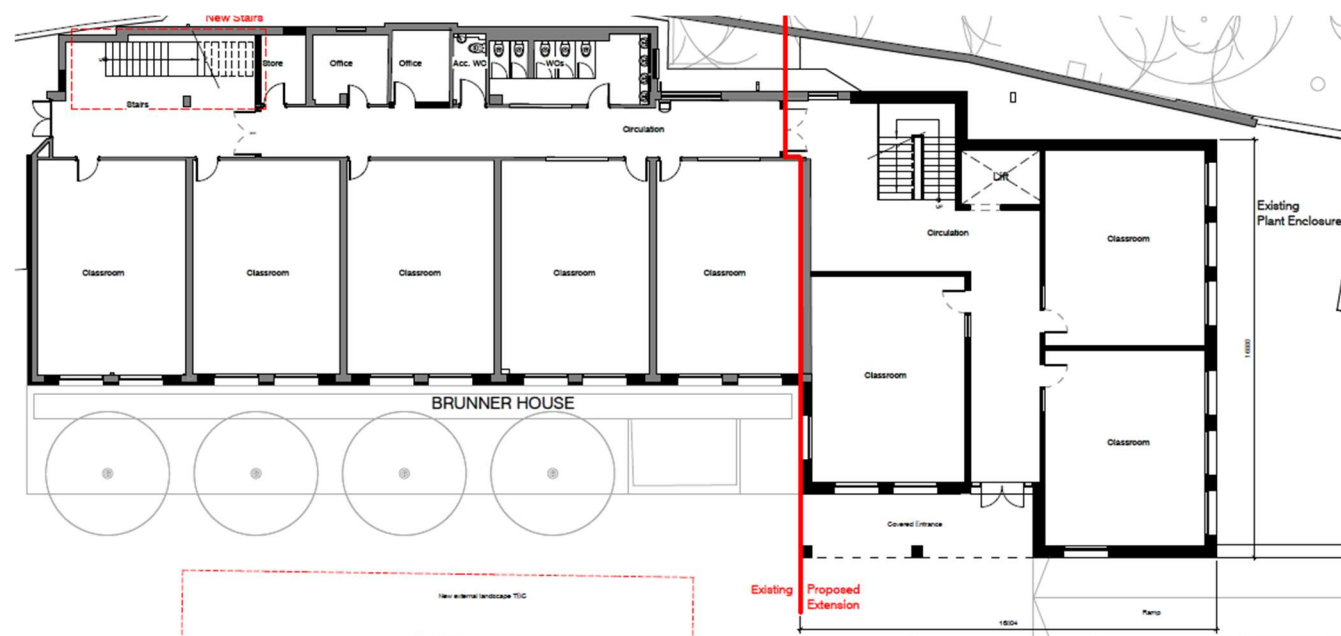


Figure 3: Proposed ground floor plan (NVB, "CHS-NVB-BRU-00-D-A-2101-P01-S2-Proposed Brunner House Ground Floor Plan")

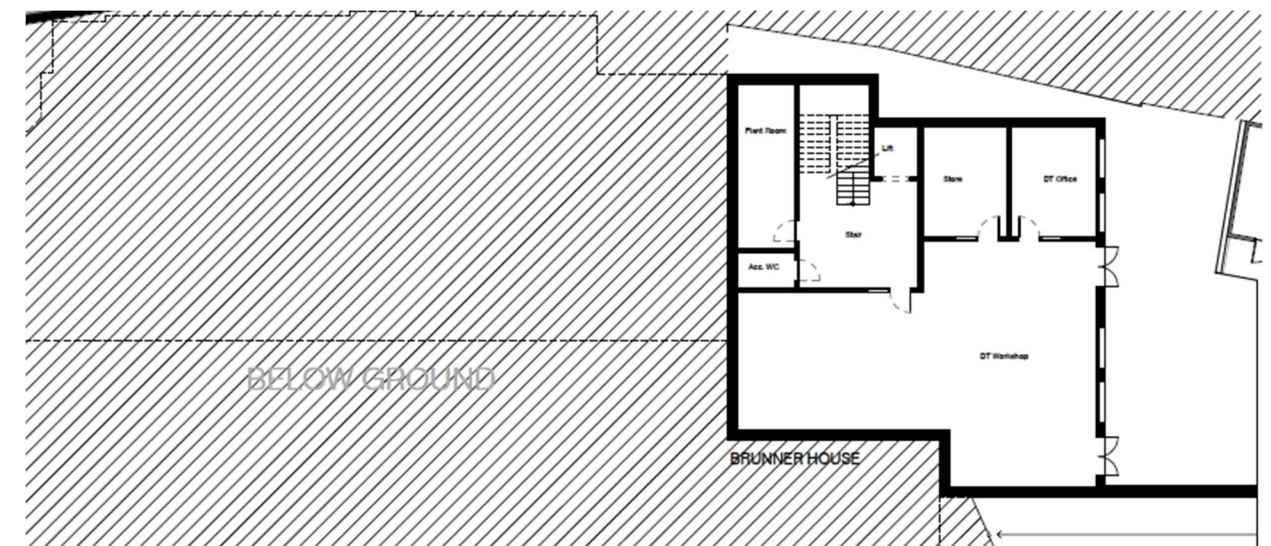


Figure 4: Proposed Basement Plan (NVB, "CHS-NVB-BRU-B1-D-A-2100-P01-S2-Proposed Brunner House Basement Plan")

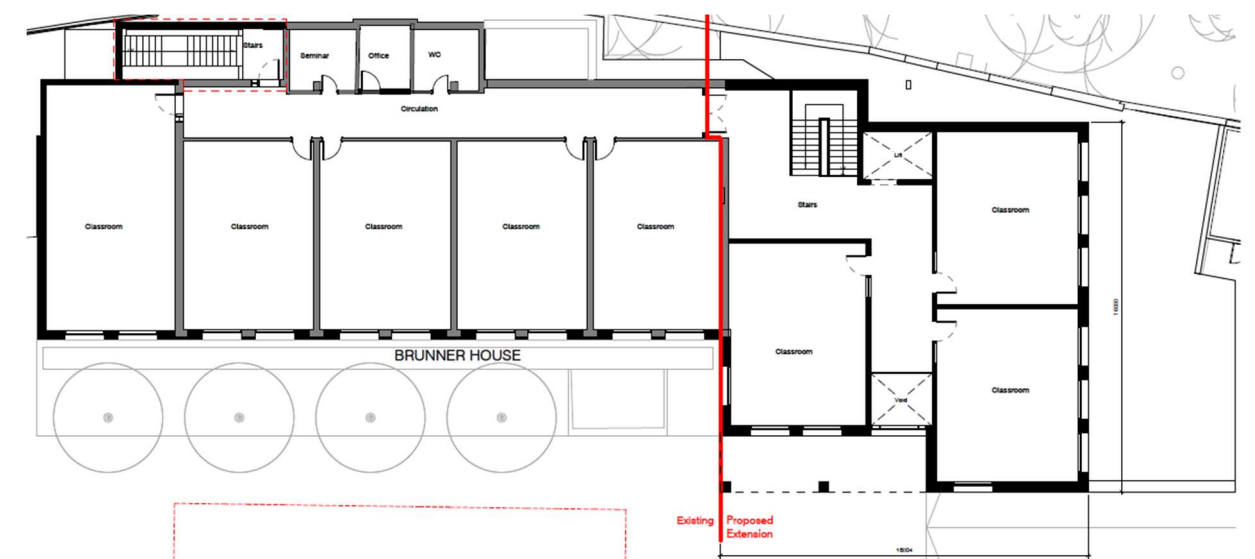


Figure 5: Proposed First Floor Plan (NVB, "CHS-NVB-BRU-01-D-A-2102-P01-S2-Proposed Brunner House First Floor Plan")

2.1 Background

Climate change is considered one of the greatest environmental challenges and is expected to have major implications for society. With carbon dioxide (CO₂) emissions being a significant cause of climate change, there has been a recent surge in momentum to attain the goal of *zero carbon* at country, industry, and company level.

The United Kingdom (UK) Green Building Council (UKGBC) estimates that the embodied carbon from construction could account for up to half of a new building's total life-cycle carbon impacts. Therefore, it is important to consider the whole life carbon impacts (both operational carbon emissions for the building during use, and embodied carbon from construction) when designing a building.

The Whole Life Carbon Network (WLCN) and Low Energy Transformation Initiative (LETI) define a net-zero carbon building as one where the sum of all building-related carbon emissions, both operational and embodied over a building's life cycle, are minimised in line with applicable industry targets, and with residual *offsets*, equate to zero.

Embodied carbon can be assessed through life-cycle analysis, which in this context, consists of modelling materials and quantity data from a verified database of construction materials, which quantifies associated environmental impacts through the use of Environmental Product Declarations. These results allow the environmental impact of a building to be analysed over its life cycle, as standard set as 60 years, which in-turn permits us to make recommendations as how to lower a building's embodied carbon, and subsequently, environmental impact.

2.2 Achieving Net Zero Carbon

UKGBC defines net-zero carbon for construction as being achieved when the carbon emissions for the building's product and construction stages (up to practical completion) are zero. Buildings targeting net-zero carbon for construction are recommended to be designed to achieve net-zero carbon for operational energy, with reductions in energy demand and consumption prioritised.

UKGBC set out the following steps for achieving a net zero carbon building:

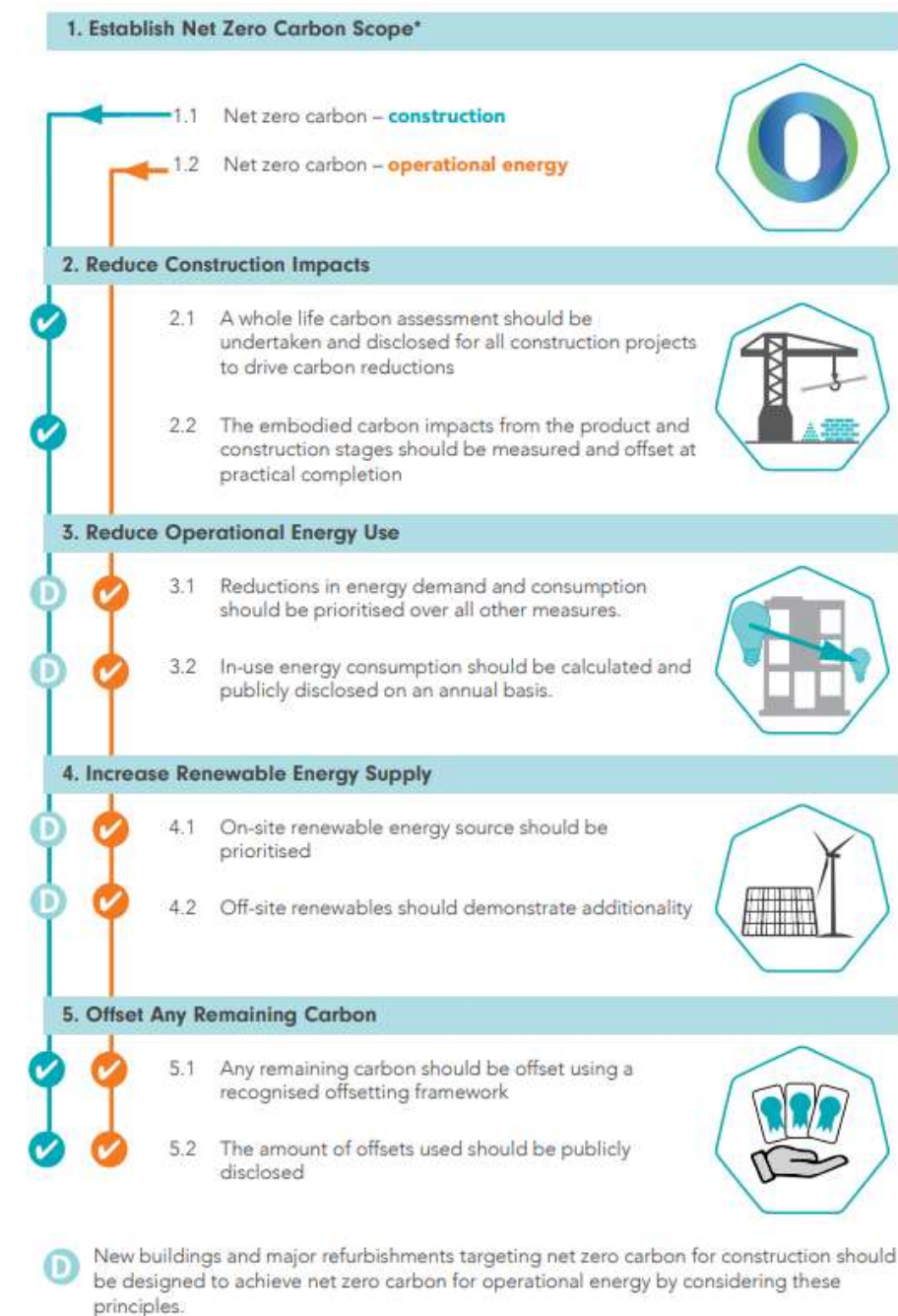


Figure 6: Steps to Achieving Net-Zero Carbon
from "Net-Zero Carbon Buildings: A Framework Definition" (UKGBC, 2019)

This analysis falls within Step 2 of this process by quantifying the current embodied carbon impacts of this project.

In working towards whole life net-zero carbon design, LETI sets out a series of best practice embodied carbon targets to be met at different points in time as the UK transitions to net-zero.

RIBA's 2030 Climate Challenge also sets embodied carbon targets, with both RIBA and LETI targets discussed further in Section 8.

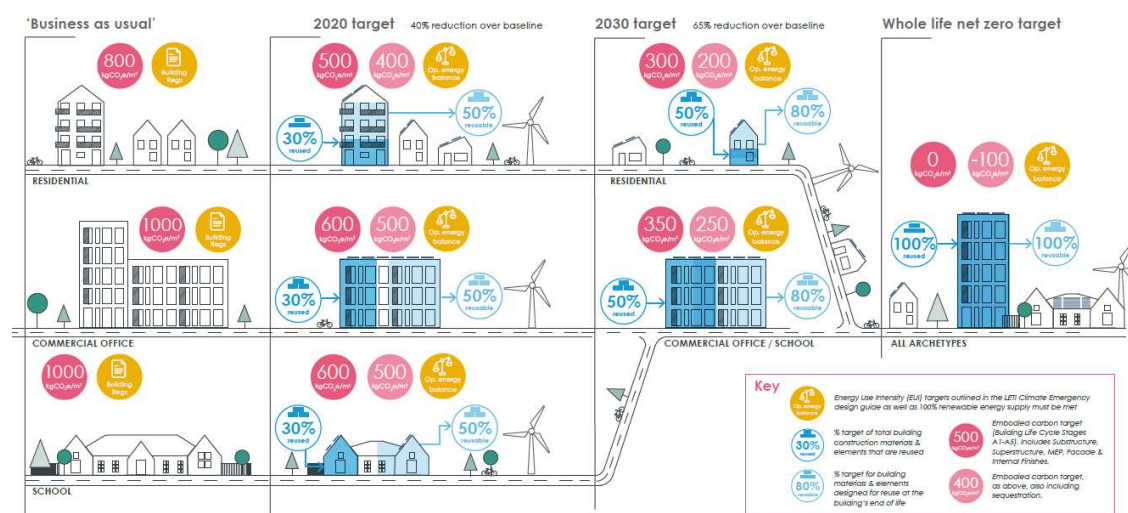


Figure 7: Targets for Achieving Net-Zero Carbon from "Embodied Carbon Primer" (LETI, 2019)

LETI also defines some key principles in terms of reducing Embodied Carbon impacts. These are helpful to consider in terms of framing this report and when looking at next steps.

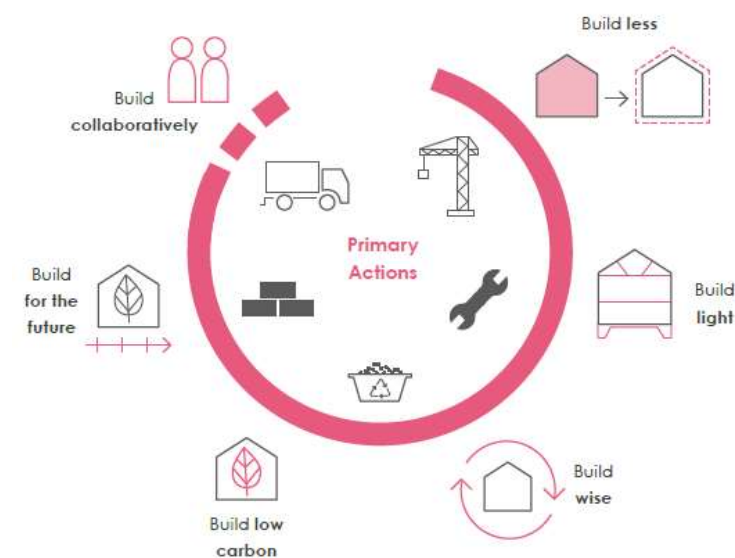


Figure 8: Principles to Reduce Embodied Carbon from "Embodied Carbon Primer" (LETI, 2019)

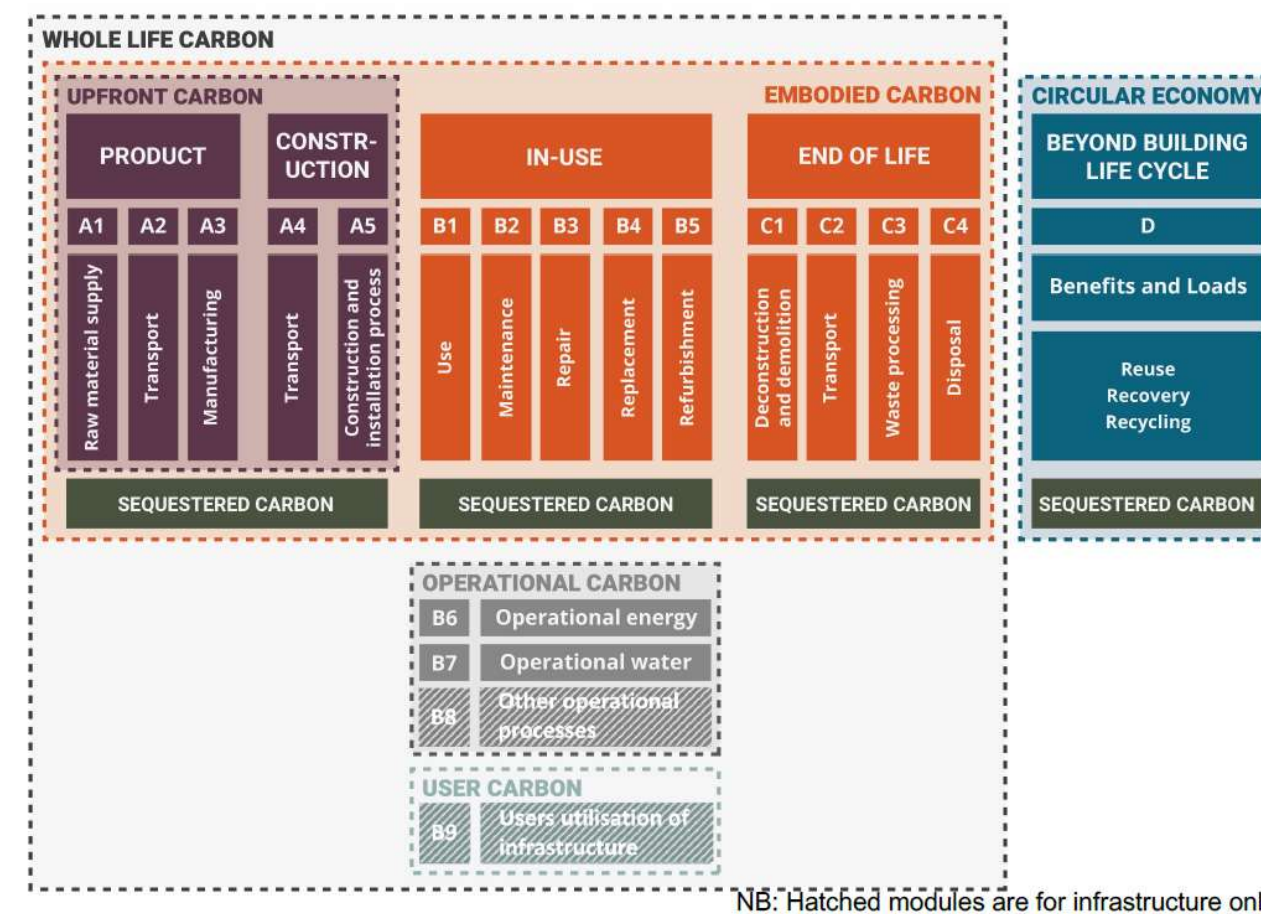
Whilst the purpose of this report is to quantify the current embodied carbon emissions of this project for the BREEAM V6 Mat 01 credit, UKGBC and LETI guidance documents provide the background and framework for the analysis.

3 Defining the Scope

When conducting embodied carbon modelling, it is important to define the boundaries and scope of what will be modelled in terms of building elements and life-cycle stages.

3.1 Life-Cycle Stages

LCA modelling has the potential to model all life-cycle stages from raw material extraction through to building end-of-life. These life-cycle stages are defined in modules.



Reference Diagram showing the Life Cycle Modules adapted from BS EN 15978 and PAS2080 (for Infrastructure). It shows the modules used in assessing all carbon emissions over an asset's entire lifecycle and the various terms that are used.

Figure 9: Life-Cycle Assessment Stages and Modules

from "Carbon Definitions for the Built Environment, Buildings, and Infrastructure" (WCLN, 2021)

The Royal Institution of Chartered Surveyors (RICS) has published guidance for conducting LCA modelling to standardise it within the industry. RICS' Whole Life Carbon Assessment (2017)

professional statement sets out the minimum module scope for a whole life carbon assessment as follows:

- Modules A1-A3: Product Stages
- Modules A4-A5: Construction Stages
- Module B4: Replacement of the Façade (over a 60-year lifespan)
- Module B6: Operational Energy

This aligns with the LETI definition of net-zero carbon in terms of considering upfront embodied carbon (Modules A1-A5) emissions which takes you up to practical completion, and the UKGBC Net-Zero Carbon Framework which defines net-zero carbon for Construction (Modules A1-A5) and Operational Energy (Module B6).

Modules B and C in the past were typically not included as part of defining net-zero carbon achievement due to a lack of robust data in the industry. This is because they are harder to measure and predict, particularly in the case of end-of-life impacts as these will depend on final disposal routes chosen decades in the future. These modules are now included in many reports, however, as more data becomes available.

UKGBC is also developing a whole life net-zero carbon definition, to encourage designing for deconstruction and a circular economy, and to require reporting of embodied carbon from maintenance, repair, refurbishment, and end-of-life stages. It should be noted that the figures from Modules B and C that have been included within the embodied carbon results and are reported using assumptions and default data from the carbon database used.

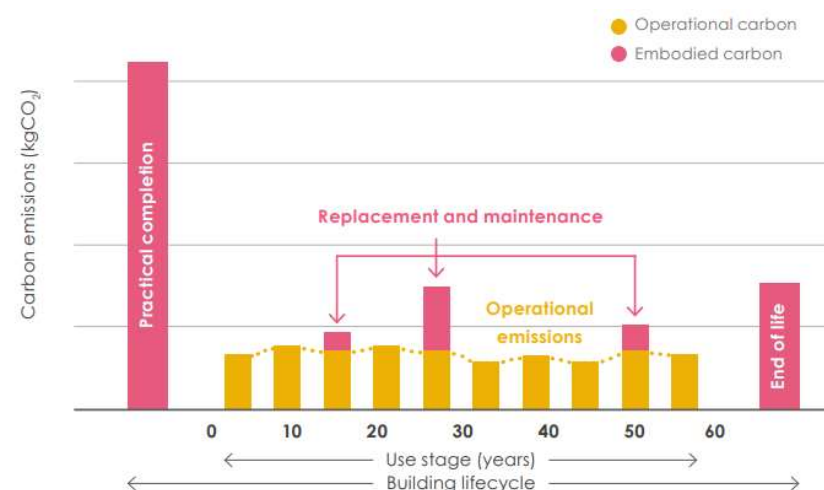


Figure 10: Breakdown of Carbon Emissions over a Building's Life-Cycle from "Embodied Carbon Primer" (LETI, 2019)

This assessment reports the upfront carbon to Practical Completion (Modules A1-A5) emissions in-line with LETI guidance, and the embodied carbon (Modules A1-C4) emissions, in line with the Royal Institute of British Architects (RIBA) 2030 Climate Challenge, following the BREEAM V6 scope. Operational Energy (Module B6) and Operational Water (Module B7) are not considered in this report.

3.2 BREEAM V6 Scope

Under the BREEAM New Construction V6 scheme, up to 7 Standard Mat 01 BREEAM credits are achievable where IMPACT compliant software is used to measure the environmental impact of the building and a benefit from the analysis is demonstrated.

Aim To reduce the burden on the environment from construction products by recognising and encouraging measures to optimise construction product consumption efficiency and the selection of products with a low environmental impact (including embodied carbon), over the life cycle of the building.
Value • Help project teams to understand the overall environmental impact of the building design. • Ensure that all life cycle greenhouse gas emissions are taken into account in the design, not just operational emissions. • Reduce the impact of the construction industry and construction product industries. • Assess the environmental impacts at the building level to provide flexibility when specifying construction products, to take into account project-specific conditions and priorities. • Allow optimal solutions to be identified and adopted to reduce overall environmental impacts arising from construction product use.

Figure 11: Mat 01 Credit Aims and Values from the BREEAM UK New Construction V6 Manual

Credits are awarded in BREEAM for carrying out an options analysis for:

- Superstructure (Up to 6 Credits)
 - For office, retail, and industrial buildings, a comparison with the BREEAM LCA benchmark must be undertaken.
- Substructure and Hard Landscaping (External Works) (1 Credit Available)
- Building Services (1 Exemplary Credit Available)

Two further exemplary credits are available. One credit is available for third-party verification of the LCA model, and the second credit is available where the LCA modelling is aligned with the Life Cycle Cost (LCC) reports for Man 02 (where targeted). Smaller fixtures and fittings (e.g., handrails, cubicles etc.) and all furniture, equipment and finishes are excluded from the LCA in accordance with the BREEAM scope. The study period for the LCA is taken as 60 years as required by BRE.

The BREEAM V6 scope includes the following:

Level 2 Element	Level 3 Sub-element
1. Frame	1. Steel frames 2. Space decks 3. Concrete casings to steel frames 4. Concrete frames 5. Timber frames 6. Other frame systems
2. Upper floors	1. Floors
3. Roof	1. Roof structure 2. Roof coverings 3. Specialist roof systems 5. Rooflights, skylights and openings
4. Stairs and ramps	1. Stair or ramp structures
5. External walls	1. External enclosing walls above ground floor level 2. External enclosing walls below ground level 3. Solar or rain screening
6. Windows and external doors	1. External windows
7. Internal Walls and Partitions	1. Walls and partitions (Education only)

Level 2 Element	Level 3 Sub-element
1. Substructure	1. Standard foundations 2. Specialist foundation systems 3. Lowest floor construction 4. Basement excavation 5. Basement retaining walls
2. Roads, paths and pavings	1. Roads, paths and pavings 2. Special surfacings and pavings

Level 2 Element	Level 3 Sub-element
5. Heat source	1. Heat source
6. Space heating and Air-conditioning	1. Central heating 2. Local heating 3. Central cooling 4. Local cooling 5. Central heating and cooling 6. Local heating and cooling 7. Central air- conditioning 8. Local air-conditioning
7. Ventilation	1. Central ventilation 2. Local ventilation 3. Smoke extract or control
9. Fuel installations and systems	1. Fuel storage 2. Fuel distribution systems

Figure 12: Extracts from the BREEAM UK New Construction V6 Manual Noting the Scope of Materials for the Mat 01 Credit Section

BREEAM V6 requires modelling to be completed and uploaded to the BRE within Stage 2. The model should include all elements listed in the figure above, depending on the credits targeted. An update to the model should also be completed in Stage 4 for the superstructure elements.

3.3 Methodology

This assessment has been conducted with reference to RICS' Whole Life Carbon Assessment for the Built Environment (2017) professional statement which outlines a methodology for conducting embodied carbon assessments. Table 3 notes the building elements included within the scope of this report, following the building elements table (see Appendix 10.1). The scope of this report has been defined in this table following BREEAM V6 methodology noted in Section 3.2.

The scope of this report follows the BREEAM methodology, which includes superstructure, substructure, and external works and building services. RICS defines the minimum building element scope for LCA as substructure and superstructure. To provide a more complete picture of a building's embodied carbon, it is recommended that this scope is expanded to include building services, internal finishes, and hard landscaping (external works). It should be noted that internal finishes are excluded from the scope of assessment if solely following the BREEAM V6 methodology.

	Building Part / Element Group	Building Element	Included Within Scope of Study
	Demolition	0.1 Toxic / Hazardous / Contaminated Material Treatment	No
		0.2 Major Demolition Works	No
0	Facilitating Works	0.3 & 0.5 Temporary / Enabling Works	No
		0.4 Specialist Groundworks	No
1	Substructure	1.1 Substructure	Yes
2	Superstructure	2.1 Frame	Yes
		2.2 Upper Floors	Yes
		2.3 Roof	Yes
		2.4 Stairs and Ramps	Yes
2	Superstructure	2.5 External Walls	Yes
		2.6 Windows and External Doors	Yes
2	Superstructure	2.7 Internal Walls and Partitions	Yes
		2.8 Internal Doors	No
3	Finishes	3.1 Wall Finishes	No
		3.2 Floor Finishes	No
		3.3 Ceiling Finishes	No
4	Fittings, Furnishings and Equipment (FF&E)	4.1 Fittings, Furnishings, and Equipment (Building and Non-Building Related)	No
5	Building Services (M&E)	5.1-5.14 Services (Building and Non-Building Related)	Yes
6	Prefabricated Buildings and Building Units	6.1 Prefabricated Buildings and Building Units	N/A
7	Work to Existing Building	7.1 Minor Demolition and Alteration Works	No
8	External Works	8.1 Site Preparation Works	No
		8.2 Roads, Paths, Pavings, and Surfacing	Yes
		8.3 Soft Landscaping, Planting, and Irrigation Systems	No
		8.4 Fencing, Railings and Walls	No
		8.5 External Fixtures	No
		8.6 External Drainage	No
		8.7 External Services	No
		8.8 Minor Building Works and Ancillary Buildings	No

Table 3: Building Elements Included Within the Scope of this Embodied Carbon Study.

The analysis was conducted using LCA software OneClick LCA. OneClick LCA is a dedicated life-cycle assessment (LCA) tool, which allows the embodied CO₂ eq. impacts for all the specified materials to be modelled using the One Click LCA “LCA For BREEAM UK” database, which is integrated into the software. The study period for the LCA is taken as 60 years as required by RICS and the BRE. Where available, Environmental Product Declarations (EPDs) have been used for specific products. Where product specific EPDs are not available in the database, or where the material manufacturer and product types are not currently known, the closest matching product has been selected. This is either a generic material based on average industry data or the closest matching EPD for a similar product.

The software includes for material manufacturing localisation (also known as local compensation), and this is used to overcome the problem where local environmental profiles from different countries are not available. Products selected within the model that are manufactured outside of the UK will, therefore, automatically have their manufacturing electricity adjusted to the UK’s electricity grid profile. Default data has also been used for construction figures, which includes for construction electricity and fuel use, along with waste and transportation impacts. The upfront carbon and embodied carbon figures within this report are, therefore, subject to change. There is potential to update the report at the end of the project once the Contractor has provided further information on the final materials and quantities used, as well as the site data noted above, allowing localisation to be switched off.

It should be noted that for full embodied carbon scope projects biogenic carbon is included within the embodied carbon (A1-C4) figures, in line with current guidance, but is not accounted for within the upfront carbon at Practical Completion (A1-A5), the in-use embodied carbon (B1-B5) or the End-of-Life (C1-C4) figures. For BREEAM projects the modelling software does not account for biogenic carbon and therefore, this figure is reported separately.

Quantity and material data were sourced from the design team via completed Request for Information (RFI) schedules provided by Method Consulting. Emails and phone calls have also taken place where required to obtain clarification on any elements where further information was required to model the element(s) in question. Drawings and specifications have also been provided by the design team.

Actions to be completed at Stage 4:

- RFI forms to be reissued to the design team to capture any changes to the superstructure.
- Superstructure model to be updated.
- Additional superstructure options appraisals to be modelled and discussed with the design team.

3.4 Environmental Product Declarations (EPDs)

As previously noted, where possible, EPDs have been used for specific products that are available within the software. Where product specific EPDs are not available in the database, or where the material manufacturer and product types are not currently known, the closest matching product has been selected. This is either a generic material based on average industry data or the closest matching EPD for a similar product.

It is worth noting that data from EPDs should not solely be used to make assumptions of comparisons on embodied carbon for the project, as some EPDs only report data for the Product (A1-A3) Stage and, therefore, do not include for the Construction (A4-A5) stage, the In-Use (B1-B5) stage which includes replacement of products, or the End-of-Life (C1-C4) stage.

4 Results (Stage 2 – Concept Design)

The table below details the embodied carbon results for this new-build project, broken down by life-cycle stage and over the whole life-cycle period of 60 years. The embodied carbon (A1-C4) is **540 tonnes CO₂e** (**542 kg CO₂e/m² GIA**) of which the upfront carbon at Practical Completion (A1-A5) stage is **393 tonnes CO₂e** (**394 kg CO₂e/m² GIA**).

Embodied Carbon Over Life Cycle (kg CO ₂ e)		Upfront Carbon at Practical Completion (A1-A5)	In-Use (B1-B5)	End-of-Life (C1-C4)	Embodied Carbon (A1-C4)
Substructure		200	0	7.0	207
Superstructure	Frame	26	0	1.3	28
	Upper Floors	33	0	2.0	35
	Roof	12	6.6	3.4	22
	Stairs and Ramps	2.2	0	0	2.3
	External Walls	42	0.77	4.0	47
	Windows and External Doors	21	21	0.10	42
	Internal Walls and Partitions	14	1.1	0.26	15
Building Services (M&E)		17	94	0.09	111
External Works		10	5.3	0.53	16
Construction Site Impacts		14	0	0	14
Total Embodied Carbon (kg CO ₂ e)		392,625	128,889	18,790	540,305
Total Embodied Carbon (tonnes CO ₂ e)		393	129	19	540

Table 4: Embodied Carbon Results by Building Element and Life-Cycle Stage

Embodied Carbon Intensity (kg CO ₂ e/ m ² GIA)	Upfront Carbon at Practical Completion (A1-A5)	In-Use (B1-B5)	End-of-Life (C1-C4)	Embodied Carbon (A1-C4)
Total Embodied Carbon Intensity	394	129	19	542
LETI Scope: Embodied Carbon Intensity (excl. External Works)	383	-	-	-
RIBA 2030 Climate Challenge Scope: Embodied Carbon Intensity	-	-	-	542

Table 5: Embodied Carbon Intensity Comparison

For full embodied carbon scope projects biogenic carbon is included within the embodied carbon (A1-C4) figures, in line with current guidance, but is not accounted for within the upfront carbon at Practical Completion (A1-A5), the in-use embodied carbon (B1-B5) or the end-of-life (C1-C4) figures. For BREEAM projects the modelling software does not account for biogenic carbon and therefore, this figure is reported separately. Biogenic carbon storage equates to 10,671kgCO₂e.

Over two-thirds of the embodied carbon (A1-C4) emissions for this project are in the upfront carbon to Practical Completion (A1-A5) stages. As can be seen from Figure 13, the upfront carbon hotspot is primarily the substructure, however, the external walls, upper floors and frame are all responsible for significant portions of the total upfront carbon. All these elements are made up of concrete, a material with high global warming potential (GWP), resulting in a high embodied carbon figure. If these elements were to be replaced with timber or high GGBS concrete the upfront carbon and total embodied carbon of this project is very likely to decrease. This can be seen in the options appraisal in Section 5.

Figure 14 shows that building services play a far more significant role in the total embodied carbon (A1-C4) of a project, rather than in the upfront carbon (A1-A5), responsible for over 20% of the embodied carbon in this instance. Windows and doors also play a more noteworthy role when looking at the embodied carbon of this project as opposed to the upfront carbon. Both building services and windows have a higher replacement rate than other building elements and therefore impact the 'in-use' stage (B1-B5) of the building life cycle, as can be seen in Table 4. This highlights the importance of good maintenance and durable equipment. The Substructure is still the largest contributor of embodied carbon in the project, responsible for almost 40%. Increasing the quantity of cement replacements, such as GGBS, in the concrete substructure would significantly reduce the embodied carbon of this building element.

It should be noted that the total embodied carbon figures do not include operational emissions associated with Energy (B6) and Water (B7), which are outside the scope of this assessment.

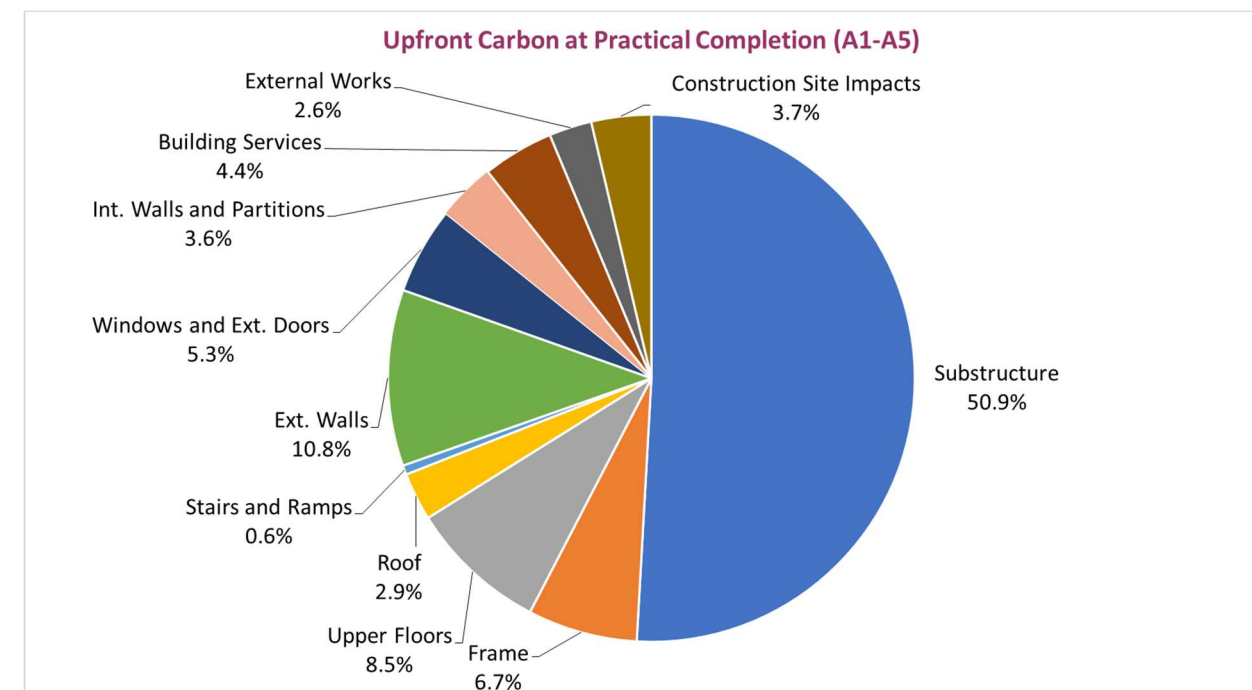


Figure 13: Upfront Carbon at Practical Completion by Building Element Group (A1-A5)

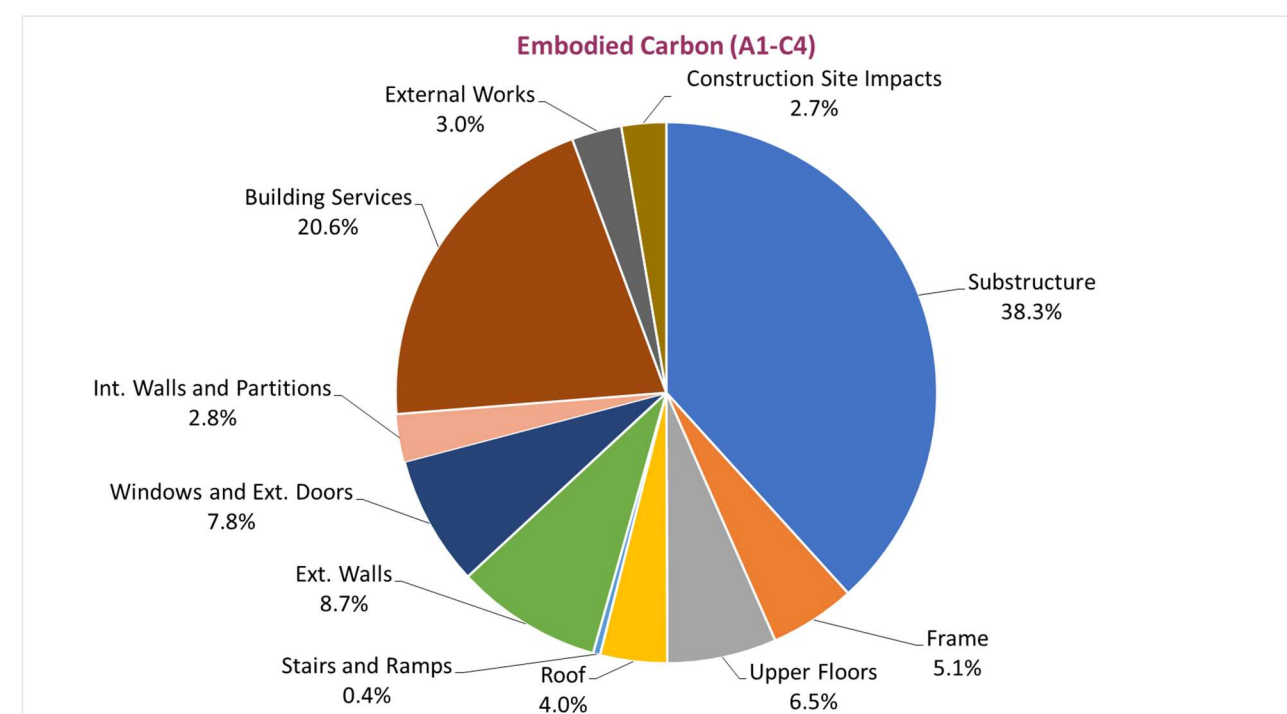


Figure 14: Embodied Carbon Over 60 Years by Building Element Group (A1-C4)

5 Stage 2 Options Appraisal: Results

LETI provides some examples of how reductions can be made to embodied carbon by element:

Reductions to embodied carbon by element

	Structure (Sub and super structure)	→ Compare the embodied carbon options for sub and superstructure at an early stage to identify an optimum solution.
		→ Typical bay studies for the horizontal and vertical grid should be conducted at concept stage for different material arrangements to determine the impact on the total embodied carbon for each framing arrangement.
		→ A structural rationalisation study should be conducted to determine the impact on overall material quantity versus efficiency in construction/fabrication.
		→ Reduce the weight of structure where possible through voids.
		→ Maximum embodied carbon quantities should be specified for structural components. Targets can be achieved by cement replacement such as GGBS, low carbon concrete mix design, low carbon materials and using recycled/repurposed materials.
		→ Structural frame should be considered to have a dual purpose, ie the structure could serve as a shading device rather than introducing additional shading elements to control solar gain.
	Envelope (Facade and roof)	→ Explore recycled sources of material.
		→ Carry out embodied carbon comparisons on typical construction bays during early design stages where decisions can be guided by benchmarks / data.
		→ Remember that it is the hidden parts (for example metal secondary framing) of a build up that often contain the most embodied carbon.
	Mechanical, Electrical and plumbing (MEP)	→ Where metals are used, limit their use and ensure they can be removed and recycled at end of life.
		→ Avoid over-provision of plant - a detailed load assessment must be undertaken.
		→ Typically, fewer and simpler systems will reduce embodied carbon.
	Mechanical, Electrical and plumbing (MEP)	→ Explore options for plant room locations which reduce duct runs.
		→ Design for deconstruction and recycling as MEP is typically replaced 2-3 times during the lifespan of a building.
		→ Specify refrigerants with low Global Warming Potential (i.e. <150) and ensure refrigerant leakage is carefully considered in the whole life carbon analysis.
	Finishes and Furniture Fixtures and equipment (FF&E)	→ Specify refrigerants with low Global Warming Potential (i.e. <150) and ensure refrigerant leakage is carefully considered in the whole life carbon analysis.
		→ Consider eliminating materials where not needed e.g. by exposing services.
		→ Utilise self-finishing internal surfaces like timber.
	Finishes and Furniture Fixtures and equipment (FF&E)	→ Consider the cleaning and maintenance regime to be undertaken.
		→ Ensure the fit out requirement is clearly understood to avoid FF&E to be replaced when the first tenant moved in.
		→ Carefully compare products based on EPD data, recycled material and also avoidance of harmful chemicals like formaldehydes and VOCs.
	Design for Manufacture and Assembly (DfMA)	→ Consider the replacement cycle and specify for longevity.
		→ Choose products that do not rely on adhesives so fabrics or finishes can be replaced.
		→ Be wary of trends that are likely to date and require early replacement.
	Design for Manufacture and Assembly (DfMA)	→ Compare embodied carbon of DfMA solutions with standard solutions.
		→ If DfMA is to be used, identify the elements by the end of RIBA Stage 2. Examples include, bathroom or WC pods, plant modules, facade elements, repeatable rooms, pre-fabricated structural elements including twin wall, columns and planks.
		→ Engage the supply chain early.
	Design for Manufacture and Assembly (DfMA)	→ Lightweight materials are preferable for transportation purpose.
		→ Ensure the repeatable systems are designed for deconstruction.

Figure 15: Embodied Carbon Reductions by Element from “Embodied Carbon Primer” (LETI, 2019)

Several options have been run at Stage 2 (Concept Design) for the superstructure, substructure, hard landscaping (external works), and building services of this project. A summary of the options run at this stage is included in the below table, and further details of these options and potential carbon savings will be discussed in the following sections. The right-hand column for potential savings (kgCO₂ eq./m²) indicates the change in embodied carbon intensity for each option. These figures can be added or subtracted from the overall embodied carbon intensity of 542 kgCO₂ eq./m² to give a new approximate overall figure compared to the target if that option was implemented.

	Scenario / Building Category	Current Specification	Alternative Specification	Potential Savings (Kg CO ₂ eq.)	Potential Savings (Kg CO ₂ eq./m ²)
1	Superstructure	Flat roof for extension	Hybrid pitched/flat roof on extension	-11,465	-11
2		RC frame throughout, flat slab ground and upper floors and blockwork walls	RC frame beneath ribbed ground floor, timber frame & CLT upper floors	-9,434	-9
3			RC frame beneath ribbed ground floor, CLT walls and upper floors	-13,588	-14
4	Substructure	Raft foundation	Piles and pile cap foundations	-22,137	-22
5		20% GGBS in foundations	40% GGBS in foundations	-33,347	-33
6		Secant pile wall and liner	Sheet piled wall	+75,617	+76
7	Hard Landscaping (External Works)	Block paving	Grasscrete	-13,033	-13
8	Building Services	Air to air heating system	Ground source heat pump with radiators	-26,951	-27
9		Air to air heating system	Air to water heating system	-34,191	-34
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9				-123,394	-124
Total Saving Over Life Cycle for Options 1, 3, 4, 5, 7 & 9 (tonnes CO ₂ eq.)				-123	

Table 6: Embodied Carbon Reduction Options

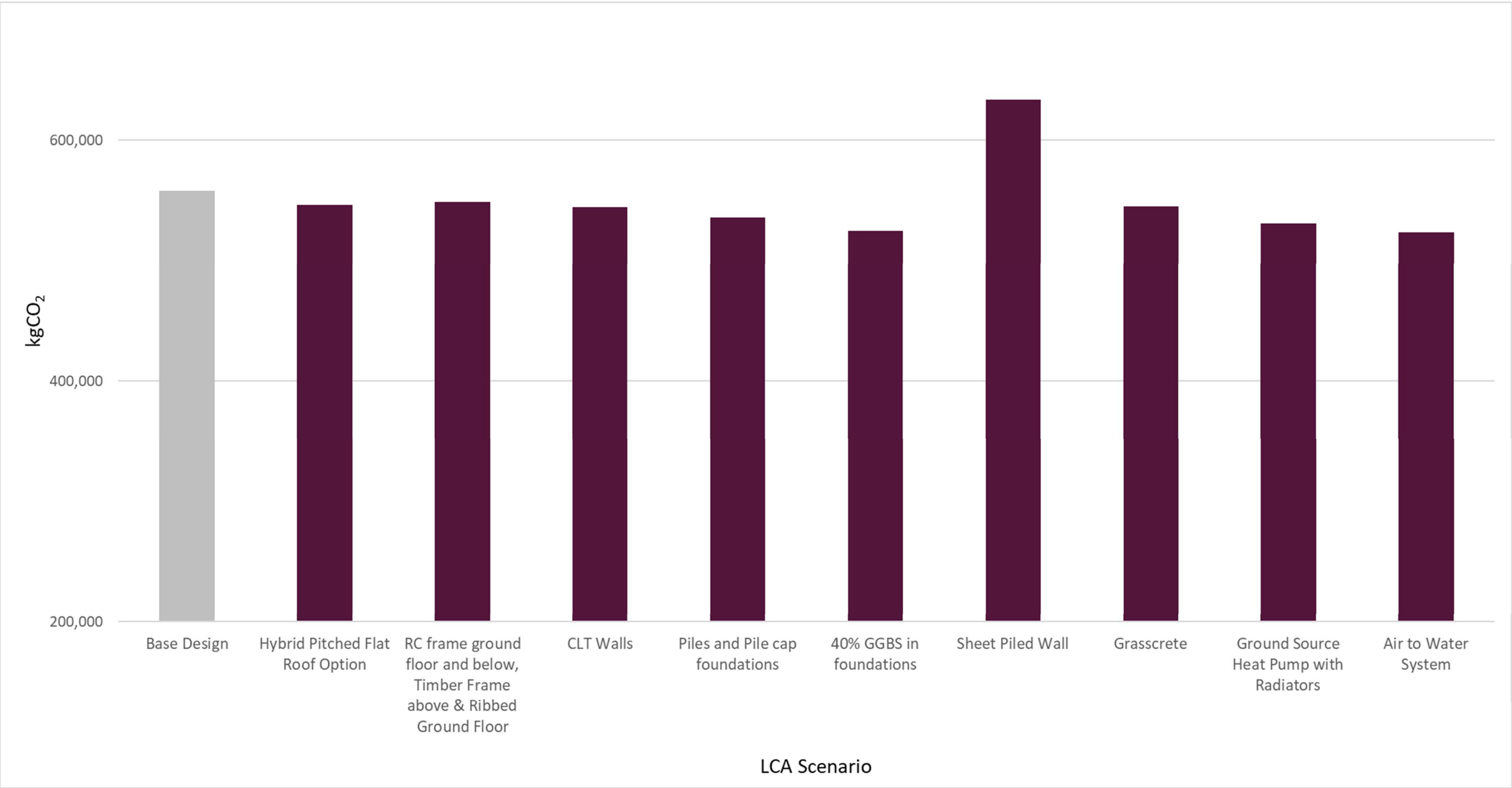


Figure 16: A Summary of the Stage 2 Options Appraisal Results Submitted to BRE

5.1 Superstructure

The BRE require two to four significantly different superstructure design options to be run. The base design for this building is one of these options. Details of the base design results are included in Section 4. Three further options are presented below in Table 7 and are also visible as the first three coloured bars (left to right) in Figure 16.

Superstructure Options	Carbon Saving (Kg CO ₂ eq.)	Percentage Change (%)
Current Specification:		
RC Frame throughout, flat slab ground and upper floors and Blockwork walls and a flat roof		
Alternatives:		
Hybrid Pitched/Flat Roof	-11,465	-2.1
RC frame beneath ribbed ground floor, timber frame & CLT upper floors	-9,434	-1.7
RC frame beneath ribbed ground floor, CLT walls and upper floors	-13,588	-2.4

Table 7: Stage 2 Superstructure Embodied Carbon Options Results.

Table 7 illustrates that all three of the alternative options achieve a lower embodied carbon figure. The hybrid pitched/flat roof option reduces the embodied carbon through a reduction in total materials. Both the CLT walls option and the timber frame option significantly reduce the amount of concrete in the building by replacing the RC frame. These options also reduce the quantity of concrete in the ground floor construction using a ribbed slab as opposed to the flat slab in the base model. However, the CLT walls option also replaces the blockwork element in the external walls with timber products which considerably improves the embodied carbon results. It is worth noting that the carbon saving with both the timber frame and CLT walls options is likely to be even larger than described in Table 7 as the lighter design would require less concrete in the substructure than the RC frame base model.

5.2 Substructure

The BRE require at least six significantly different substructure or hard landscaping design options to be run. Four substructure options have been considered as a part of this analysis. The base design for the substructure is one of these options. Details of the base design results are included in Section 4. Table 8 details the additional substructure options that have been run as a part of this analysis.

Substructure Options	Carbon Saving (Kg CO ₂ eq.)	Percentage Change (%)
Current Specification:		
Raft foundation, 20% GGBS in foundations, Secant Pile Wall, and Liner		
Alternatives:		
Piles and Pile cap foundations	-22,137	-4.0
40% GGBS in foundations	-33,347	-6.0
Sheet Piled Wall	+75,617	13.6

Table 8: Stage 2 Substructure Embodied Carbon Options Results

The piles and pile cap foundations option uses less concrete than the raft foundation in the base model and as a result has a lower embodied carbon. The primary polluter in concrete is cement, a common way to reduce the embodied carbon of concrete is to reduce the amount of cement by using replacements such as GGBS. As can be seen in Table 8, increasing the GGBS content of cement from 20% to 40% could decrease the embodied carbon of the project by 6%. Combining these two options would likely result in a significant reduction in the embodied carbon of this project. Finally, the sheet piled wall option results in a drastic increase in embodied carbon. This is because steel, like cement, has a high GWP and the quantity of steel needed for this foundation option is significant, therefore resulting in a high embodied carbon.

5.3 External Works

The BRE require at least six significantly different substructure or hard landscaping design options to be run. Two external works options have been considered as a part of this analysis. The base design for the external works is considered to be one of these options. Details of the base design results are included in Section 4. Table 9 details the one further hard landscaping options that has been run as a part of this analysis.

External Works Options	Carbon Saving (Kg CO ₂ eq.)	Percentage Change (%)
Current Specification:		
Block Paving		
Alternatives:		
Grasscrete	-13,033	-2.3

Table 9: Stage 2 External Works Embodied Carbon Options Results

The external works option illustrated in Table 9 involves the replacement of block paving paths with Grasscrete. Both products are made out of concrete, however, Grasscrete uses less concrete due to being perforated to allow space for topsoil and grass and often requires less sub-base material.

5.4 Building Services

The BRE require at least three significantly different building services design options to be run. Three building services options have been considered as a part of this analysis. The base design for building services is considered to be one of these options. Details of the base design results are included in Section 4. Table 10 details the two further building services options that have been run as a part of this analysis.

Building Services Options	Carbon Saving (Kg CO ₂ eq.)	Percentage Change (%)
Current Specification:		
Air to air heating system		
Alternatives:		
Ground Source Heat Pump with Radiators	-26,951	-4.8
Air to Water System	-34,191	-6.1

Table 10: Stage 2 Building Services Embodied Carbon Options Results

The first alternative option in Table 10 shows the result of changing an air source heat pump to a ground source heat pump, resulting in a decrease in embodied carbon by almost 27 tonnes CO₂e. The second alternative option shows a decrease in embodied carbon of 34 tonnes CO₂e. These results primarily reflect the larger quantity of refrigerant required in the base model's air to air system. Although the ground source heat pump installation will require more pipework and concrete for the boreholes the high GWP of refrigerants means the air-to-air option still has the highest embodied carbon of the three options.

6 Stage 2 Options Appraisal: Design Team Discussion

As part of the credit requirements, the design team have discussed the options modelled and provided justifications for their inclusion or exclusion from the design. These results were submitted to the BRE before the end of Stage 2.

6.1 Superstructure

Superstructure Options	Carbon Saving (Kg CO ₂ eq.)	Design Team Comments
Alternatives:		
Hybrid Pitched/Flat Roof	-11,465	HTS: Introduction of a pitched roof may use less material but will reduce area for SUDS and green roofs. NVB: The hybrid option is the preferred choice due to the inclusion of a pitched roof which conforms with the established roof pattern on site. Maintaining an area of flat roof is desirable to provide opportunities for biodiversity enhancement using either a green or blue roof.
RC frame beneath ribbed ground floor, timber frame & CLT upper floors	-9,434	HTS: Flat slabs are thinner than ribbed and timber but use a higher volume of concrete. The ribbed slab is preferred if the floor to ceiling heights can be made to work at ground floor level where the levels are dictated by the existing building. The carbon savings are likely to be higher given the lighter construction of timber resulting in a reduction of concrete required in the foundations. NVB: It is likely that the overall floor thickness will be the driving factor of the design due to the existing floor levels of Brunner House. Whilst the ribbed slab is preferred it will require complicated forms of ductwork which will impact the service area and reduce the overall floor to ceiling heights.
RC frame beneath ribbed ground floor, CLT walls and upper floors	-13,588	HTS: CLT walls providing the vertical structure leads to a reduced CO ₂ e but reduces future flexibility of the floor spaces by introducing internal structural walls and will require transfer structures at ground floor level.

Table 11: Stage 2 Superstructure Embodied Carbon Options Discussion

6.2 Substructure

Substructure Options	Carbon Saving (Kg CO ₂ eq.)	Design Team Comments
Alternatives:		
Piles and Pile cap foundations	-22,137	HTS: The preferred foundation option will be dependent on the ground conditions following the site investigations. We will design both the raft and the piled options with this info and revise the carbon calculations accordingly.
40% GGBS in foundations	-33,347	HTS: GGBS would look to be maximised if there are no issues with supply when procuring the concrete.
Sheet Piled Wall	+75,617	HTS: Use of steel sheet piles will increase the CO ₂ e and would only be used if the wall thickness needs to be minimised to reduce impact on nearby tree roots.

Table 12: Stage 2 Substructure Embodied Carbon Options Discussion

6.3 Hard Landscaping (External Works)

Hard Landscaping (External Works) Options	Carbon Saving (Kg CO ₂ eq.)	Design Team Comments
Alternatives:		
Grasscrete	-13,033	NVB: Grasscrete is the preferred choice due to its low maintenance and high load bearing capacity on sloped access. Some areas of landscaping may require block paving to provide outdoor teaching spaces.

Table 13: Stage 2 Hard Landscaping (External Works) Embodied Carbon Options Discussion

6.5 Building Services

Building Services Options	Carbon Saving (Kg CO ₂ eq.)	Design Team Comments
Alternatives:		
Ground Source Heat Pump with Radiators	-26,951	Method: Likely to be higher cost than base model and may be difficult to find space for boreholes.
Air to Water System	-34,191	Method: Taken forward for cost efficiency and low embodied carbon

Table 14: Stage 2 Building Services Embodied Carbon Options Discussion

7 Stage 4 Technical Design

If appointed, the below results table will be completed at Stage 4 to account for the update to the superstructure elements only.

7.1 Stage 4 Results

Embodied Carbon Over Life Cycle (kg CO ₂ e)	Upfront Carbon at Practical Completion (A1-A5)	In-Use (B1-B5)	End-of-Life (C1-C4)	Embodied Carbon (A1-C4)
Frame				
Upper Floors				
Roof				
Stairs and Ramps				
External Walls				
Windows and External Doors				
Total Embodied Carbon (Kg CO ₂ e)				
Total Embodied Carbon (tonnes CO ₂ e)				

Table 15: Embodied Carbon Results by Building Element and Life-Cycle Stage for Stage 4 Update (Superstructure Only)

7.2 Stage 4 Options Appraisal

If appointed, a further options appraisal will be undertaken at Stage 4 (Technical Design) for the superstructure, where two further options are to be considered. The below table will, therefore, be completed at Stage 4 once the model has been updated based on revised information from the design team.

Superstructure Options	Carbon Saving (Kg CO ₂ eq.)	Percentage Change (%)
Current Specification:		
Alternatives:		

Table 16: Stage 4 Superstructure Embodied Carbon Options Results

7.3 Stage 4 Options Appraisal: Design Team Discussion

As with Stage 2, the design team are required to discuss the options modelled at Stage 4 and provide justifications for their inclusion or exclusion from the design. The modelling and the design team comments must be completed and submitted by the end of Stage 4.

Superstructure Options	Carbon Saving (Kg CO ₂ eq.)	Design Team Comments
Alternatives:		

Table 17: Stage 4 Superstructure Embodied Carbon Options Discussion.

8 Results Comparison with Industry Benchmarks

This section details the results of the embodied carbon analysis for the BREEAM V6 scope in comparison with current industry benchmarks.

Please note, these targets are for the full embodied carbon scope as outlined by RICS, whereas this report is to the BREEAM V6 scope which excludes a number of elements. The figures below have, therefore, been included for reference only.

8.1 LETI Embodied Carbon Primer

Released in January 2020, the LETI embodied carbon primer provides supplementary guidance to the Climate Emergency Design Guide, on addressing embodied carbon impacts of buildings as part of achieving net zero targets.

The benchmarks are split by building type (Residential, Commercial, and School) and shown earlier in this report (Figures 7 and 17). In terms of scope, the LETI targets include impacts for the following building elements:

- Substructure
- Superstructure
- Internal Finishes
- Building Services

Notably, this excludes external works.

The benchmarks are quoted in terms of Upfront embodied carbon emissions only i.e., up to practical completion (Modules A1-A5) and are given as a carbon intensity i.e., kg CO₂e / m² GIFA.



Figure 17: Targets for Achieving Net-Zero Carbon from "Embodied Carbon Primer" (LETI, 2019)

8.2 RIBA 2030 Challenge

Released in 2019 and updated in 2021, RIBA's 2030 Climate Challenge was published following a vote by the RIBA Council to join the global declaration of the climate emergency.

As part of RIBA's commitment to the climate emergency declaration, they have set out a challenge for RIBA Chartered Practices to achieve the following reductions as soon as possible but as a minimum for projects in operation in 2030:

1. Reduce operational energy demand by at least 60% from current business as usual baseline figures, before offsetting.
2. Reduce embodied carbon by at least 40% from current business as usual baseline figures, before offsetting.
3. Reduce potable water use by at least 40% from CIRIA benchmark / Building Regulation figures.
4. Achieve all core health and wellbeing metrics.

RIBA have stated that these reductions will also form the basis of their recommendations to Government for future Building Regulations requirements. Benchmarks are given for domestic and non-domestic buildings separately, similar to LETI. In terms of embodied carbon scope, however, the RIBA benchmarks include impacts for all building elements, including external works, and are based on embodied carbon i.e., Modules A-C.

RIBA 2030 Climate Challenge target metrics for non-domestic (new build schools)

RIBA Sustainable Outcome Metrics	Business as usual (new build, compliance approach)	2025 Targets	2030 Targets	Notes
Operational Energy kWh/m ² /y	130 kWh/m ² /y	< 70 kWh/m ² /y	< 60 kWh/m ² /y	Targets based on GIA. Figures include regulated & unregulated energy consumption irrespective of source (grid/renewables). Refer to Department for Education Output Specifications for schools: 2025: Primary <55 kWh/m ² /y, 2030: Primary <45 kWh/m ² /y 1. Use a 'Fabric First' approach 2. Minimise energy demand. Use efficient services and low carbon heat 3. Maximise onsite renewables
Embodied Carbon kgCO ₂ e/m ²	1000 kgCO ₂ e/m ²	< 675 kgCO ₂ e/m ²	< 540 kgCO ₂ e/m ²	Use RICS Whole Life Carbon (modules A1-A5, B1-B5, C1-C4 incl sequestration). Analysis should include minimum of 95% of cost, include substructure, superstructure, finishes, fixed FF&E, building services and associated refrigerant leakage. 1. Whole Life Carbon Analysis 2. Use circular economy strategies 3. Minimise offsetting & use as last resort. Use accredited, verifiable schemes (see checklist). BAU aligned with LETI band E, 2025 target aligned with LETI band C and 2030 target aligned with LETI band B.
Potable Water Use m ³ /pupil/year	4.5 m ³ /pupil/y	< 1.5 m ³ /pupil/y	< 0.5 m ³ /pupil/y	Refer to Department for Education Output Specifications for schools.

Figure 18: Targets for Achieving Net-Zero Carbon from "2030 Climate Challenge" (RIBA, 2021)

As discussed earlier, data for Modules B and C are based on default industry figures which are less robust than upfront carbon emissions (Module A) at this time. Having said this, the significant impacts of replacement and maintenance works are highlighted within this report, and this is an area which is important to consider in all projects.

8.3 Benchmark Results Summary

The table below shows the current LETI and RIBA targets for residential, office, and school buildings.

		Targets (kgCO ₂ /m ²)		
		Residential	Commercial Office	School
LETI Targets A1-A5 Excl. External Works	LETI Business as Usual	800	1000	1000
	LETI 2020	500	600	600
	LETI 2030	300	350	350
RIBA Targets A-C	RIBA Business as Usual	1200	1400	1000
	RIBA 2025	800	970	675
	RIBA 2030	625	750	540

Figure 19: LETI and RIBA Benchmark Summary

- Brunner House Redevelopment (LETI Scope): **383 kg CO₂e/m²**
- Brunner House Redevelopment (RIBA Scope): **542 kg CO₂e/m²**

These results currently meet the LETI 2020 and RIBA 2025 targets, but exceed the LETI 2030 and RIBA 2030 targets, as shown in Figure 19.

9 Conclusion

Method Consulting has been appointed on behalf of Channing School, to conduct a life-cycle assessment study of embodied carbon emissions (measured in carbon dioxide equivalents, kgCO₂e) of the Brunner House Redevelopment in Haringey, London. The project is an extension and refurbishment of the existing Brunner House building with the aim to provide new science and DT facilities.

This report quantifies the embodied carbon, to the BREEAM V6 scope, of this new-build project at RIBA Construction Stage 2 (Concept Design), which has a Gross Internal Area (GIA) of 997.12m².

It should be noted that this report currently includes the results of the materials entered for the BREEAM V6 Mat 01 scope at Concept Design (RIBA Construction Stage 2), and that if appointed, this report will be updated and re-issued at the end of RIBA Construction Stage 4 to include any changes to the superstructure which may have taken place following design progression. The embodied carbon figures noted within this report for the superstructure are, therefore, subject to change.

Several options have been run for the Superstructure, Substructure, Hard Landscaping (External Works), and Building Services, whilst Operational Energy (Module B6) and Operational Water (Module B7) have been excluded as they are outside the scope of assessment.

The principal results are as follows:

- Upfront Carbon at Practical Completion (A1-A5): **393 tonnes CO₂e (394 kg CO₂e/m²)**
- Embodied Carbon (A1-C4): **540 tonnes CO₂e (542 kg CO₂e/m²)**

The design team have discussed the options modelled and provided justifications for their inclusion or exclusion from the design. Following these discussions, the results of the modelling have been downloaded from the modelling software and the BREEAM Mat 01/02 Results Submission Tool has been submitted. This has now been uploaded by the BREEAM Assessor to the relevant portal.

10 Appendices

10.1 RICS Building Elements

	Building part/Element group	Building element
	Demolition	0.1 Toxic/Hazardous/Contaminated Material treatment
		0.2 Major Demolition Works
0	Facilitating works	0.3 & 0.5 Temporary/Enabling Works
		0.4 Specialist groundworks
1	Substructure	1.1 Substructure
2	Superstructure	2.1 Frame
		2.2 Upper floors incl. balconies
		2.3 Roof
		2.4 Stairs and ramps
2	Superstructure	2.5 External Walls
		2.6 Windows and External Doors
2	Superstructure	2.7 Internal Walls and Partitions
		2.8 Internal Doors
3	Finishes	3.1 Wall finishes
		3.2 Floor finishes
		3.3 Ceiling finishes
4	Fittings, furnishings and equipment (FF&E)	4.1 Fittings, Furnishings & Equipment incl. Building-related* and Non-building-related**
5	Building services/MEP	5.1–5.14 Services incl. Building-related* and Non-building-related**
6	Prefabricated Buildings and Building Units	6.1 Prefabricated Buildings and Building Units
7	Work to Existing Building	7.1 Minor Demolition and Alteration Works
8	External works	8.1 Site preparation works
		8.2 Roads, Paths, Pavings and Surfacing
		8.3 Soft landscaping, Planting and Irrigation Systems
		8.4 Fencing, Railings and Walls
		8.5 External fixtures
		8.6 External drainage
		8.7 External Services
		8.8 Minor Building Works and Ancillary Buildings

Figure 20: Building Elements
from “Whole Life Carbon Assessment for the Built Environment” (RICS, 2017)

10.2 Material Modelling Assumptions and Limitations

Assumptions and limitations for material types and quantities are listed below. The list provided is only a summary and is not an exhaustive list of assumptions and limitations. It should also be noted that we can only model based on information that the design team provides.

Unless otherwise specified by the design team, the following product specifications have been included, as per the default specifications for main building materials from RICS’ Whole Life Carbon Assessment for the Built Environment (2017) Professional Statement:

	Material	Details	Specification
1.	Concrete	Piling	C32/40 20% cement replacement [1]
		Substructure	C32/40 20% cement replacement [1]
		Superstructure	C32/40 20% cement replacement [1]
		Generic concrete	C16/20 0% cement replacement [1]
2.	Steel	Reinforcement bars	97% Recycled Content [2]
		Structural steel sections	20% Recycled Content [3]
		Studwork/Support frames	Galvanised steel, 15% Recycled Content [4]
3.	Blockwork	Precast concrete blocks	Lightweight blocks for building envelope
			Dense blocks for other uses
4.	Timber	Manufactured structural timber CLT, Glulam, etc.	100% FSC/PEFC [5]
		Formwork	Plywood
		Studwork/Framing/Flooring	Softwood
5.	Aluminium	Cladding panels	Aluminium sheet, 35% Recycled Content [6]
		Glazing frames	Aluminium extrusions, 35% Recycled Content [6]
6.	Plasterboard	Partitioning/Ceilings	Min. 60% Recycled Content [7]
7.	Insulation	To floors, roofs & external walls	PIR

Figure 21: Default Specifications for Building Materials
from “Whole Life Carbon Assessment for the Built Environment” (RICS, 2017)

10.2.1 Substructure

- The quantities and reinforcement rates have been provided as worse case scenarios pending more detailed design.
- Recycled content for concrete steel reinforcement assumed to be 97% from Figure 21.
- No carbonisation has been included for any concrete materials.

10.2.2 Superstructure

Roof:

- The rafters in the pitched roof build up were assumed to be spaced at 600mm centres
- Windows, and Aluminium Glazed External Doors.

10.2.3 Building Services

- The pipework and ductwork quantities were calculated using measurements taken from the drawings
- As the pipework lengths are taken from the drawings the quantity of R32 refrigerant in the air-to-air system is based on these numbers and therefore may not be entirely accurate.

10.2.4 External Works

- Block Paving was assumed to be 60mm thick.

10.3 Information Required for Improved Accuracy

Information Required Per Material / Product	Measurement Unit
Recycled Content	Percentage
Construction Wastage*	Percentage
Material Lifespan	Number of Years
Annual Repair Rate**	Percentage
Disposal Method	Reuse / Landfill / Recycling / Incineration / Backfilling
Transport Mode for Products to Site (and distance travelled in each transport mode)	Air / Sea / Rail / Rigid HGV / Articulated HGV / Light Commercial

* Wastage defines the construction site wastage for the material. Wastage default values are set based on typical wastages, and they will vary based on construction process, building and design. Wastage is calculated in the A5 part of the lifecycle.

** If this product/material can be expected to be subject to mandatory annual repairs, the % of the product that shall be replaced as a consequence of such repairs can be set. For example, a % of street level windows may be broken annually. This value is set as the annual rate of repair, and thus the total rate of repair over the lifetime of the asset is annual repair rate, multiplied by the number of years of assessment. If one window in ten breaks every five years, approximate annual repair rate is 2%.



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Berkeley House
Hunts Rise,
Swindon, SN3 4TG

Oxford
One St Aldate's
Oxford
OX1 1DE

Bristol
22-24 Queen Square
Bristol
BS1 4ND

Exeter
Clockwise Exeter
Broadwalk House
Devon, EX1 1TS

Cornwall
Victoria Offices & Conference Centre
Station Approach, Victoria
St. Austell, PL26 8LG

5.3 Appendix C – Travel Plan

The Channing School

Brunner House, The Channing School

School Travel Plan

October 2023

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1 INTRODUCTION

- 1.1 The purpose of this School BREEAM Travel Plan ('STP') is to provide long-term strategies aimed at changing travel habits away from unsustainable use of the private car to more sustainable modes such as walking, cycling, public transport and car sharing.
- 1.2 Changing travel habits can be achieved through measures such as the distribution of travel information, provision of facilities, and the promotion of incentives to travel sustainably, all of which reflects current central and local government policy.
- 1.3 The primary objective is to reduce unnecessary vehicular trips associated with the development and to increase the use of alternative, more sustainable and active modes of transport.
- 1.4 The Travel Plan has been prepared to reflect the need to consider the travel habits of both staff and pupils of the school.
- 1.5 This Travel Plan has been prepared in accordance with TfL's guidance for Travel Plans (2013).
- 1.6 The school is registered with TfL's STARS accreditation scheme:

<https://stars.tfl.gov.uk/School/102162>

School Travel Plan Benefits

- 1.7 The benefits of implementing a School Travel Plan are:
- Reduce vehicle congestion around the school and improve air quality.
 - Contribute to a safer environment for walking, scooting and cycling.
 - Remove both perceived and actual barriers to walking, cycling and taking public transport to / from school.
 - Encourage healthier travel behaviours and habits.
 - Encourage positive travel behaviour change in parents / carers.

BREEAM Travel Assessment Checklist

- 1.8 As a minimum, the measures outlined in **Table 1.1** have been considered when developing the STP. Many of the measures are already in place, given the site's accessible location to public transport, walking and cycling modes, which will be further outlined in Section 2.

Table 1.1: BREEAM Checklist		
Measures	Checklist	Comment
The existing AI calculated in Tra 01 achieves the following: ≥ 4 for prison or MOD sites, rural location sensitive buildings, and other building group 3 ≥ 8 for all other building types	✓	According to the PTAL calculation for the site, an AI score of 13.72 is achieved.
Negotiation with local bus, train or tram companies an increase in the local service provision for the development	N/A	The existing site benefits from a moderate-good level of accessibility to public transport as a consequence of its location in proximity to Archway Underground Station and numerous bus services. It would not be appropriate or feasible to improve the existing public transport opportunities available.
Provision of a public transport information system in a publicly accessible area	N/A	The school would not provide a live public transport information system. Instead the schools website will provide information for the use of journey planning websites for parents / guardians and students to use.
Provision of electric recharging stations	N/A	No parking will be provided on-site, car-free development.
Provision of parking priority spaces for car sharers	N/A	No parking will be provided on-site, car-free development.
Consultation with the local authority on the state of the local cycling network and on improvements	N/A	The existing cycling network is a sufficient standard and therefore does not require consultation with the local authority. If improvements are required in the future a consultation with the local authority will be undertaken.
Provision of dedicated and convenient cycle storage	✓	The school offers space for 20 cycles which are provided on-site with some of the parking being covered.
Provision of cyclists' facilities	✓	Cycle parking provided on-site.
Existing amenities – at least three existing amenities are present	✓	Detailed within Section 2 – Local Amenities
Ensure a minimum of one new accessible amenity, for the relevant Building Group, is provided OR ensure more than one new accessible amenity for the relevant Building Group, is provided.	N/A	This is not possible with the building type proposed.

Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan. Submit this for review by BRE.	*	Not achieved.
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Report Structure

1.9 This School Travel Plan has been written as a standalone document and contains all the information needed to effectively implement and monitor the Travel Plan.

1.10 The remainder of this Travel Plan is structured as follows:

- Section 2 outlines the site characteristics, accessibility and existing travel patterns;
- Section 3 sets out the objectives and targets of the travel plan;
- Section 4 outlines the travel plan strategy including management and marketing;
- Section 5 sets out the measures that will be implemented;
- Section 6 outlines the monitoring and review programme;
- Section 7 lists contacts and useful information; and,
- Section 8 sets out an Action Plan for the school.

2 ACCESSIBILITY AND TRAVEL PATTERNS

School Overview

- 2.1 The Channing School is an independent day school for girls aged 4-18, accommodating students throughout their educational careers between Reception and Sixth Form.
- 2.2 The junior school buildings are located to the south of the B519 Highgate Hill, which extends between the B519 Highgate High Street to the west and the A1 Archway Road to the southeast. The senior school buildings are located to the north of the B519 Highgate Hill and to the southeast of Cholmeley Park. This Travel Plan focuses solely on the Senior School.
- 2.3 The school proposes a series of improvements as part of its masterplan to provide improvements to teaching and community facilities, complemented by improvements to landscaping and access. The first phase of the development proposals is focused on Brunner House which is part of the senior school.
- 2.4 The location of the site in relation to the local area is illustrated in **Figure 2.1** below.

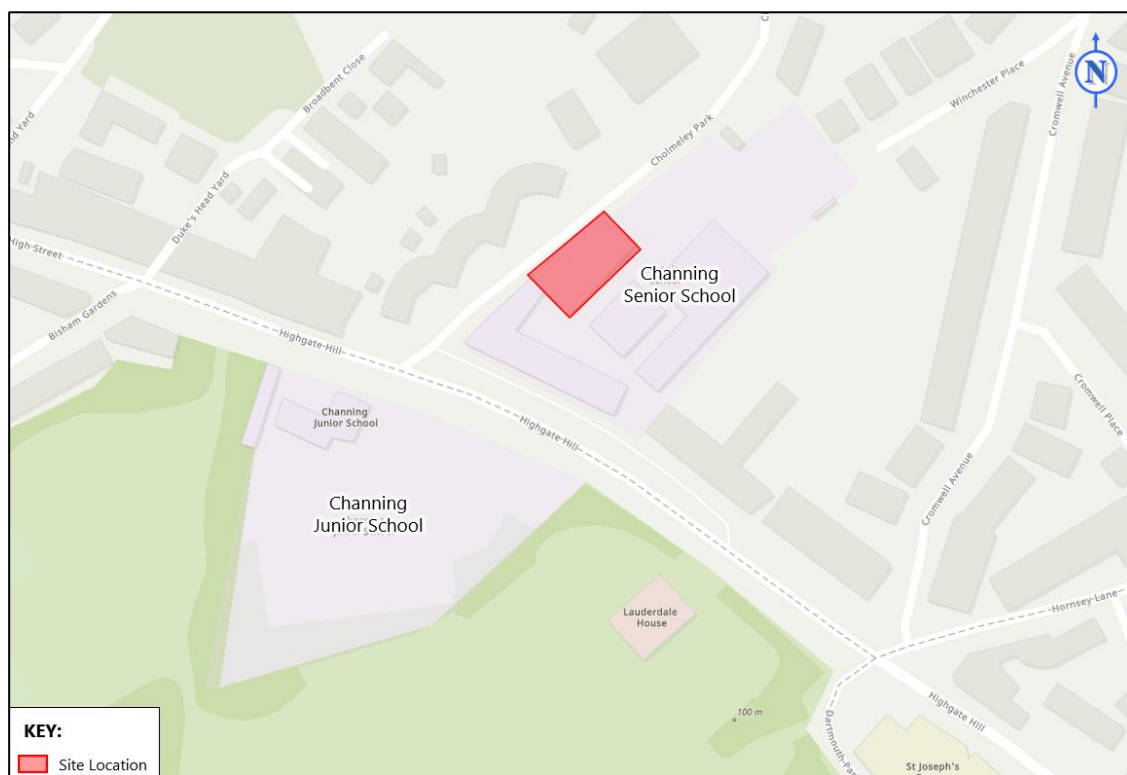


Figure 2.1: Site Location Plan

Source: ArcGIS Pro 2023

Local Highway Network

The Bank

- 2.5 The Bank offers one-way traffic flow operating parallel to the B519 Highgate Hill in a predominantly east to west direction, joining the B519 Highgate Hill in the east with Cholmeley Park to the west. The Bank is located to the south of the site and is circa 3m wide at its narrowest point near the site frontage.
- 2.6 The Bank has a weight restriction in place which prevents goods vehicles in excess of 7.5t from using it at all times. The Bank is predominantly controlled by double yellow lines, however on the northern side of the carriageway there are 5 on-street car parking bays which are part of the 'HG A' Controlled Parking Zone (CPZ) which controls parking between 10:00-12:00 on weekdays. In addition, near the junction of The Bank with Cholmeley Park, there is a circa 6.5m long stretch of single yellow line on the northern side of the carriageway which allows loading / stopping on-street at all times.

B519 Highgate Hill

- 2.7 The B519 Highgate Hill offers two-way traffic flow operating to the south of the site, connecting the A1 Archway Road to the southeast with the B519 Highgate High Street to the west. Outside of the site, the B519 Highgate Hill is circa 13.5m in width however due to on-street parking bays on both sides of the road and the presence of a bus stop on the north side of the carriageway, the effective width narrows to circa 8.5m. The B519 Highgate Hill has a speed limit of 20mph in proximity of the site.
- 2.8 The B519 Highgate Hill is predominantly lined with on-street car parking bays on both sides of the carriageway. The parking bays on the north side of the carriageway are part of the 'HG A' CPZ which controls parking between 10:00-12:00 on weekdays, while the bays on the south side of the carriageway are part of the 'CA U' CPZ which controls parking between 10:00-12:00 on weekdays, while also allowing people to pay by phone to park in the controlled hours for up to 90 minutes. On the north side of the B519 Highgate Hill outside the site there is a gap of parking bays and a bus stop is located in this gap. The remainder of the carriageway close to the site features double yellow lines.

Cholmeley Park

- 2.9 Cholmeley Park offers two-way traffic flow operating to the west of the site, connecting the A1 Archway Road to the north with the B519 Highgate Hill to the south. Outside of the site, the B519 Highgate Hill is circa 6m in width however due to on-street parking bays on both sides of the road along some sections of Cholmeley Park, the effective width can be as narrow as circa 3.7m in some places. Cholmeley Park has a speed limit of 20mph in proximity of the site.
- 2.10 Cholmeley Park has a significant number of on-street car parking bays along the carriageway, with some sections having bays on both sides of the carriageway. The parking bays on both sides of the carriageway are part of the 'HG A' CPZ which controls parking between 10:00-12:00 on weekdays. The remainder of the carriageway close to the site features double yellow lines, which are controlled by signs to prevent all stopping between 08:00 – 17:00.

Controlled Parking Zone

- 2.11 The site is located within Controlled Parking Zone (CPZ) 'HG A' which is operational Monday – Friday between 10:00 – 12:00.
- 2.12 The south side of the B519 Highgate Hill is located within Controlled Parking Zone (CPZ) 'CA U' which is also operational Monday – Friday between 10:00 – 12:00.

Local Amenities

- 2.13 In accordance with BREEAM 2018 guidance, the number and type of existing facilities within a 500m walking distance of the site have been considered, as set out in **Table 2.3**.

Table 2.3: Location of Existing Facilities			
Amenity	Within 500m?	Name of Facility	Distance from Site
Appropriate food outlet	✓	Tesco Express	160m
Access to cash	✗	TSB Bank	770m
Outdoor Open Space	✓	Waterlow Park	70m
Recreation or leisure facility	✓	Facilities Available On-Site for Pupils and Staff	0m
Postal facility	✗	Upper Holloway Post Office	1.2km
Community Facility	✓	Highgate Literary and Scientific Institution	340m
Over the Counter Pharmacy	✓	Bailey & Saunders Pharmacy	250m
Public Sector GP	✗	Brookfield Park Surgery	880m
Childcare Facility or School	✓	The Site	0m

Active Modes

Access by Foot

- 2.14 A person's willingness to walk is dependent on many factors including access to a car, safety, road congestion, weather, gradients, parking, health, direction of route and purpose of journey.
- 2.15 There are sufficient footways located on the west side of Cholmeley Park which is approximately 2m in width and similarly wide footways on the B519 Highgate Hill / The Bank. There is a signalised pedestrian crossing located circa 60m east of the site along the B519 Highgate Hill which is equipped with dropped kerbs, tactile paving and green man controls. Approximately 120m to the west of the site there is another pedestrian crossing with the same features in addition to a pedestrian island refuge point. These two crossings provide both students and staff at the school with two high-quality crossings along the B519 Highgate Hill within a 2-minute walk of the site.
- 2.16 The public transport services available within reasonable / convenient walking distances of the school building are summarised in **Table 2.4**.

Table 2.4: Approximate Distances to Transport Services			
Amenity	Location	Distance (metres)	Approximate Walking Time (minutes)
Bus Stops	Channing School (Stop D)	50m	1 minutes
	Bisham Gardens (Stop K)	110m	1 minutes
	Cromwell Avenue (Stop HU)	210m	3 minutes
	Cromwell Avenue (Stop HR)	230m	3 minutes
Rail Stations	Archway Underground Station	770m	10 minutes

Access by Cycle

- 2.17 Locations such as Muswell Hill, Wood Green, Finsbury Park, Holloway, Highbury, Camden Town, Hampstead, Golders Green and much of Finchley are within a 5km (20m minute) cycle ride of the site as depicted by **Figure 2.2** below.

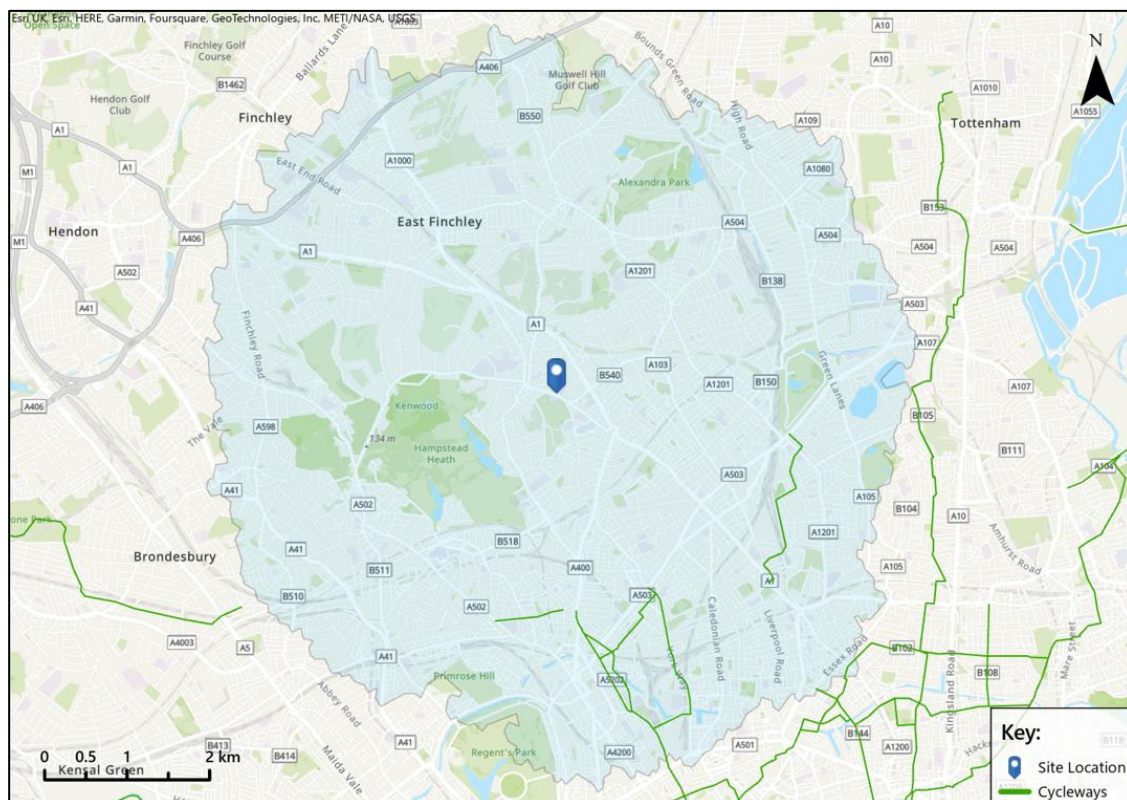


Figure 2.2: 20-Minute Cycling Distance

Source: ArcGIS Pro 2023

- 2.18 There is no direct connection to the TfL cycle network close to the site, with the closest Cycleway being an unnamed route which is 2.8km (11 minutes' cycle) south of the site operating from Kentish Town into Central London.
- 2.19 Despite this, there are a number of local cycle routes within the immediate vicinity of the site, as demonstrated in **Figure 2.3**.



Figure 2.3: Cycle Routes

Source: Open Cycle Map

- 2.20 There are local cycle routes which operate along South Grove and Fitzroy Park which provide cycle access to Highgate Hill which can sufficiently be used by both students and staff to travel to / from the school. These routes connect to a wider range of local routes which operate across Harringay providing access to destinations such as Hampstead, Dartmouth Park and Gospel Oak, which all provide ample public transport services including rail, underground and bus services.

Access by Public Transport

Public Transport Accessibility Level (PTAL)

- 2.21 Public Transport Accessibility Levels (PTALs) are a theoretical measure of the accessibility of a given point to the public transport network, taking into account walk access time and service availability.
- 2.22 The PTAL is categorised in six levels, 1 to 6 where 6 represents an excellent level of accessibility and 1 a poor level of accessibility. It is then further sub-sectioned into 'a' and 'b', with 'a' being at the lower end of the spectrum and 'b' at the higher.

2.23 The assessment methodology reflects:

- Walking time from the point of interest to the public transport access points;
- The reliability of the service modes available;
- The number of services available within the catchment; and
- The level of service at the public transport access points – i.e. average waiting time.

2.24 The PTAL rating of the centre of the site is 3, indicating that the site has a moderate level of accessibility to public transport. It is noted that the site is split across several PTAL tiles on the TfL PTAL tool and that while the centre is a 4, the tiles to the north, east, south and west are all a 4 which indicates a good PTAL rating.

Bus Services

2.25 There are a number of regular bus services that operate in the vicinity of the site with the closest bus stop being directly outside the site on the B519 Highgate Hill (Channing School Stop 'D'). All bus stops close to the site are provided with timetable information, with some stops also featuring a modern bus shelter and seating.

2.26 The entirety of the London Bus network can be used by disabled staff and guests, owing to all buses containing a ramp and being low-floor accessible vehicles. In addition, all London buses are equipped with the 'iBus' system which provides audio / visual updates to passengers regarding route and stop information.

2.27 **Table 2.5** summarises the services and frequencies of the buses available.

Table 2.5 Bus Summary				
Route Number	Route	Frequency (in minutes)		
		Weekdays	Saturday	Sunday
4	Archway – Tufnell Park – Finsbury Park – Highbury – Angel – Barbican – Blackfriars	6 – 9	10 – 12	9 – 12
43	Friern Barnet – Muswell Hill – Archway – Highbury – Angel – Bank – London Bridge	6 – 8	6 – 10	9 – 13
134	North Finchley – Muswell Hill – Archway – Tufnell Park – Camden Town – Euston	6 – 10	7 – 10	8 – 11
143	Archway – Highgate – East Finchley – Church End – Hendon – Brent Cross	10 – 12	11 – 12	15

210	Finsbury Park – Archway – Highgate – Hampstead – Golders Green – Brent Cross	8 – 12	10 – 13	10 – 12
214	Highgate – Gospel Oak – Camden Town – King’s Cross – Angel – Old Street	5 – 8	6 – 10	10 – 14
234	Barnet – Whetstone – Friern Barnet – Muswell Hill – Highgate – Archway	9 – 13	10 – 12	20
263	Barnet – Whetstone – Finchley – Highgate – Archway – Holloway – Highbury	7 – 10	9 – 12	10 – 13
C11	Archway – Gospel Oak – Hampstead – Cricklewood – Brent Cross	8 – 12	9 – 12	12
W5	Harringay Green Lanes – Stroud Green – Crouch End – Highgate – Archway	10 – 13	10 – 12	20

2.28 Bus routes provide access to destinations such as the City of London, Finchley, King’s Cross, Old Street, Hampstead and Brent Cross. Services also provide direct access to transport hubs such as St. Pancras International, Liverpool Street and Finsbury Park Stations.

2.29 In total, according to the TfL timetables, it can be expected that 53 services operate per hour in each direction from the bus stops located within a reasonable walking distance of the site during the AM peak, or approximately 1 service every minute.

London Underground Services

2.30 Archway Underground Station is located circa 770m to the southeast of the site (10 minutes’ walk) and provides access to the following Northern Line services during the peak hours:

- 20 trains per hour to High Barnet;
- 10 trains per hour to Modern via Bank;
- 7 trains per hour to Battersea Power Station via Charing Cross;
- 5 trains per hour to Kennington via Charing Cross;
- 4 trains per hour to Mill Hill East; and
- 2 trains per hour to Modern via Charing Cross.

2.31 In addition, Highgate Underground Station is located circa 970m north of the site (12 minutes’ walk), providing alternative access to the Northern Line services listed above.

Car Clubs

2.32 There are many existing car club vehicles located in the vicinity of the site, operated by Zipcar car club. The closest car club bay locations within the vicinity of the site are set out below:

- Zipcar x2 on Cromwell Avenue, 140m (2 minutes' walk) southeast of the site;
- Zipcar x2 on South Grove, 260m (3 minutes' walk) west of the site; and
- Zipcar x2 on Fitzwarren Gardens, 670m (8 minutes' walk) east of the site.

Travel Surveys

2.33 Detailed pupil travel information was collected in 2022 for the Senior School. The data was collected as part of a preliminary hands-up survey of the school, i.e. prior to the Travel Plan Baseline travel data collection.

2.34 The results of the survey are replicated below in **Table 2.6**.

Table 2.6: Mode Share Pupils and Staff (2022)	
Mode	Senior School Pupils
Underground	10%
Bus	39%
Walk	34%
Car	17%

2.35 Detailed staff travel information was collected in September 2023 for staff members. The data was collected as part of a preliminary online survey of school staff, i.e., prior to the Travel Plan Baseline travel data collection. In total 111 staff members were surveyed.

2.36 The results of the survey are replicated below in **Table 2.7**.

Table 2.7: Mode Share Staff (2023)

Mode	Staff
Car	23%
Train	9%
Bus	23%
Underground	13%
Bicycle / E-Scooter	9%
Walk	23%

- 2.37 It is noted that the Proposed Development will not lead to an uplift in student or staff numbers and therefore the percentage of students and staff using private vehicles is expected to remain the same and overtime decrease, as a result of the implementation of the measures and initiatives stated in Section 5.
- 2.38 The travel survey data has been used to determine targets to encourage the use of sustainable / active modes to / from the school and reduce car use dependency.

3 OBJECTIVES AND TARGETS

Introduction

3.1 This Section sets out the overarching objectives for the STP, as well as targets for the short and medium term. It includes indicators through which progress towards meeting these targets will be measured. Further information on the monitoring and review system for the Travel Plan can be found in **Chapter 6**.

- Objectives are the specific high-level results which the Travel Plan aims to achieve. They help to give the Travel Plan direction and provide a clear focus.
- Targets are the measurable goals by which progress will be assessed. The Travel Plan sets out targets which the school will seek to reach within the period covered by this Travel Plan. In addition, interim targets have been set.

Objectives

3.2 The STP's overriding objective is:

To engage with and encourage pupils, parents and staff to use sustainable ways of travelling to / from the School through both more effective promotion of active modes and journey sharing. This will minimise the impact of the development on the surrounding highway network.

3.3 The sub-objectives are:

- **Sub-objective 1:** To increase staff, parent and pupil awareness of the advantages and availability of sustainable / active modes of transport;
- **Sub-objective 2:** To promote the health and fitness benefits of active travel to all users;
- **Sub-objective 3:** To introduce a package of physical and management measures that will facilitate staff and pupil travel by sustainable modes; and therefore,
- **Sub-objective 4:** To reduce unnecessary use of the car for the journey to and from the School.

Targets

- 3.4 Targets are measurable goals by which the progress of the travel plan will be assessed. Targets are essential for monitoring the progress and success of the Travel Plan. Targets should be 'SMART' – specific, measurable, achievable, realistic and time-related.
- 3.5 Targets come in two forms – Action and Aim Targets. Action Targets are non-quantifiable actions that need to be achieved by a certain time, while Aim Targets are quantifiable and generally relate to the degree of modal shift the plan is seeking to achieve.

Action Targets

- 3.6 The key action targets are set out below:
- A progress report will be completed on an annual basis and will include repeat travel surveys to be completed by pupils, parents and staff;
 - Each monitoring survey will occur within one month of the anniversary of the previous year's survey; and
 - The STP will be completely reviewed and updated every three years.

Aim Targets

- 3.7 The aim targets of this STP are focused on travel undertaken by pupils, parents of pupils and school staff.
- 3.8 The key overall target of this STP will be to ensure that a degree of modal shift away from car use (in particular cars carrying a single pupil or teacher) is achieved, with students instead moving towards active modes.
- 3.9 **Table 3.1** outlines the Aim Targets set out for the school. The targets are set to measure progress towards the main objectives over three years initially. These targets are to be achieved within three years of this STP. The baseline figures are taken from **Table 2.6**, with the 2023 survey data taken from **Table 2.7** as detailed in Section 2 of this report.

Table 3.1: Travel Plan AIM Targets					
Target	Indicator	Mode Split			
		Year 0 (%)	Year 1 (%)	Year 3 (%)	Year 5 (%)
Senior School Pupils					
Achieve a 5% increase in the mode share for active modes by Year 5	Modal Split monitoring surveys for active modes	34%	35%	37%	39%
Achieve a 5% decrease in the mode share for car by Year 5	Modal Split monitoring surveys for car	17%	16%	14%	12%
Staff Members					
Achieve a 5% increase in the mode share for active modes by Year 5	Modal Split monitoring surveys for active modes	32%	33%	35%	37%
Achieve a 5% decrease in the mode share for car by Year 5	Modal Split monitoring surveys for car	23%	22%	20%	18%
Parents					
Parents to be aware of the STP and of its objectives	N/a	No Survey Required			

- 3.10 The targets will be discussed with the travel plan officers at the LBH and monitored over the course of the life of the Travel Plan and will be reviewed if necessary.

4 TRAVEL PLAN STRATEGY

Travel Plan Management

4.1 The School Travel Plan Coordinator (STPC) details are outlined below:

- **Name:** TBC

- **Position:** TBC

4.2 The STPC will be responsible for overseeing the management, development, implementation, monitoring and review of this STP. If there is any change in the specified person, LBH will be notified.

School Travel Plan Coordinator Responsibilities

4.3 The STPC will be responsible for overseeing the Travel Plan. The primary responsibilities of this role include:

- The implementation of measures as set out in the Travel Plan.
- Managing the development and implementation of the Travel Plan measures;
- Promoting the objectives and benefits of the Travel Plan;
- Monitoring the success of the Travel Plan against the agreed targets;
- Reporting the results of the Travel Plan to Council Travel Plan Officers; and
- Acting as a point of contact for all staff / pupils / parents regarding travel and the Travel Plan.

4.4 Regular updating of the Travel Plan document is part of the responsibility of the nominated person.

Staff Marketing Strategy

4.5 Staff at the school will be made aware of the existence of the STP following its adoption and upon the commencement of their employment. The details of the Travel Plan, its objectives in enhancing the environment and the role of individuals in achieving the objectives of the Travel Plan will be explained upon acceptance of job offers and noted in job interviews or similar.

4.6 The following will be used as a means of disseminating information to staff to promote events / campaigns / promotions / services / initiatives:

- Staff notice boards;
- Staff newsletters;
- Social media; and
- Staff intranet.

5 MEASURES AND INITIATIVES

Introduction

- 5.1 This section of the Travel Plan outlines the specific physical and management measures to be implemented as part of the Travel Plan.

School Website

- 5.2 The school website, <https://www.channing.co.uk/> will continue be updated regularly to include comprehensive detail on how to access the school through sustainable and, particularly, active modes.

- 5.3 Website advice will include:

- Public transport information, including routes to the school from local public transport access points;
- Information on cycling, including details such as safe routes to the school and the availability of secure cycle parking;
- Safe walking routes to / from local residential neighbourhoods;
- Any events being held by the school to promote sustainable travel; and
- Details of the school bus routes and timetables.

- 5.4 The school has a dedicated page within the website which provided detailed information regarding school travel, including access to a detailed pamphlet providing information on how to travel to the school. This can be found via the following link:

<https://www.channing.co.uk/admissions/transport/>

Drop-Off & Collection Routine

- 5.5 As with all educational uses, specific attention needs to be paid to dropping off / picking up facilities and the impact of on-street parking on residential roads at the start and end of school days. The school is aware of the importance in lowering car use and particularly drop-off / pick-up activity, and this is therefore a key driver of the travel plan measures.

- 5.6 As part of the proposed STP measures, a member of staff will patrol the school frontage on the B519 Highgate Hill / The Bank during peak drop-off / pick-up times to inform parents that they must not block the carriageway or stop on the double yellow lines near to the school.
- 5.7 The majority of students are currently dropped off / picked up on The Bank to south of the site or on Cholmeley Park to the west of the site. Both of these roads are well lit and feature a high-quality pedestrian environment where students can safely congregate while waiting to be picked up after school. Both roads feature double yellow line controls near the school to prevent parking and therefore maintain pedestrian safety, while Cholmeley Park also features banners encouraging parents to park appropriately and avoid areas with double yellow lines.
- 5.8 Parents will be informed of the drop-off and pick-up strategy employed by the school via the school's newsletter and email system or as appropriate. Information relating to a relevant car sharing scheme which will be employed by the school (discussed further within the following heading) will also be disseminated in this manner.

Car Sharing Application (e.g. HomeRun Database)

- 5.9 The school will engage with a car sharing application such as HomeRun, which will provide a bespoke service that allows users (parents and staff) to connect with other application users whose children attend the same school and who work at the same school. This car sharing application could be expanded to include other local schools if considered suitable / appropriate.
- 5.10 Typical features of car sharing applications include:
- A platform to connect parents who live in the same area or have children at nearby schools to encourage journey sharing. This helps integrate all year groups and to expand the parent / school community.
 - Parents can track the location of their children on their trip to / from school through the associated app on their mobile device. This also saves historical journey data which the school can use to identify issues on pupil's journeys to / from the school as well as to share carbon offsetting goals / statistics.
 - These systems may also be employed to create 'buddy systems' which can help to arrange groups of pupils who can walk to / from school together. This can also be tracked through their mobile devices.

- The platforms typically offer a secure mobile messaging service for parents to raise issues they have around school commutes. Comments can then be issued to the council to further assist with identifying barriers parents may face with using sustainable modes of transport to the school.

Car Parking

- 5.11 There is no dedicated parking on-site for staff or parents, instead those travelling by car are required to make use of the local roads to park on. Sustainable and active modes are promoted to both staff and parents / students to reduce the need for car driver trips.

Cycle / Scooter Parking

- 5.12 The school provides space for both scooter and cycle parking on-site for staff and students. A total of 20 cycle parking spaces are provided within the school grounds of which some of the cycle parking is covered.
- 5.13 Pupils, parents and staff will be provided with information and advice concerning scooter and cycle suitable routes upon request. Cycling resources are available from TfL's website and cycle routing via <https://tfl.gov.uk/maps/cycle?intcmp=40402&intcmp=58492&intcmp=60683> which will be advertised and made available to those that require them.
- 5.14 A number of active mode based initiatives will be implemented, including:
- Cycle use and maintenance sessions KS3/4; and
 - Continual monitoring of cycle / scooter storage facilities to ensure a suitable level of service is maintained.
- 5.15 The TPC will promote travel by bicycle primarily through information provision, but will also investigate the creation of a 'Cycle Buddy' system amongst employees (if there is demand) whereby those who are nervous or concerned about cycling in London can be accompanied by more experienced cyclists to and from their destinations in the first weeks of cycling.
- 5.16 The TPC will ensure that managers show all new staff the cyclist facilities available at the site as part of their induction. In addition, new employees will be given promotional material and if the 'Cycle Buddy' system is setup, encouraged to join this.

5.17 The TPC will provide information on the safest cycle routes in the area and promote the use of cycling to access the site. They will identify, through staff travel surveys, any problems with cycle routes and discuss possible improvements with the highway authority.

5.18 Cycling Initiatives / schemes which the TPC will explore / promote include:

- Setting up Bicycle User Groups (BUG) to increase the number of cyclists or to improve available facilities;
- Investigating whether a bicycle repair area can be setup to allow employees to repair their bicycle at work, this could include a puncture repair kit and spare inner tubes; and
- Promotion of the '*Cycle to Work Scheme*' which the School is already signed up to.

Active Measures - Pupils

Walking

5.19 The STPC has entered the school into the STARS accreditation scheme to help develop the new School Travel Plan measures. Results of the travel surveys will be added to the TfL STARS website and the STPC will liaise with the relevant local STP Officer to establish the potential for improvements to existing facilities, if necessary / appropriate, potentially based on travel plan data collection and from the car sharing application.

5.20 A number of walking-based initiatives will be implemented by the School, as follows:

- Linking parents who live nearby to form a Walking Bus service;
- Environmental and health benefits of active travel discussed or equivalent topics;
- Walk to School Week;
- Children partaking in annual whole school walk;
- Competitions to create road safety posters;
- Visit from Police to discuss road safety;
- Sponsored walks; and
- Pedestrian skills training.

Sustainable Education

- 5.21 Pupils will be informed about sustainable transport and the effect of carbon dioxide on the environment as part of the curriculum.

Competitions

- 5.22 Competitions aimed at both encouraging sustainable transport and also to spark interest in sustainable transport will be promoted by the STPC such as:

- WOW Badge Design; and
- Road safety Calendar.

- 5.23 Specific Measures that will be promoted by the STPC, including:

- Scooter / Cycle Parking; and
- Walk on Wednesday / Walk to School Week.

Sustainable Schools and Eco-School Status

- 5.24 Promoting walking and cycling to school is recommended for schools focusing on healthy living. Travel and transport have a key role in the initiatives and the Travel Plan can help to fulfil the criteria to gain Eco-Schools status and become a Sustainable School.

Active Measures – Staff

- 5.25 There are tax incentive schemes such as the Bike2Work Scheme and Bicycle User Groups for staff at the school, details of which are included below.

Bike2Work Scheme

- 5.26 The STPC will publicise the Bike2Work Scheme. There are employer and employee incentives for the Bike2Work Scheme:

Employer Incentives:

- Fitter, healthier and more productive staff;
- Healthy staff are less likely to be absent through stress or illness;

- Savings on employer NI contributions;
- Reduction of carbon footprint;
- Bike2Work will administer the scheme for the company at no extra cost; and,
- The scheme is an attractive benefit for employees.

Employee Incentives:

- Savings of up to 42% on the cost of bikes / equipment;
- Improvement in general health and well-being;
- Cost is spread over weekly / monthly interest free payments;
- Save money on travelling costs; and
- After sale service from chosen bike shops.

Bicycle Users Group (BUG)

- 5.27 BUGs are a great way for less experienced cyclists or those who are not confident in their route to gain experience by cycling with more experienced cyclists. A BUG also removes safety concerns of individual cyclists who travel alone.

Public Transport

- 5.28 Increased use of public transport is a fundamental aspect of the Government's sustainable transport strategy. It is important to recognise that, where possible, walking and cycling are usually favourable to public transport because they have fewer environmental impacts and offer health benefits. Nevertheless, public transport remains important, particularly for journeys of more than 5km.
- 5.29 Up-to-date details of bus and underground, including route information and service frequencies, will be permanently on display on a Sustainable Travel Notice Board, located in a prominent position near the main entrance / staffroom.
- 5.30 National Rail and TfL Journey Planner websites and enquiry phone numbers will also be promoted through all relevant means.

- 5.31 The STPC will promote sustainable travel for general travel as part of a healthier way of life, not only for travel to and from school.
- 5.32 The following public transport related initiatives will be implemented:
- Use of TfL School Travel Party Scheme for all trips undertaken by public transport; and,
 - The use of minibuses, coaches or public transport for visits and trips across London.
- 5.33 Discussions will be held with TfL and the relevant highway authorities on pupil safety and the provision of appropriate public transport facilities.

Parent Measures

Parents Evening

- 5.34 The STPC or an assistant will be present at parent's evenings. Advice will be given to parents on sustainable ways to get their child to / from school.

Parent and Community Consultation

- 5.35 Parents will be consulted on matters relating to the school, pick-up / drop-off changes, local highway matters of relevance and promotions relating to sustainable and active travel modes via a newsletter parent forum or similar. This will also allow parents to speak with other parents to discuss school related matters.

Taxis

- 5.36 Currently no students/staff use a taxi to travel to school on a regular basis and therefore the provision of a taxi drop-off or waiting area is not deemed necessary. For the irregular taxis that do visit the site, it is expected that these will stop on either The Bank or Cholmeley Park in a similar manner to how parents collect/drop-off currently. Staff will be discouraged from using taxis to travel to / from the school where possible.

Provision for People with Disabilities and Visual Impairment

5.37 Provision for people with disabilities has been built into the design of the building.

5.38 The following initiatives / design features / measures are present:

- The stairs have a refuge point;
- A wheelchair accessible lift; and
- Disabled Toilets.

5.39 The TPC, through dialogue with the council (if necessary / appropriate), will also seek to ensure that routes to/from public transport access points have appropriate provision for people with disabilities and people with visual impairment.

6 MONITORING AND REVIEW

Monitoring

- 6.1 This STP is part of a continuous process for improvement, requiring monitoring review and revision to ensure it remains relevant. This section sets out the proposals for monitoring and review of the Travel Plan. The Travel Plan will be monitored on a yearly cycle.
- 6.2 The monitoring programme will begin with the full Travel Survey, to be undertaken at the end of the 2023/2024 academic year. The survey will be more extensive than the preliminary survey so that further information can be collected to help understand the reasons why pupils and staff chose or do not chose to travel sustainably.
- 6.3 Further travel surveys will be undertaken annually on the anniversary of the initial baseline travel survey, alongside any other relevant recorded data.
- 6.4 A full review of the Travel Plan will occur at year 3 of the Travel Plan, in order to update targets to reflect the altered situation.
- 6.5 Additional monitoring will be useful to judge whether the implementation or proportion of certain measures employed by the School Travel Plan needs to be modified. The following factors should be monitored on an on-going basis:
- The level of usage of scooter / cycle stands;
 - Demand for a walking bus;
 - Change in pick-up/drop-off behaviour; and
 - Demand for the minibus service.
- 6.6 If demand for scooter / cycle parking exceeds supply (i.e. if more than 90% of the spaces are occupied in the peak summer months) additional parking capacity will be added until demand is met.
- 6.7 Information gathered through the monitoring process will be recorded for input to the annual review.

7 CONTACTS AND USEFUL INFORMATION

Contacts

- School Travel Plan Coordinator (STPC) – TBC
- School Travel Plan Borough Officers: TBC

Useful Websites

- TfL School Travel Plans – <https://stars.tfl.gov.uk/PublicPages/Home.aspx>
- TfL Safety & Citizenship Scheme - <https://tfl.gov.uk/info-for/schools-and-young-people/safety-and-citizenship?intcmp=5611>
- Department for Transport (DfT) – www.dft.gov.uk
- Haringey Cycling Webpage – <https://www.haringey.gov.uk/parking-roads-and-travel/travel/cycling>
- Homerun – <https://www.homerun-app.com/>
- London Cycling Campaign (LCC) – www.lcc.org.uk
- Haringey Cycling Campaign - <https://haringeycyclists.org/>
- National Rail – www.nationalrail.co.uk
- Transport for London (TfL) Journey Planner – www.tfl.gov.uk/journeyplanner
- Living Streets - www.livingstreets.org.uk

8 ACTION PLAN

- 8.1 The Action Plan outlined in the following **Table 8.1** sets out the measures included within the Travel Plan that are directed at influencing pupil and staff travel. The Action Plan will be revised every year following each Annual Travel Plan Review.

Table 8.1 Action Plan for Travel Plan Measures – Pupils and Staff

Measures	Notes	Status/ Target Date	Method of Monitoring	Responsibility
General				
Appointment of School Travel Plan Coordinator (STPC)	To be in place 1 month before the admittance of additional senior school pupils	Complete – Nigel McMahon	N/A	School
Review of School Travel Plan (STP)	Using travel surveys and other relevant survey data to monitor the success of the STP	Annually	Travel Surveys	STPC with the help of class teachers and / or teaching assistants
Information Provision				
Sustainable Travel Notice Board and the School's website	The Sustainable Travel Notice Board and the website will outline the sustainable options for travelling to the school	Prior to additional senior school pupils attending the school	N/A	STPC
Consultation with Parents and Local Community	The STPC will consult with parents via newsletters and parent forum, and will speak with the Council about matters relating to school travel	Ongoing	N/A	STPC
Cycling				
Provision of parking for scooters and cycles	Scooter and cycle parking to be provided for pupils and staff	Provided as part of development process	Spot checks as part of maintenance rounds	School
Staff discount on cycles and safety equipment (if possible)	Cycle to Work Scheme (if appropriate)	When possible	Uptake of offer monitored by STPC	STPC
Provide cycle route maps and other information relating to cycle facilities	TfL website	Ongoing	STPC to monitor uptake	STPC
Cycle Training	Participate in Bikeability / similar council initiatives	Ongoing	STPC to monitor participation levels and interest	STPC
Walking				
Walk once a Week and Walk to School Month.	School will participate in these Schemes	Ongoing / annual events	STPC to monitor uptake	STPC
Staff and pupils to be provided with information related to safe walking routes.	As part of sustainable transport education for pupils	Ongoing through lessons	NA	STPC
Vehicles				

Table 8.1 Action Plan for Travel Plan Measures – Pupils and Staff

Discouraging car travel for pick-up / drop-off routines	School to actively discourage car travel to the school through newsletters, provision of a school car sharing scheme and campaigns	Ongoing	STPC	STPC
Public Transport				
Sustainable Travel Notice Board and School website with timetable information (or online links to timetables) for both parents and staff	Located in visible public areas	Prior to additional senior school pupils attending the school	STPC	STPC