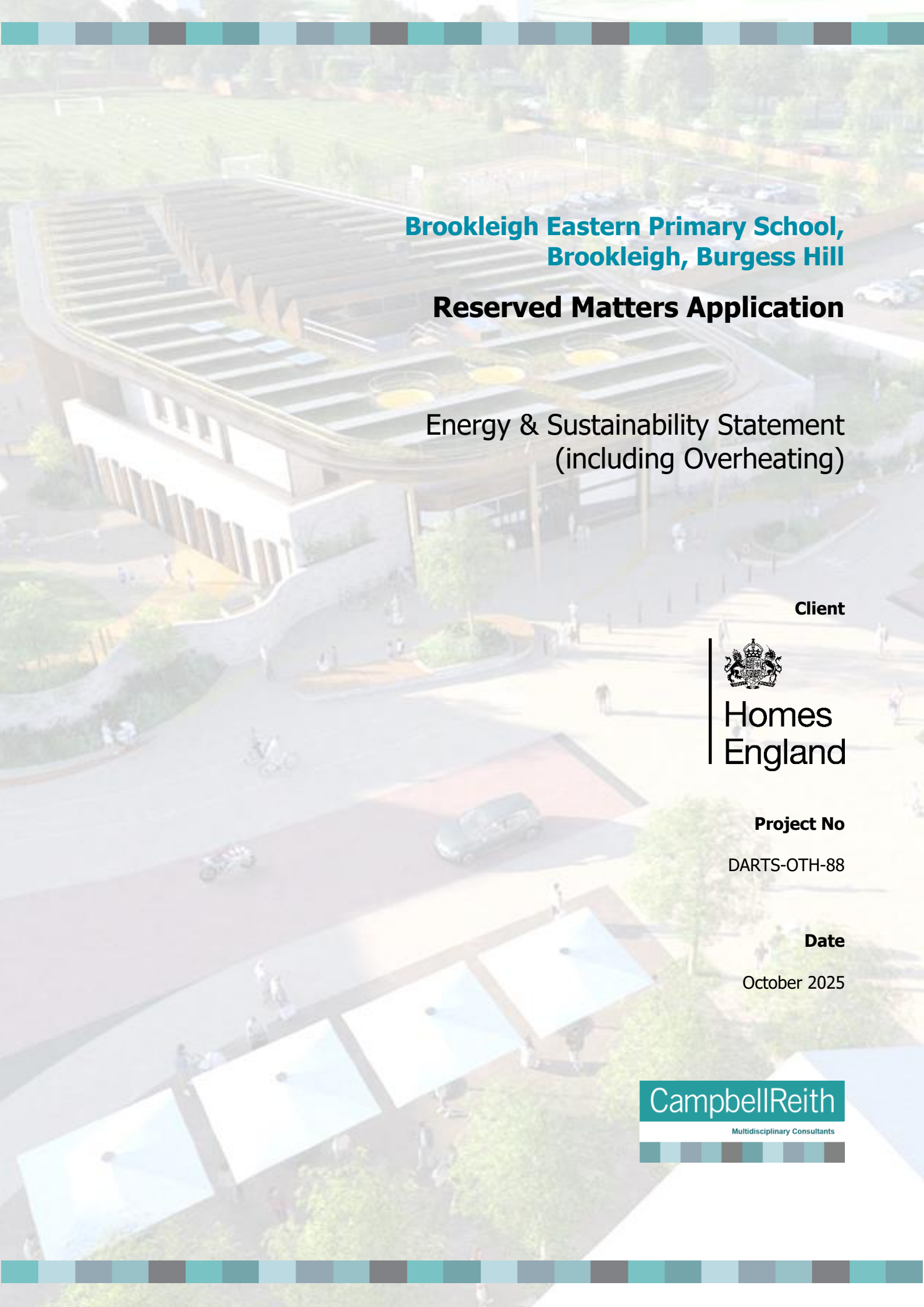


An architectural rendering of Brookleigh Eastern Primary School, showing a modern building with a curved roof and large windows, surrounded by greenery and a parking area. The rendering is overlaid with a semi-transparent white box containing text.

## **Brookleigh Eastern Primary School, Brookleigh, Burgess Hill**

### **Reserved Matters Application**

#### **Energy & Sustainability Statement (including Overheating)**

**Client**



**Homes  
England**

**Project No**

DARTS-OTH-88

**Date**

October 2025

**CampbellReith**

Multidisciplinary Consultants



**HOMES ENGLAND**

**BROOKLEIGH EASTERN PRIMARY SCHOOL, BROOKLEIGH, BURGESS HILL  
ENERGY AND SUSTAINABILITY STATEMENT [INCLUDING OVERHEATING]**

Revision 00, issued 13 October 2025



## VERSION CONTROL

| REVISION | ISSUED FOR         | DATE     | AUTHOR  | CHECKED BY |
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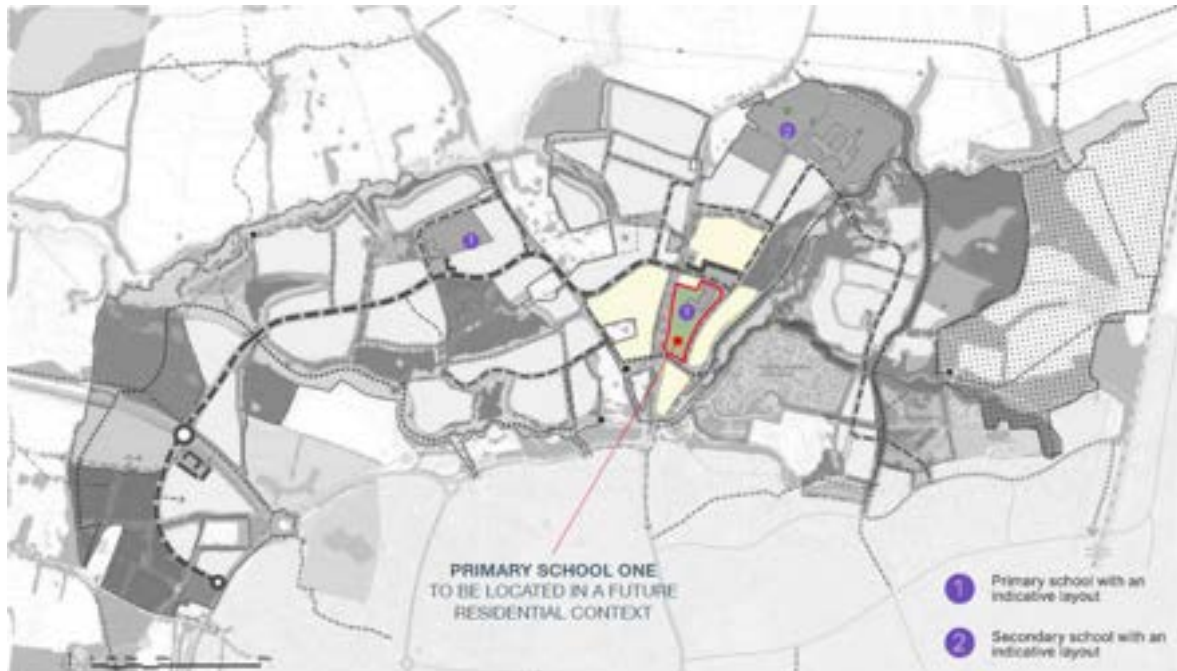
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## 1.0 INTRODUCTION

On behalf of Homes England, FLOH Consulting Ltd. has been appointed to prepare this Energy and Sustainability Statement to support a reserved matters application for a new two form entry primary school for around 420 pupils at the Burgess Hill Brookleigh (formerly known as Northern Arc) mixed use development in West Sussex.

**Figure 1.1: Overview of wider Brookeigh development (Northern Arc Design Guide)**



### 1.1 Description of development

Reserved matters application to consider access, appearance, landscaping, layout and scale pursuant to application DM/21/3279 (original reference DM/18/5114) for parcel P1.2 comprising of the construction of a primary school with nursery and special support centre, car parking, multi-use games area, playing fields, landscaping and associated infrastructure.

### 1.2 Background

At RIBA Stage 1, FLOH undertook various analyses on energy, carbon and comfort and set out how the building might be serviced.

At RIBA Stage 3, commensurate with the accepted level of detail at RIBA Stage 2, further analysis and design development has been undertaken to refine performance and approach, to ensure emerging proposals meet the required performance standard, or to develop alternative approaches where they do not.

### 1.3 Structure and content

This document provides an overview of the proposed strategy detailing how the proposed development will be efficient in its use of energy whilst ensuring a comfortable and reliable service to occupants.

The document is structured as follows:

- Overview of key policy requirements and drivers.
- Sustainability overview.
- Energy hierarchy, detailing various building analyses demonstrating carbon performance and including passive design and thermal comfort assessment.
- Engineering services response.

It is supplemented with strategy drawings and environmental treatment plans located at the appendix.

#### **1.4 Terms of reference**

Are included as footnotes within the body of the document.

#### **1.5 Glossary of terms**

|      |                                                        |
|------|--------------------------------------------------------|
| ADL  | Building Regulations Approved Document Part L          |
| ADLO | Building Regulations Approved Document Part O          |
| ASHP | Air source heat pump                                   |
| CH   | Communal heating                                       |
| CCU  | Carbon capture and utilisation                         |
| DHWS | Domestic hot water service                             |
| DX   | Direct expansion comfort cooling and/or heating system |
| GSHP | Ground source heat pump                                |
| LPHW | Low pressure hot water                                 |
| LZC  | Low zero carbon                                        |
| PV   | (Solar) Photovoltaic                                   |
| VRV  | Variable refrigerant volume                            |

#### **1.6 Limitations**

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The output of this document does not provide a proposal that could be adopted without further investigation and detailed design.

Any costs provided are budget comparative costs and exclude professional fees, statutory charges and VAT.

All parts are based on other design information available just prior to publication.

## 2.0 POLICY AND DRIVERS

### 2.1 National Planning Policy Framework

National Planning Policy Framework<sup>1</sup> (NPPF) sets out the Government's national planning policies and how these should be applied.

Such policies set out to play an active role in guiding development towards sustainable solutions.

The NPPF recognises and refers to the 2030 Agenda for Sustainable Development, which was adopted by 193 UN member states at the United Nations Sustainable Development Summit in 2015 and is described on the UK Government website as:



*... a historic global agreement to eradicate extreme poverty, fight inequality and injustice and leave no one behind. Agreed by world leaders at the UN in 2015, the 17 Sustainable Development Goals (SDGs) succeed the Millennium Development Goals (MDGs). The SDGs are universal with all signatories expected to contribute to them internationally and deliver them domestically.*

In 2019, the UK produced its first Voluntary National Review<sup>2</sup>. The Review addresses each of the goals, providing an update on progress for each, highlighting achievements, outlining challenges and identifying next steps.

In relation to sustainable development, Paragraphs 7 and 8 of the NPPF states:

7. *The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development, and supporting infrastructure in a sustainable manner. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.*

*At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection.*

8. *Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):*
  - a. *an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*
  - b. *a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*
  - c. *an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.*

---

<sup>1</sup> National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2024

<sup>2</sup> Voluntary National Review of progress towards the Sustainable Development Goals, United Kingdom of Great Britain and Northern Ireland, HM Government, June 2019

Paragraphs 162 to 169 of the NPPF provide guidance for the preparation of local plans on how to mitigate and adapt to climate change. Paragraph 165 in particular states:

*'To help increase the use and supply of renewable and low carbon energy and heat, plans should:*

- a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);*
- b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and*
- c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.'*

## 2.2 Committee on Climate Change

In May 2019, the Committee on Climate Change (CCC) published its report 'Net Zero, The UK's contribution to stopping global warming'<sup>3</sup>, recommending a net zero emissions target by 2050. The report advises policies are already in place to achieve this however should be strengthened in order to meet the 2050 target.

In its recommendations for the seventh carbon budget<sup>4</sup>, the CCC has advised the UK Government that the reduction in greenhouse gas emissions should be accelerated, aiming for a 66% and 87% reduction for residential and non residential applications respectively by 2040, if it is to achieve net zero by 2050.



## 2.3 Climate Change Act

Acknowledging advice from the CCC, the UK government made a net zero emissions target law and revised its Climate Change Act<sup>5</sup> to state that the UK is to bring all greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels.

## 2.4 MSDC adopted District Plan

Mid Sussex District Council (MSDC) adopted its District Plan<sup>6</sup> on 28<sup>th</sup> March 2018 which sets out a vision for how the council wants to evolve and a delivery strategy for how that will be achieved.

The District Plan supports the National Planning Policy Framework's 'presumption in favour of sustainable development.

Key policies relating to energy and sustainability topics are as follows:

### 2.4.1 DP39 - Sustainable Design and Construction

*All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures:*

- *Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;*



<sup>3</sup> Net Zero, The UK's contribution to stopping global warming Committee on Climate Change, May 2019

<sup>4</sup> Seventh Carbon Budget, Advice for the UK Government, Committee on Climate Change, February 2025

<sup>5</sup> Climate Change Act 2008 (c. 27) Part 1 – Carbon target and budgeting Document, November 2019

<sup>6</sup> Mid Sussex District Plan 2014 – 2031, Mid Sussex District Council, Adopted March 2018

- *Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible;*
- *Use renewable sources of energy;*
- *Maximise efficient use of resources, including minimising waste and maximising recycling / re-use of materials through both construction and occupation;*
- *Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment;*
- *Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience*

#### 2.4.2 DP42 - Water Infrastructure and the water environment

*Development must meet the following water consumption standards:*

- *Residential units should meet a water consumption standard of 110 litres per person per day (including external water use);*
- *Non-residential buildings should meet the equivalent of a 'Good' standard, as a minimum, with regard to the BREEAM water consumption targets for the development type.*

*Development proposals which increase the demand for off-site service infrastructure will be permitted where the applicant can demonstrate;*

- *that sufficient capacity already exists off-site for foul and surface water provision. Where capacity off-site is not available, plans must set out how appropriate infrastructure improvements approved by the statutory undertaker will be completed ahead of the development's occupation; and*
- *that there is adequate water supply to serve the development.*

#### 2.5 MSDC District Plan 2021 - 2039

Following review of the adopted District Plan an updated plan has been drafted with revised policies to ensure conformity with the NPPF, changing local circumstances and other national and local factors.

The draft District Plan 2021 – 2039<sup>7</sup> was submitted for Examination on 8<sup>th</sup> July 2024 and contains a number of policies with specific detail relating to sustainability and energy themes. It is acknowledged that the draft District Plan is not adopted, however key policies are summarised below:

- **DPS1 – Climate change:** Provides a general overview to a number of themes associated with carbon reduction and climate change. Policy wording states MSDC will support low carbon energy schemes and signposts to other specific policies.
- **DPS2 - Sustainable Design and Construction:** Details key energy and carbon themes, requiring sites to, unless demonstrated not technically feasible or viable, achieve (net) zero operational emissions through application of the energy hierarchy. Specific energy credits in BREEAM are cited as a requirement, as are embodied carbon targets, overheating prevention, water efficiency and waste minimisation. The policy also calls for heating to all new build developments and major refurbishments to be via renewable energy and not fossil fuels.
- **DPS3 - Renewable and Low Carbon Energy Schemes:** Provides detail on solar, wind, hydropower, ground source heat pumps, biomass, CHP and battery storage

---

<sup>7</sup> Mid Sussex District Plan 2021 – 2039, Submission Draft (Regulation 19), Mid Sussex District Council, December 2023

- DPS4 - Flood Risk and Sustainable Drainage
- DPS5 - Water Neutrality: Considers water efficient design, offsetting water use and water supplies.

## 2.6 Department for Education

As part of its School Output Specification, the Department for Education (DfE) provides a suite of technical annexes covering, amongst others Energy (Annex 2H) and Sustainability (Annex 2J).

The Sustainability Annex in particular responds to the demands of climate change. A key focus is on reducing carbon emissions, as such the following requirement is stated:

*All New Buildings shall achieve Net Zero Carbon in Operation, as defined by the standards within the Net Zero Carbon Buildings: A Framework Definition, UK Green Building Council (UK GBC), using EN15978. Recognising a development of targets over a timeline.*

Design to date has been aligned with these documents to ensure compliance can ultimately be achieved.

## 2.7 Building bulletin 101

Whilst meeting carbon targets remains a key priority, it is essential that internal conditions are delivered.

Building Bulletin 101 (BB101)<sup>8</sup> sets out regulations, standards and guidance on ventilation, thermal comfort and indoor air quality for school buildings to ensure internal conditions are delivered.

## 2.8 BREEAM

To support the delivery of a net zero carbon in operation development and ensure wider sustainability metrics are met, Homes England has stipulated that the development shall achieve BREEAM 'Excellent' rating.

## 2.9 West Sussex County Council

In April 2019, West Sussex County Council (WSCC) passed a motion pledging to try to become carbon neutral by 2030. WSCC's vision is that:

*'in 2030, West Sussex County Council is carbon neutral and climate resilient, using our limited resources wisely, and that we have enabled positive actions and behaviours across our county to mitigate and adapt to climate change'*

WSCC's Climate Action and Adaptation Plan (CAAP)<sup>9</sup> sets out how the commitments made in its Climate Change Strategy 2020 – 2030<sup>10</sup> will be delivered.

Further, WSCC's Carbon Management Plan (CMP)<sup>11</sup> sets out key actions to meet carbon commitments. The four core principles of which are:

- Reduce overall energy consumption
- Reduce demand for fossil fuel based energy
- Contribute to a greener grid

---

<sup>8</sup> Building Bulletin 101, Guidelines on ventilation, thermal comfort and indoor air quality in schools, Education & Skills Funding Agency, Version 1, 2018

<sup>9</sup> Climate Action and Adaptation Plan, Our priorities for 2024-2027, West Sussex County Council, 2024

<sup>10</sup> Climate Change Strategy 2020–2030, West Sussex County Council, 2020

<sup>11</sup> Achieving Net Zero Carbon by 2030, West Sussex County Council's Carbon Management Plan

- Take positive action to sequester carbon in the natural environment

Interestingly, the CMP states that in 2019/20 schools represented 48% of overall emissions and '*are a key area to tackle*'.

## 2.10 WSCC School Design Guides

WSCC has published a suite of design guides for its building stock as follows:

- Purple Guide, SEND Schools
- Green Guide, External Spaces
- Yellow Guide, Fabric & Materials
- Red Guide, Primary Schools
- Grey Guide, M&E Services



Of key relevance here is the 'Grey Guide'<sup>12</sup>, which provides further guidance on meeting carbon targets through the design of engineering services.

## 2.11 Summary

Key metrics

Proposals to date have sought to meet all requirements included in the above with the main design objective to develop a holistic design that balances construction complexity with lifetime performance, achieving net zero carbon in operation performance all with a primary objective of creating comfortable internal spaces for learning.

---

<sup>12</sup> The Grey Guide, M&E Services, West Sussex County Council, Version 2.0, 2020

### 3.0 SUSTAINABILITY

Whilst principles of sustainability are intrinsic to design, there is no universally accepted set of 'sustainability objectives' to capture key elements of such approaches.

However the following headlines have been adopted as the basis of the structure of this document:

- Resource consumption and climate change
- Built environment
- Communities, health and wellbeing
- Transport
- Natural environment

#### 3.1 Resource consumption and climate change

##### 3.1.1 Climate adaptation

In collaboration with the wider design team, an appraisal of different future climate scenarios has been undertaken and appropriate risk mitigation measures considered.

This is included at appendix A.

##### 3.1.2 Waste

Waste reduction and recycling is a key challenge of sustainable development.

DEFRA Guidance on applying the waste hierarchy<sup>13</sup> prioritises waste management options that are best for the environment.

**Figure 3.1: Waste hierarchy (DEFRA)**



Essentially, where waste cannot be prevented, the hierarchy prioritises preparing it for re-use, then recycling, recovery and lastly disposal (e.g. landfill).

High level strategic design responses to the waste hierarchy are summarised in the table overleaf.

<sup>13</sup> Guidance on applying the waste hierarchy, Department for Environment, Food and Rural Affairs, June 2011

**Table 3.1: Strategic approach to waste hierarchy**

| Stage                                             | Strategic response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prevention                                        | <ul style="list-style-type: none"> <li>• Whilst some levelling is required on the site, the masterplan incorporates existing boundary levels where possible in order to minimise ground works and relandscaping.</li> <li>• Materials and finishes schedules will be limited to avoid surplus materials.</li> <li>• Internal teaching space layouts are standardised, which limits construction waste.</li> <li>• Insulation with low thermal conductivity will be used to minimise amount required.</li> <li>• Wherever possible, use of short-life plastic products or packaging will be reduced or avoided.</li> <li>• Low use water fittings will be considered to minimise water use.</li> <li>• Consideration will be given to mounting bins, signage and street furniture on lighting columns to reduce number of columns required.</li> </ul>                |
| Preparing for reuse, recycling and other recovery | <ul style="list-style-type: none"> <li>• 'Off the shelf' materials, products and equipment will be prioritised over bespoke, which may only be fit for specific purposes and not be suitable for reuse.</li> <li>• Building services systems with modular design will be prioritised so that components can be replaced instead on failure instead of whole equipment being replaced.</li> <li>• Consider building services systems that recover energy, prioritising those with higher efficiencies.</li> <li>• Consideration to end of life strategies for materials and components to prioritise those which can be reused or recycled.</li> <li>• Accessible waste/ recycling storage area of sufficient size in addition to non-recyclable waste storage will be provided.</li> <li>• Organic waste facilities also required due to onsite catering.</li> </ul> |
| Disposal                                          | <ul style="list-style-type: none"> <li>• Means to divert construction waste from landfill will be prioritised.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### 3.1.3 Flood risk and sustainable drainage

A Flood Risk Assessment<sup>14</sup> has been prepared by Campbell Reith which sets out to protect the development and occupants from flooding in the present and future.

The site lies in flood zone 1, defined as having less than 1 in 1,000 annual probabilities of river or sea flooding. Further, the site is considered to have low risk from groundwater and sewer flooding.

Surface water flood risk is classified as low to medium, with two discrete ponding zones identified. These have been addressed through site regrading and strategic placement of infrastructure.

Sustainable Drainage Systems (SuDS) have been incorporated at the site to manage surface water runoff, including permeable paving, attenuation tanks, green roofs, and some localised rainwater harvesting.

Infiltration is not viable due to the site's underlying weald clay formation and shallow groundwater levels; therefore, runoff will be attenuated and discharged at a controlled rate of 7.8 l/s to the wider strategic drainage network.

The drainage strategy has been designed to accommodate storm events up to the 1 in 100 year return period, with a 45% climate change allowance. Pollution hazard indices have been assessed and mitigated through appropriate SuDS features, ensuring compliance with Construction Industry Research and Information Association (CIRIA) guidance and local planning policy.

The proposed development will not increase flood risk on or off site and is considered resilient to future climate scenarios.

<sup>14</sup> Brookleigh Eastern Primary School, Brookleigh, Burgess Hill, Flood Risk Assessment and Drainage Strategy, Campbell Reith, October 2025

#### 3.1.4 Thermal energy generation

It is of paramount importance that resources used in the proposed development are minimised.

Architectural proposals adopt a simple form and footprint as well as a high-performing envelope with fabric standards aligned to those of the DfE Output Specification. Such a fabric first approach supports the use of low and renewable energy sources for onsite thermal and electricity generation.

Refer to section 4 on energy which discusses energy generation and associated carbon emissions in further detail.

#### 3.1.5 Water efficiency

A mains water supply will be provided to the school from the adjacent South East Water network.

Throughout the building, water efficient fixtures and fittings (e.g. dual flush WCs, aerated taps, flow-controlled showers etc) and appliances (e.g. dishwashers) will be considered.

Features such as sub metering and leak detection have been considered which will in turn secure BREEAM credits to ensure the targeted 'Excellent' rating.

Collection and storage of rainwater from building roof and/or surroundings, provides a source of water that can be re-used for general irrigation. Such rain water harvesting can take the form of a simple water butt which, whilst landscaping and planting will have low or no irrigation needs generally, will be considered for implementation at the site.

It has been assumed that there are no unregulated demands for water other than landscaping, which will be serviced by manual water delivery as opposed to a fixed irrigation system.

Local rainwater harvesting in the form of water butt(s) to smaller ancillary buildings will feature in the landscaping scheme.

### 3.2 Built environment

#### 3.2.1 Passive design

Passive design has been considered prior to establishing the means of delivering thermal energy. Measures are discussed later in this document.

#### 3.2.2 Thermal comfort and overheating risk

In addition to reducing demand, such passive measures referred to previously reduce the impact of solar gain and minimise overheating to avoid the future provision of comfort cooling systems will be encouraged.

This too is discussed later in this document in section 5.

#### 3.2.3 Materials and embodied energy

Operational energy, that used for servicing buildings, has long since been a metric for demonstrating building performance and assessing carbon performance.

Embodied energy, that associated with construction, maintenance and demolition of a building must also be considered, particularly for the following stages:

- Extraction and processing of materials, energy and water consumption used by the factory or in constructing the building, and transport of materials and products.
- Construction of the development.
- Maintenance, replacement and emissions associated with refrigerant leakage.
- Demolition, disassembly waste processing and disposal of any parts of product or building and any transportation relating to the above.

Where possible, responsible sourcing of construction materials, including insulating materials, is envisaged, whereby they will be locally sourced and/or derived from renewable resources, for example:

- Timber products for partitions and rafters will be specified to be obtained from local Forest Stewardship Council (FSC) certified sources.
- Where concrete is used, such as in foundations, lower carbon cement replacements and recycled aggregates will be specified where possible.
- UK sourced, nursery stock hard landscape materials will be proposed.
- Use of local plants, grown in the UK and following industry standards through approval of plant nurseries selected, will be proposed.
- Specification of a proportion of construction materials with low environmental impact across their lifecycle is also anticipated, including external landscaping and boundary protection.

### 3.2.4 Cross laminated timber

Traditional construction materials such as steel and concrete have very high levels of embodied carbon. Here, a cross laminated timber (CLT) approach, a structural wood panel system, is being developed.

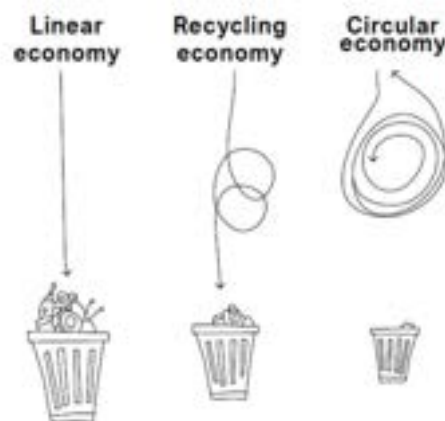
Such a system offers low embodied carbon approach when sustainably sourced timber used in CLT acts as a carbon sink, which is to say that even after harvesting and production, it not only produces no net atmospheric carbon but actively sequesters large quantities of additional carbon from the atmosphere.

Timber used in the construction of CLT can also be replenished within sustainably managed forests.

### 3.2.5 Circular economy principles

A circular economy is a system that is restorative or regenerative by intention and design. A circular economy replaces the linear economy, and its 'end-of-life' concept with restoration and regeneration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals and aims for the elimination of waste through the design of materials, products and systems that can be repaired and reused.

**Figure 3.2: Linear, recycling and circular economies (GLA)**



The three key CE principles are as follows:

- Designing for longevity
- Designing for adaptability or flexibility

- Designing for disassembly

An Adaptability and Disassembly assessment has been undertaken which is included at appendix B.

Embracing circular economy principles reduces embodied carbon therefore these will be incorporated into the development where possible and feasible to do so.

### 3.2.6 Environmental product declarations

An environmental product declaration (EPD) is considered the most reliable source of information about the environmental impacts of a particular product. EPDs provide environmental information using a consistent methodology and reporting form, stating the impact associated with the production, end of life, reuse, recovery and recycling stages of products.

Though not a specific requirement, developers will be encouraged to provide EPDs for proposed products, however it is acknowledged that such information is not readily available.

### 3.2.7 Offsite construction

Building materials and construction methods influence energy demand and have been taken into consideration when developing the scheme.

Creating repeatability within the scheme to the point where the building can be produced offsite will be considered during subsequent design however caution will be applied given this would require a high degree of coordination and may limit design flexibility.

At construction stage, it should be verified that any offsite elements meet the necessary building performance and due care and consideration applied when assembling on site to ensure required performance is maintained.

## 3.3 Communities, health and wellbeing

### 3.3.1 Community

Located at the prominent southern edge of the Eastern Neighbourhood centre within the wider Brookleigh development, the school fulfils an important civic function, both as an educational institution and a key community landmark supporting resilience, and growth of the local community.

### 3.3.2 Equality and social inclusion

Design carefully balances this civic presence with the need to provide a safe, inclusive, and high-performing environment for pupils.

### 3.3.3 Safety and crime prevention

To date the site plan has been developed utilising typical principles of secured by design to reduce opportunities for crime and anti-social behaviour.

### 3.3.4 Light pollution

External lighting will be provided. Whilst this will contribute to local light spill, glare and sky glow, the overall impact is not considered significant given the likely baseline level throughout existing neighbouring residential areas.

Notwithstanding, a lighting strategy has been developed, incorporating, where practicably possible, directional lighting to minimise light pollution.

Refer to the separate Lighting Statement<sup>15</sup> by FLOH for further details.

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<sup>15</sup> Brookleigh Eastern Primary School, Brookleigh, Burgess Hill, Lighting Assessment, FLOH Consulting, October 2025

### 3.3.5 Air quality

An Air Quality Assessment has been undertaken to consider impact for the construction phase and mitigation measures to control the risk of dust soiling during earthworks and construction as appropriate.

Risk of impact on air quality in use will be mitigated through design features such as electric car charging to encourage the use of low emission vehicles and electrically driven thermal energy generation instead of approaches using combustion.

Refer to the separate Air Quality Assessment<sup>16</sup> by Entran for further details.

## 3.4 Transport

### 3.4.1 Site location

The school will be surrounded by residential development to the north west and east. Adjacent the northern boundary is Brookleigh Avenue, of which accommodates 'green superhighway', a key pedestrian and cycle route that connects the site with the wider Brookleigh development.

Adjacent the west site boundary is Isaac's Lane, a single carriageway road extending approximately 4km between the B2036 Cuckfield Road / Fairbridge Way junction to the south of the site, and the roundabout with Tylers Green / B2272 Butlers Green Road, to the north of the site, within Haywards Heath.

### 3.4.2 Travel Plan

A Travel Plan has been developed by Campbell Reith to provide a long term management strategy for delivering sustainable transport objectives, that:

- Reduce the impacts of travel to and from the development.
- Increase awareness of the advantages and potential for travel by environmentally friendly modes.
- Reduce car usage; and
- Have no adverse effect on local parking and congestion on the streets within and surrounding the site.

Refer to the separate Travel Plan<sup>17</sup> by Campbell Reith for further details.

### 3.4.3 Pedestrian and cyclist infrastructure

Footways are proposed on both side of Brookleigh Avenue to encourage pedestrian access to the school entrance.

The 'green superhighway' proposed along the northern frontage of the site further promotes walking and cycling as realistic travel modes for parents, pupils, staff and visitors alike.

To the east of the site, there is the proposed 'green circle', which also links to the parcels of development within the wider Brookleigh development.

### 3.4.4 Public transport

Whilst the nearest two-way bus stops to the site are located approximately 1.2km south of the site, a bus service will be provided within the vicinity of the site in the future as the development progresses. This has been secured as part of the planning permission for the wider site.

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<sup>16</sup> Brookleigh Eastern Primary School, Brookleigh, Burgess Hill, Air Quality Assessment, Entran, October 2025

<sup>17</sup> Brookleigh Eastern Primary School, Burgess Hill, School Travel Plan, Campbell Reith, September 2025

Close' Bus Stops. These stops are currently served by the No. 33, 33A and 35A services (the latter of which is a school bus service) operated by Compass Travel, which provides regular weekday and week

#### 3.4.5 Vehicle access

Vehicular access from Isaac's Lane has been proposed for staff, visiting professionals and students that require specialist access. This access would also provide access for scheduled delivery and servicing requirements that the school may have as well as maintenance vehicles for the playing fields and a fire tender, should it be needed.

#### 3.4.6 Parking

Car parking is provided for full time staff and visitors only. There will be no drop off or pick up within the curtilage of the site unless in special, pre-agreed circumstances since parents, guardians and pupils are expected to walk or cycle.

Safe and secure long-stay cycle parking is proposed to encourage staff to cycle to the school as well as pupils.

#### 3.4.7 Electric vehicles

Opportunities for new, cleaner technology now and in the future will be implemented by way of providing electric vehicle charging points within car parking to facilitate a more rapid shift to the use of electrically driven, low emission vehicles.

### 3.5 Natural environment

#### 3.5.1 Biodiversity net gain

A Biodiversity Net Gain (BNG) report<sup>18</sup> has been prepared by TEP summarised below.

Trading Rules are satisfied for medium and low distinctive habitats by the proposed development and no high or very high distinctiveness habitats have been identified within the baseline or proposed post-development.

The baseline for the site was taken to be that as reported for the Outline Planning Application (OPA); namely 2.18ha modified grassland of poor condition. This reflects the position prior to the northern half of the site being utilised for a temporary site compound for nearby plots within Phase 1 of the Brookleigh development.

The OPA BNG assessment for this plot calculated a net loss of 2.10 habitat units (-43.4%) in isolation. The Design Stage BNG assessment recalculates a net gain of 0.09 habitat units, representing a gain of 1.98%. This represents a betterment in the detailed design equivalent to 1.62 habitat units.

Thus the proposals for the site are considered to conform with the BNG requirements for the Brookleigh BNG development

#### 3.5.2 Ecology

An Ecological Impact Assessment<sup>19</sup> has also been undertaken by TEP, which is summarised below.

The Site was assessed to be of low ecological value with only a regularly maintained species poor uniform sward of modified grassland to the south and temporary site compound (comprising bare ground ruderal/ephemeral vegetation and site cabins) to the north.

The grassland, which covered the whole of the site at the OPA stage, provides low value for terrestrial amphibians, reptiles, badger, foraging bats, ground-foraging birds, and hedgehog.

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<sup>18</sup> Brookleigh Eastern Primary School, Burgess Hill, Biodiversity Net Gain Design Stage Report, TEP, October 2025

<sup>19</sup> Brookleigh Eastern Primary School, Burgess Hill, Ecological Impact Assessment Report, TEP, October 2025

Construction phase effects are limited to risk of killing or injury during construction (as a result of entrapment) or temporary reversible disturbance. Construction phase effects are of site level significance.

Operational phase effects are limited to temporary reversible disturbance which are temporary reversible and of site level significance.

Primary avoidance and mitigation measures will be delivered through the production and implementation of a construction phase ecological precautionary working method statement and an operational phase sensitive lighting scheme.

Upon successful implementation of avoidance and mitigation measures, the proposed development would have a neutral residual impact on ecological features present.

#### 3.5.1 External lighting

External lighting will be provided, which whilst will contribute to local light spill, glare and sky glow, the overall impact is not considered significant given the likely baseline level throughout existing neighbouring residential areas.

#### 3.5.2 Cultural, architectural, and archaeological heritage

No known cultural or historical context which might influence the scheme exists.

#### 3.5.3 BREEAM

A client requirement is that a BREEAM 'Excellent' rating is achieved.

A pre assessment was undertaken at RIBA Stage 2 and subsequently reviewed during RIBA Stage 3 to ensure credits committed to remained achievable.

The current pre assessment targeted score is at 80.86 which corresponds to an 'Excellent' rating. As the design continues to develop the score will be adjusted accordingly however the 'Excellent' rating will be maintained.

The BREEAM credit tracker and associated pre-assessment report are in appendix C.

## **4.0 ENERGY HIERARCHY**

This section discusses how the energy hierarchy has been applied to the development to reduce energy demand and carbon emission as far as possible.

### **4.1 Performance standard**

Applicable standards, as discussed earlier, include:

- Building Regulations Approved Document Part L, which defines the calculation process for assessing carbon compliance
  - Proposals exceed compliance requirements
- Current MSDC Policy, which promotes carbon reduction but does not stipulate performance metrics beyond Part L compliance
  - Proposals exceed current Policy requirements
- Draft MSDC Policy, which introduces the Energy Hierarchy and performance improvements beyond Part L
  - Proposals have been developed in line with the draft Policy
- DFES Performance requirements, which stipulate net zero carbon in use.
  - Proposals meet this requirement
- BREEAM Excellent
  - Strategies achieve the requisite mandatory credits associated with compliance.

### **4.2 Regulated versus unregulated demand**

Building Regulations Part L defines the performance standard and process for calculating carbon emissions from buildings. It is associated with regulated energy demand which is the energy required by the buildings fixed building services that are used for conditioning and treatment. Examples would be energy used for heating, hot water and lighting.

Unregulated demands are often referred to as 'plug loads' and generally relate to small power and equipment, but also extends to lifts. Part L does include an allowance for unregulated demand which is normalised between the notional and actual building models.

Achieving a net zero result using Part L can therefore be considered as delivering net zero in use. Note however that the designer has no control whatsoever over how energy will be used in practice so it is appropriate to normalise such demands for compliance purposes.

### **4.3 Process**

The Energy hierarchy is the name given to the process of reducing energy demand before using efficient and renewable sources of generation. It is broken down into the Lean, Clean and Green stages.

#### **4.3.1 Be Lean**

Passive design measures include increasing envelope performance, using energy as efficiently as possible and recovering energy wherever possible.

#### **4.3.2 Be Clean**

This stage is generally associated with shared energy systems such as heat networks that exploit generation efficiency and diversity, at scale. There are no heat networks in the vicinity but the scheme will be future proofed for potential connection.

Though not strictly in the vein of Be Clean, the proposed installations will use a communal heating installation, incorporating electrically driven heat pumps, that will serve all parts of the school.

#### 4.3.3 Be Green

Renewable technology, which does include heat pumps, as well as other equipment such as solar photovoltaic systems, is assessed at the 'Be Green' stage of the energy hierarchy.

#### 4.4 Building modelling

Building performance modelling has been undertaken at each stage of the RIBA design stages completed thus far.

A completely new building model has been created within the IES Virtual Environment at RIBA3 / planning submission stage to reflect the building as currently designed.

**Figure 4.1 - Model extract - view from north**

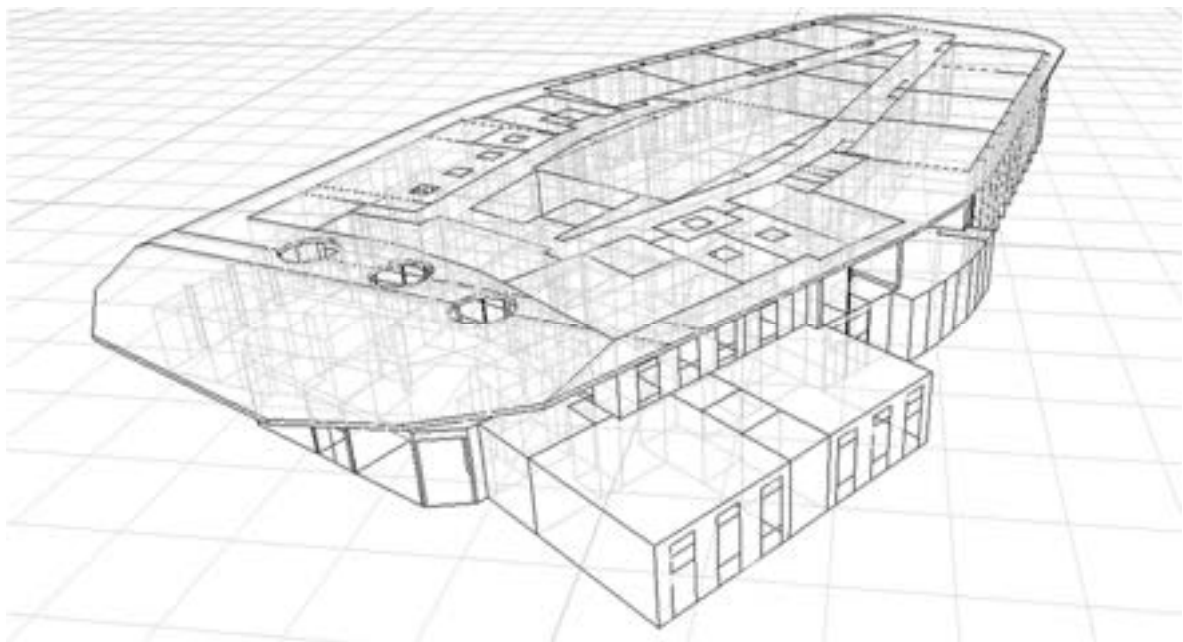
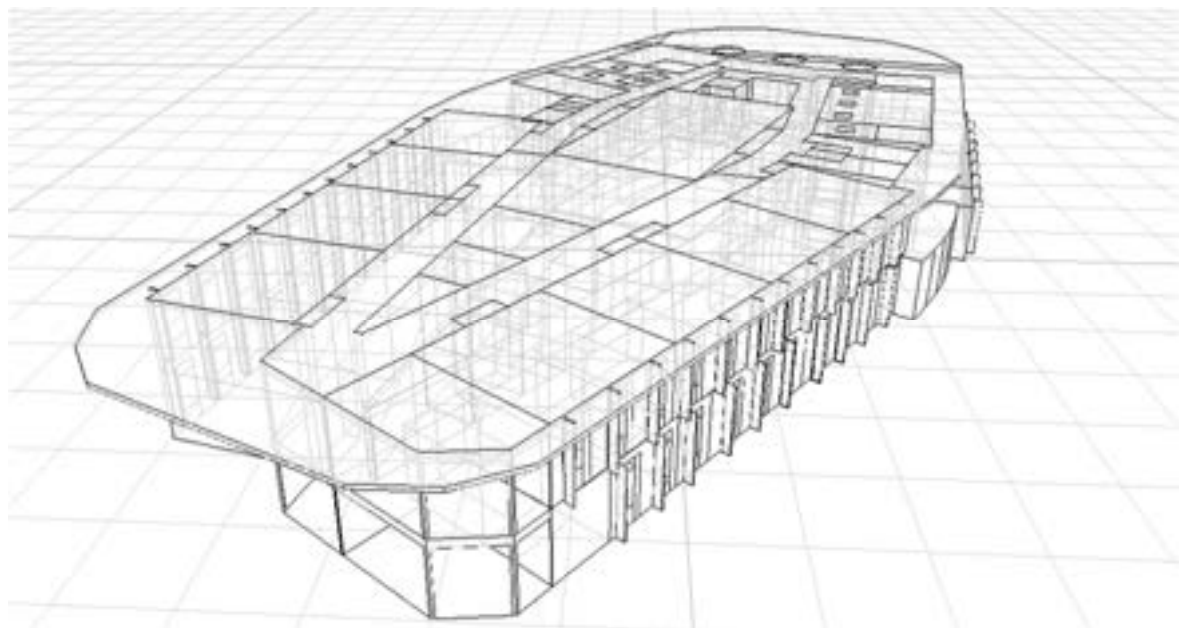


**Figure 4.2- Model extract – view from south**



#### 4.5 Fabric performance

Proposed fabric standards balance heat loss, air tightness, heat retention and heat gain, and air quality.

U values for each element, which meet DFE 'school output specification' target values, are set out in the table below alongside those used at earlier design stages and other design or compliance standards, including limiting values from Approved Document Part L<sup>20</sup>, LETI standards<sup>21</sup>, and a standard BREEAM ENE04 model.

**Table 4.1: Summary of fabric standards**

| Element                                                        | Part L limiting<br>(Table 4.1, ADL) | LETI<br>standards     | Ene04 standard<br>model | RIBA 2 model     | Current<br>proposal |
|----------------------------------------------------------------|-------------------------------------|-----------------------|-------------------------|------------------|---------------------|
| Walls (W/m <sup>2</sup> K)                                     | 0.26                                | 0.13-0.15             | 0.18                    | 0.17             | 0.15                |
| Floors(W/m <sup>2</sup> K)                                     | 0.18                                | 0.08-0.10             | 0.15                    | 0.12             | 0.12                |
| Roof(W/m <sup>2</sup> K)                                       | 0.16                                | 0.10-0.12             | 0.15                    | 0.12             | 0.12                |
| Window(W/m <sup>2</sup> K)                                     | U 1.60                              | U 1.00 /<br>G 0.5-0.6 | U 1.40 /<br>G 0.4       | U 1.1 /<br>G 0.4 | U 1.1 /<br>G 0.4    |
| Door(W/m <sup>2</sup> K)                                       | 1.60                                | 1.00                  | 1.60                    | 1.5              | 1.5                 |
| Air permeability<br>(m <sup>3</sup> /hr.m <sup>2</sup> @ 50Pa) | 8.0                                 | <1.0                  | 3.0                     | 3.0              | 3.0                 |

##### 4.5.1 Glazing proportions

Glazing has been included as per the architectural design. Further information is provided in the Cooling Hierarchy section of this document.

##### 4.5.2 Shading devices

External shading provisions have been included as per the architectural design. Further information is provided in the Cooling Hierarchy section of this document.

#### 4.6 Engineering services

Engineering services have been developed to deliver an all electric low energy, low temperature installation. Key elements are:

- Ground source heat pumps using vertical piles
- Low temperature wet heating system using radiators
- Dedicated hot water heat pump
- Mixed mode ventilation with air quality control
- High efficiency LED lighting throughout
- Solar photovoltaics

Further explanation is provided later in this document. A table of system parameters at each stage of the energy hierarchy is included below.

<sup>20</sup> The Building Regulations 2010, Conservation of fuel and power, Approved document L, Volume 1: dwellings, 2021 edition

<sup>21</sup> LETI Climate Emergency Design Guide, Path to zero carbon, London Energy Transformation Initiative, January 2020

**Table 4.2: System parameters at each stage of the energy hierarchy**

| <b>Model:</b>                          | <b>F2371TM1111A<br/>(Be Lean)</b> | <b>F2371TM1111B<br/>(Be Lean)</b> | <b>F2371TM1112<br/>(Be Clean)</b> | <b>F2371TM1113<br/>(Be Green)</b> |
|----------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Space Htg efficiency - GSHP / DX Split | 2.64                              | 2.64                              | 3.20                              | 3.20                              |
| Space Clg efficiency - DX Split        | 2.64                              | 2.64                              | 5.00                              | 5.00                              |
| Water htg efficiency - GSHP            | 2.86                              | 2.86                              | 3.20                              | 3.20                              |
| Vent SFP (W/[l/s]) - MVHR              | 1.1                               | 1.1                               | 1.1                               | 1.1                               |
| Vent SFP (W/[l/s]) - Extract           | 0.5                               | 0.5                               | 0.5                               | 0.5                               |
| Vent HR (%) - MVHR                     | 80                                | 80                                | 80                                | 80                                |
| Lighting efficacy (lm/W) - LED         | 80                                | 120                               | 120                               | 120                               |
| PV coverage (m2)                       | 0                                 | 0                                 | 0                                 | 482                               |

## 4.7 Building performance

### 4.7.1 Earlier analysis

Earlier analysis, and that used for demonstration of compliance with BREEAM metrics has included building form and orientation modelling, as well as earlier iterations of strategy and approach to energy generation.

A summary of iterative performance proving is demonstrated within the results table below. Analysis was undertaken on the level of information on relative to the stage, but the approach used has consistently evolved into what is presented within this strategy.

**Table 4.3: Carbon performance at earlier design stages (for information only)**

| <b>RIBA stage</b> | <b>Document</b>      | <b>Hierarchy stage</b> | <b>TER<br/>((kg.CO2)/<br/>m2/ann)</b> | <b>BER<br/>((kg.CO2)/<br/>m2/ann)</b> | <b>Improv'mnt</b> |
|-------------------|----------------------|------------------------|---------------------------------------|---------------------------------------|-------------------|
| RIBA 0            | TN001, February 2024 | All                    | 4.2                                   | 1.33                                  | 68%               |
| RIBA 1            | TN003, March 2024    | All                    | 4.2                                   | 1.33                                  | 68%               |
| RIBA 2            | TN006, December 2024 | Be Green               | 4.04                                  | 1.46                                  | 64%               |
| RIBA 2            | TN006, December 2024 | Net zero, theoretical  | 4.06                                  | 0.07                                  | 98%               |

Refer to the referenced technical notes for further information.

### 4.7.2 Current stage analysis

Building Regulations Part L calculations have been undertaken at each stage of the energy hierarchy using the fabric and systems parameters stated earlier. Associated BRUKL documents are included at appendix D.

A summary of performance at each stage of the energy hierarchy is included overleaf.

**Table 4.4: Performance at each stage of the energy hierarchy**

| Model        | Stage        | Key intervention                        | TER<br>((kg.CO2)/<br>m2/ann) | BER<br>((kg.CO2)/<br>m2/ann) | Improvement |         |
|--------------|--------------|-----------------------------------------|------------------------------|------------------------------|-------------|---------|
|              |              |                                         |                              |                              | Stage       | Overall |
| F2371TM1111A | Be Lean<br>A | Fabric standards and<br>GSHP            | 3.95                         | 3.71                         | 6%          | 6%      |
| F2371TM1111B | Be Lean<br>B | LED lighting (80 to<br>120 lm.cctWatt)  | 3.95                         | 3.49                         | 6%          | 12%     |
| F2371TM1112  | Be<br>Clean  | Heat pump efficiency<br>increased (3.2) | 3.95                         | 3.08                         | 12%         | 22%     |
| F2371TM1113  | Be<br>Green  | PV added.                               | 3.95                         | -0.13                        | 104%        | 103%    |

#### 4.8 Section summary

Analysis has proven the incremental improvements at each stage of the energy hierarchy with over 10% being achieved through the Be Lean step and culminating with predicted net zero carbon after all interventions have been considered.

Earlier predicted performance levels have been included to demonstrate how the team has considered and engrained carbon reduction into the buildings design and servicing strategy from outset.

## 5.0 PASSIVE DESIGN AND THE COOLING HIERARCHY

It is essential that passive design concepts are included and assessed from the earliest design stages. Concepts need not be ground breaking, they need not be well considered, as simple as possible, designed in conjunction with the services installation, and of course proven.

As with carbon analysis, a series of technical notes have been produced through the earlier design stages.

This section discusses how overheating risk has been reduced through the application of passive design principles.

### 5.1 The Cooling Hierarchy

Much like the Energy Hierarchy, the Cooling Hierarchy defines a series of iterative steps which aim to reduce overheating risk, thereby increasing occupant comfort, through a series of strategic interventions, before the introduction of mechanical ventilation and ultimately cooling.

The cooling hierarchy, and mitigations employed, is:

#### 5.1.1 Stage 1

*Reduce the amount of heat entering the building*

##### **Approach:**

The design team has worked to reduce the level of solar gain entering the building by using high efficiency glazing and external shading. A detailed assessment of the reduction in peak solar gain is included in the aforementioned technical note TN008 which was used to optimise external shading.

#### 5.1.2 Stage 2

*Minimise internal heat generation through energy efficient design:*

##### **Approach:**

A low temperature ground source based heating installation is proposed. Heating water will be circulated at much lower temperatures, around 45 degrees, to maximise the efficiency of the heat pumps and reduce circulation losses.

A domestic hot water return circuit will not be installed, instead a trace heating system will be used which will reduce domestic hot water heat loss by around 50%.

Extremely efficient LED lighting will be specified, to reduce heat emission to the space.

#### 5.1.3 Stage 3

*Manage the heat within the building through exposed internal thermal mass and high ceilings:*

##### **Approach:**

Thermal weight of the structure is limited by the chosen construction method, which has prioritised sustainable materials.

Floor to ceiling heights have been maximised and ceiling provision limited to promote stratification and exploit some passive heat exchange between air and the building.

#### 5.1.4 Stage 4

*Provide passive ventilation: For example, through the use of openable windows, shallow floorplates, dual aspect units or designing in the 'stack effect' where possible.*

**Approach:**

Detailed analysis of natural ventilation potential has been undertaken but it has proven insufficient in maintaining comfort conditions. A mixed mode ventilation approach has been developed which uses assisted extract stacks within the deeper plan portions of occupied spaces to promote air flow through the space, discharging at roof level.

Eart tubes are proposed for supply air to the main hall. These will achieve a degree of free cooling of supply air which will be delivered to the main hall at low level, where stack effect will take over to as warmer, vitiated air rises to high level to be exhaust through roof vents.

**5.1.5 Item 5**

*Provide mechanical ventilation: Mechanical ventilation can be used to make use of 'free cooling' where the outside air temperature is below that in the building during summer months.*

**Approach:**

Where required, extremely high efficiency zonal heat recovery units will be used for fresh air provision.

**5.1.6 Item 6**

*Provide active cooling systems.*

**Approach:**

Active cooling systems are not proposed.

**5.2 Evolution of the façade design**

Through earlier design stages, detailed analysis was undertaken on numerous façade designs to arrive at a solution which balances:

- Architectural intent
- Overheating and thermal comfort
- Acoustic performance
- Daylighting

Examples of designs that have been assessed are included overleaf.

**5.2.1 Iterative comfort assessment**

For each option differing opening configurations and control methodologies were assessed. FLOH technical note TN008 'RIBA 3 Interim thermal comfort assessment' included at appendix E presents some of that earlier analysis.

Detailed analysis undertaken at earlier design stages considered numerous variables. Earlier results were interesting and some key findings were:

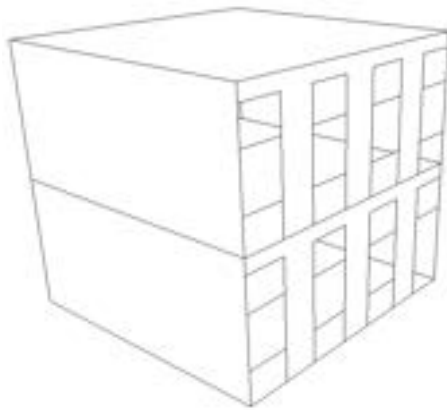
- Controlling on CO2 without temperature control was not effective since it held windows closed and allowed temperatures to rise.
- Adding temperature control to open windows when outdoor air is less than indoor air temperature served no benefit when combined with CO2 control only.
- Opening window control based on an internal temperature threshold of 25 degrees was ineffective as spaces had already heated up to much.
- Lowering the opening threshold to 22 degrees saw a significant reduction in overheating risk

- Using a hybrid approach of mechanical and natural ventilation improved performance considerably.

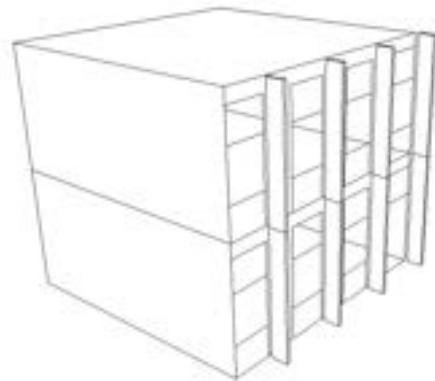
Like other design conundrums, the most beneficial outcome is often a balance of competing needs, such as:

- Improving fabric performance reduces space heating demand, but it increases heat retention in summer.
- When glazing proportions are optimised, there is a further reduction in heating demand. However, the reduction in daylight increases demand on lighting.
- Daylight is impacted further when external shading is introduced, demonstrated by an increase in lighting energy.
- Heating demand also increases as shading devices reduce beneficial heat gain during the heating season.

**Figure 5.1– Façade testing**



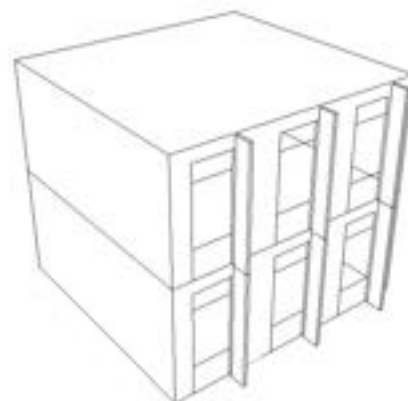
1. Standard façade (flat)



2. Vertical fins



3. Oriel



4. Three column, plus fins (final design)

### 5.2.2 Strategy at stage 3

A starting point for modelling at Stage 3, following earlier refinement and lessons learnt, was:

#### **Group 1 - For teaching spaces and others with external adjacency:**

- Openable windows
- Acoustic louvre – manual operation
- Acoustic louvre – automated operation for CO2 sensing and night purge
- Assisted extract stack, for mixed mode operation
- BMS control to allow automatic operation and optimisation

#### **Group 2 - For process and sensitive spaces:**

As group 1, with

- MVHR delivering approximately 4 ACH

#### **Group 3 – Main hall**

- Earth tube for air to ground heat exchange on make up
- Passive inlet
- High level exhaust, passive and assisted extract

#### **Group 4 – Dirty and process spaces**

- Zonal extract ventilation using heat recovery
- For kitchen only, dedicated supply AHU and separate extract

#### **Group 5 – Remote WC's**

- Local intermittent extract

### 5.2.3 Use of automation

Automated natural ventilation openings are notoriously problematic and cause nuisance for staff. Strategies employed provide both user control and automation, with automation via an acoustic louvre, in conjunction with the stack extract fan, to provide diffuse background ventilation.

### 5.3 Stage 3 assessment

#### 5.3.1 Requirement

Relevant design standards are described below.

#### 5.3.2 Building Regulations Part F<sup>22</sup>

Requirement F1(1), from ADF states:

- *“There shall be adequate means of ventilation provided for people in the building.”*

ADF makes no provision for ventilation with the specific aim of controlling or reducing the risk of summertime overheating in schools and instead refers to BB101<sup>23</sup>.

#### 5.3.3 Building Bulletin BB101

Building Bulletin 101 (BB101) provides guidance on ventilation, thermal comfort and indoor air quality in schools. It defines compliance requirements as:

- *“(DfE performance standards for teaching and learning spaces) must be followed if a school building is to comply with BB101.”*
- *“The designer should carry out an Overheating Risk Assessment (ORA) of free running designs by following the procedure set out in CIBSE TM52<sup>24</sup>.”*

#### 5.3.4 DfE Air quality standards

In addition to the general ventilation requirements of ADF, the DfE has set the following performance standards for teaching and learning spaces which ensure compliance with the Workplace Regulations.

In teaching and learning spaces served by mechanical ventilation:

- Sufficient outdoor air should be provided to achieve a daily average concentration of carbon dioxide (CO<sub>2</sub>) of less than 1000 ppm, during the occupied period, when the number of room occupants is equal to, or less than the design occupancy.
- The maximum concentration should also not exceed 1500 ppm for more than 20 consecutive minutes each day when the number of room occupants is equal to, or less than the design occupancy.

In naturally ventilated teaching and learning spaces:

- Sufficient outdoor air should be provided to achieve a daily average concentration of CO<sub>2</sub> of less than 1500 ppm, during the occupied period, when the number of room occupants is equal to, or less than the design occupancy.
- The maximum concentration should also not exceed 2000 ppm for more than 20 consecutive minutes each day, when the number of room occupants is equal to, or less than the design occupancy.
- Systems should be designed to achieve a carbon dioxide level for the majority of the time of less than:
  - 1200ppm (800ppm above outside air level) for a new building for the majority of the occupied time during the year.

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<sup>22</sup> Approved Document F: Ventilation, Volume 2: Buildings other than dwellings, 2021 Edition

<sup>23</sup> Building Bulletin 101, Guidelines on ventilation, thermal comfort and indoor air quality in schools, Version 1, August 2018, Education & Skills Funding Agency,

<sup>24</sup> CIBSE TM52: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings, CIBSE, 2013

- 1750ppm for a refurbished building (1350ppm above outside air level) for the majority of the occupied time during the year.

Ventilation systems should be designed to maintain CO<sub>2</sub> levels based on the maximum number of occupants the space accommodates.

In teaching and learning spaces, in the absence of any other major pollutants, carbon dioxide is the key indicator of ventilation performance for the control of indoor air quality.

#### 5.3.5 CIBSE TM52 analysis

CIBSE TM52 defines a methodology for the assessment of overheating risk within buildings. It outlines three assessment criteria, and any occupied space that fails two of the three criteria is classed as overheating.

The criteria are:

- Criterion 1: The number of hours that the operative temperature can exceed the threshold comfort temperature.
- Criterion 2: The severity of overheating within one day – this is a function of both temperature rise and its duration.
- Criterion 3: An absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

More detailed information associated with the above criteria is provided in the CIBSE TM52 document.

#### 5.3.6 Strategy at Brookleigh

Dynamic thermal simulation at Brookleigh has included both a CIBSE TM52 overheating assessment and an assessment of indoor air quality.

Following dynamic simulation, the TM52 module within modelling software generates a results report indicating which areas do not comply with two or more of the criteria above.

### 5.4 CIBSE TM52 and air quality assessment

#### 5.4.1 Approach

Dynamic thermal simulation has been undertaken using the IES Virtual Environment (IESVE) 2025 suite. Overheating risk has been assessed using the CIBSE TM52 methodology with additional analysis of air quality to ensure ventilation strategies are sound.

Given the extensive development and iterative assessment already undertaken, multiple models and results are not presented here. The Stage 3 model performed very well, though some further intervention has been required, which is discussed.

#### 5.4.2 Geometry

A version of the model created for carbon analysis has been modified for comfort and air quality analysis.

Building fabric standards, glazing, shading devices, engineering services systems and their operation are as defined in the earlier carbon assessment section.

#### 5.4.3 Profiles and set points

A series of tables are presented in the following pages which define individual settings for each space.

### Window opening profiles

- Where provided, manual acoustic louvres are controlled to be opened when internal air temperature reaches 20°C.
- Standard window casements in teaching spaces, whilst openable, are considered to be closed for acoustic reasons.
- Windows in other naturally ventilated spaces will be controlled to open when internal temperature is above 22°C, providing indoor air temperature is greater than outdoor temperature.
- Windows in other naturally ventilated spaces will also have a control override to open if indoor air quality reaches 1500ppm.
- Automated acoustic louvres in teaching spaces are controlled to work in tandem with the ventilation systems.
- Mechanical ventilation systems will be controlled to be available at all times. This will allow pre-conditioning, post conditioning, and night purge.

**Table 5.1: Occupancy profiles**

| Space type                    | Morning                           | Lunch          | Afternoon       |
|-------------------------------|-----------------------------------|----------------|-----------------|
| Staff room                    | 0800-1200, 30%,                   | 1200-1300, 80% | 1300-1700, 30%  |
| Head                          | 0800-1800, 100%                   |                |                 |
| Teaching                      | 0900-1200, 100%                   | 1200-1300, 0%  | 1300-1600, 100% |
| Reception                     | 0800-1700, 100%                   |                |                 |
| Main hall, studio and seating | 0900-1000, 100%<br>1000-1200, 25% | 1200-1300, 0%  | 1300-1600, 25%  |

**Table 5.2: Internal gains**

| Gain type              | Value (W.m <sup>-2</sup> ) | Profile         | Other/comment |
|------------------------|----------------------------|-----------------|---------------|
| Lighting               | 7.2                        | 0800-1800, 100% | No daylight   |
| Small power – general  | 5                          | 0800-1600, 100% |               |
| Small power – teaching | 10                         | 0800-1600, 100% |               |
| Small power – ICT      | 20                         | 0800-1600, 100% |               |
| Small power - offices  | 15                         | 0800-1600, 100% |               |
| Occupant adult         |                            | As occupancy    | S 70 , L - 55 |
| Occupant - child       |                            | As occupancy    | S 60 , L - 55 |

Ventilation rates are presented in the table overleaf, note the following:

- ‘ach’ denotes a mechanical ventilation system air change rate
- Unless followed by ‘NV’ which denotes a fixed natural ventilation rate (controlled by louvres)
- ‘O’ denotes natural ventilation
- ‘l/s’ denotes an assisted extract ventilation rate

**Table 5.3: Occupancy and ventilation rates**

| Room Name                        | Occ. Nr. | Rate      | Room Name                         | Occ. Nr. | Rate      |
|----------------------------------|----------|-----------|-----------------------------------|----------|-----------|
| 00_G001_NURSERY PLAYROOM         | 30       | 150l/s    | 00_G026_SSC STAFF WORK ROOM       | 4        | 4ach      |
| 00_G001_NURSERY PLAYROOM         | 30       | 150l/s    | 00_G029_STAFF WORK ROOM           | 4        | 4ach      |
| 00_G002_MEDICAL INSPECTION ROOM  | 2        | 4ach      | 00_G046_STUDIO HALL               | 64       | 1ach (NV) |
| 00_G003_RECEPTION CLASSROOM      | 33       | 150l/s    | 01_F001_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G004_RECEPTION CLASSROOM      | 33       | 150l/s    | 01_F002_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G005_KS1 CLASSROOM            | 32       | 150l/s    | 01_F003_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G006_KS1 CLASSROOM            | 32       | 150l/s    | 01_F004_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G007_KS1 CLASSROOM            | 32       | 150l/s    | 01_F005_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G008_KS1 CLASSROOM            | 32       | 150l/s    | 01_F006_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G009_SSC CLASSROOM            | 16       | 4ach      | 01_F007_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G010_SSC CLASSROOM            | 16       | 4ach      | 01_F008_KS2 CLASSROOM             | 32       | 150l/s    |
| 00_G011_SMALL ART CLASSROOM      | 16       | 150l/s    | 01_F009_SCIENCE ICT CLASSROOM     | 32       | 4ach      |
| 00_G012_MAIN HALL                | 124      | 1ach (NV) | 01_F010_LIBRARY                   | 16       | 4ach      |
| 00_G013_SMALL GROUP              | 2        | 4ach      | 01_F011_SEND RESOURCE BASE        | 2        | 0         |
| 00_G014_SMALL GROUP              | 2        | 4ach      | 01_F012_SMALL GROUP               | 4        | 4ach      |
| 00_G015_SMALL GROUP              | 4        | 0         | 01_F013_SMALL GROUP               | 4        | 0         |
| 00_G016_SENSORY ROOM             | 4        | 4ach      | 01_F014_LIFE SKILLS ROOM          | 4        | 4ach      |
| 00_G017_SSC RESOURCE BASE        | 4        | 4ach      | 01_F015_STAFF ROOM                | 6        | 0         |
| 00_G018_SMALL GROUP              | 4        | 4ach      | 01_F016_STAFF PPA ROOM            | 4        | 4ach      |
| 00_G019_QUIET SPACE              | 4        | 4ach      | 01_F017_HT OFFICE                 | 1        | 0         |
| 00_G020_GENERAL OFFICE RECEPTION | 4        | 4ach      | 01_F018_REPROGRAPHICS             | 4        | 4ach      |
| 00_G024_INTERVIEW ROOM           | 2        | 4ach      | 01_F050 AMPHITHEATRE STEP SEATING | 38       | 1ach (NV) |
| 00_G025_SICK BAY                 | 2        | 4ach      |                                   |          |           |

## 5.5 Results

An initial full building simulation showed positive results, with all teaching spaces meeting the comfort and air quality criteria. Five spaces failed two or more of the comfort criteria, or demonstrated poor air quality. These are set out within the table below together with interventions ahead of a further simulation, and are showing on the image which follows.

**Table 5.4: Spaces which did not meet performance standard after proving simulation**

| Space                             | Comfort | IAQ  | Intervention                                                                                                                                   |
|-----------------------------------|---------|------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 00_G013_SMALL GROUP               | FAIL    | FAIL | Mechanical ventilation introduced                                                                                                              |
| 00_G014_SMALL GROUP               | FAIL    | FAIL |                                                                                                                                                |
| 01_F011_SEND RESOURCE BASE        | PASS    | FAIL | Occupancy reduced from 4 to 2 during occupied hours.                                                                                           |
| 01_F015_STAFF ROOM                | PASS    | FAIL | Occupancy modelled incorrectly as 100% throughout the day. Profile changed to 6 occupants during lesson time, and full occupancy at lunchtime. |
| 01_F017_HT OFFICE                 | PASS    | FAIL | Occupancy profile hours extended, but number reduced to 1 at all times.                                                                        |
| 00_G046_STUDIO HALL               | PASS    | FAIL | Occupancy profile changed to 100% between 0900 and 1000 to reflect assembly, then 25% at all other times.                                      |
| 01_F050 AMPHITHEATRE STEP SEATING | PASS    | FAIL |                                                                                                                                                |

**Figure 5.2– Graphical representation of initially failing spaces (green – pass, red – fail)**



Changes described in table 5.4 were made to the engineering strategy or modelling parameters and a further simulation was undertaken which resulted in a full pass for the building. A summary of results is provided below.

**Table 5.5: Summary of TM52 analysis for entire building**

| Room Name                           | Criteria 1<br>(Hrs Top-<br>Tmax>=1K) | Criteria 2<br>(Max. Daily<br>Deg.Hrs) | Criteria 3<br>(Max.<br>DeltaT) | Criteria<br>failing |
|-------------------------------------|--------------------------------------|---------------------------------------|--------------------------------|---------------------|
| 00_G001_NURSERY PLAYROOM            | 11                                   | 6                                     | 2                              | -                   |
| 00_G001_NURSERY PLAYROOM            | 9                                    | 5                                     | 2                              | -                   |
| 00_G002_MEDICAL INSPECTION ROOM     | 0                                    | 0                                     | 0                              | -                   |
| 00_G003_RECEPTION CLASSROOM         | 17                                   | 6                                     | 2                              | -                   |
| 00_G004_RECEPTION CLASSROOM         | 19                                   | 7                                     | 3                              | 2                   |
| 00_G005_KS1 CLASSROOM               | 9                                    | 3                                     | 2                              | -                   |
| 00_G006_KS1 CLASSROOM               | 10                                   | 4                                     | 2                              | -                   |
| 00_G007_KS1 CLASSROOM               | 12                                   | 5                                     | 2                              | -                   |
| 00_G008_KS1 CLASSROOM               | 16                                   | 5                                     | 2                              | -                   |
| 00_G009_SSC CLASSROOM               | 0                                    | 0                                     | 0                              | -                   |
| 00_G010_SSC CLASSROOM               | 1                                    | 1                                     | 1                              | -                   |
| 00_G011_SMALL ART CLASSROOM         | 6                                    | 4                                     | 2                              | -                   |
| 00_G012_MAIN HALL                   | 0                                    | 0                                     | 0                              | -                   |
| 00_G013_SMALL GROUP                 | 2                                    | 2                                     | 1                              | -                   |
| 00_G014_SMALL GROUP                 | 0                                    | 0                                     | 0                              | -                   |
| 00_G015_SMALL GROUP                 | 0                                    | 0                                     | 0                              | -                   |
| 00_G016_SENSORY ROOM                | 0                                    | 0                                     | 0                              | -                   |
| 00_G017_SSC RESOURCE BASE           | 0                                    | 0                                     | 0                              | -                   |
| 00_G018_SMALL GROUP                 | 0                                    | 0                                     | 0                              | -                   |
| 00_G019_QUIET SPACE                 | 0                                    | 0                                     | 0                              | -                   |
| 00_G020_GENERAL OFFICE<br>RECEPTION | 0                                    | 0                                     | 0                              | -                   |
| 00_G024_INTERVIEW ROOM              | 0                                    | 0                                     | 0                              | -                   |
| 00_G025_SICK BAY                    | 0                                    | 0                                     | 0                              | -                   |
| 00_G026_SSC STAFF WORK ROOM         | 0                                    | 0                                     | 0                              | -                   |
| 00_G029_STAFF WORK ROOM             | 0                                    | 0                                     | 0                              | -                   |
| 00_G046_STUDIO HALL                 | 0                                    | 0                                     | 0                              | -                   |
| 01_F001_KS2 CLASSROOM               | 4                                    | 2                                     | 1                              | -                   |
| 01_F002_KS2 CLASSROOM               | 4                                    | 2                                     | 1                              | -                   |
| 01_F003_KS2 CLASSROOM               | 4                                    | 2                                     | 1                              | -                   |
| 01_F004_KS2 CLASSROOM               | 5                                    | 2                                     | 1                              | -                   |
| 01_F005_KS2 CLASSROOM               | 10                                   | 5                                     | 2                              | -                   |
| 01_F006_KS2 CLASSROOM               | 10                                   | 5                                     | 2                              | -                   |
| 01_F007_KS2 CLASSROOM               | 10                                   | 6                                     | 2                              | -                   |
| 01_F008_KS2 CLASSROOM               | 12                                   | 6                                     | 2                              | -                   |
| 01_F009_SCIENCE ICT CLASSROOM       | 3                                    | 2                                     | 1                              | -                   |
| 01_F010_LIBRARY                     | 0                                    | 0                                     | 0                              | -                   |
| 01_F011_SEND RESOURCE BASE          | 0                                    | 0                                     | 0                              | -                   |

| Room Name                         | Criteria 1<br>(Hrs Top-Tmax>=1K) | Criteria 2<br>(Max. Daily Deg.Hrs) | Criteria 3<br>(Max. DeltaT) | Criteria failing |
|-----------------------------------|----------------------------------|------------------------------------|-----------------------------|------------------|
| 01_F012_SMALL GROUP               | 0                                | 0                                  | 0                           | -                |
| 01_F013_SMALL GROUP               | 0                                | 0                                  | 0                           | -                |
| 01_F014_LIFE SKILLS ROOM          | 0                                | 0                                  | 0                           | -                |
| 01_F015_STAFF ROOM                | 0                                | 0                                  | 0                           | -                |
| 01_F016_STAFF PPA ROOM            | 0                                | 0                                  | 0                           | -                |
| 01_F017_HT OFFICE                 | 0                                | 0                                  | 0                           | -                |
| 01_F018_REPROGRAPHICS             | 0                                | 0                                  | 0                           | -                |
| 01_F050_AMPHITHEATRE STEP SEATING | 0                                | 0                                  | 0                           | -                |

## 5.6 Discussion

Detailed analysis undertaken at earlier stages gave due consideration to the balance between solar gain, daylighting and acoustic performance and ensured that the evolving strategy was sound. This was demonstrated in the limited number of interventions that were required when the full building model was simulated.

Only two spaces required changes to the intended services strategy and those were small group rooms. The team felt that whilst changes to occupancy profiles were justified in other spaces, these spaces were more likely to have prolonged periods of increased occupancy, hence mechanical ventilation would be more appropriate there.

Whilst analysis does not guarantee comfortable conditions will be experienced at all times and is entirely dependent on external weather conditions and how the building will be used, this normalised assessment has used an adopted framework to demonstrate compliance with BB101, via the TM52 assessment methodology.

## 6.0 ENGINEERING SERVICES STRATEGY

A summary of the key principles of the engineering services strategy is provided within this section. This should be read in conjunction with the following drawings, copies of which are located at appendix F:

**Table 6.1: Schedule of RIBA 2 drawn information included**

| Drawing reference            | Title                                                                                                                |
|------------------------------|----------------------------------------------------------------------------------------------------------------------|
| BPS-FLOH-SW-XX-DR-ME-40-0001 | Proposed incoming services strategy                                                                                  |
| BPS-FLOH-SW-XX-DR-ME-40-0002 | Proposed external services                                                                                           |
| BPS-FLOH-XX-XX-DR-M-PR-0001  | Mechanical engineering services, Proposed plant space strategy, Ground and first floor                               |
| BPS-FLOH-XX-XX-SC-M-PR-0001  | Mechanical engineering services, Concept plant strategy schematic                                                    |
| BPS-FLOH-XX-XX-DR-M-59-0001  | Mechanical engineering services, Distribution strategy, Ground and first floor                                       |
| BPS-FLOH-XX-XX-DR-E-69-0001  | Electrical engineering services, Distribution strategy, Ground and first floor                                       |
| BPS-FLOH-XX-XX-ETP-M-57-0001 | Mechanical engineering services, Environmental treatment plan, Emerging ventilation strategy, Ground and first floor |
| BPS-FLOH-XX-XX-DR-E-60-0002  | Electrical engineering services, Proposed PV installation strategy, Roof                                             |

### 6.1 Incoming services

- Incoming water will enter the site boundary from the east extended from new mains infrastructure being delivered as part of the wider Brookleigh development.
- A new substation located offsite within the adjacent housing development being delivered by others has been sized to provide capacity for the school. It is likely a new low voltage (LV) service will extend from the substation to serve the site.
- Ducts will be provided at two incoming locations for future fibre connections from access chambers at the site boundary. This will facilitate multiple telecoms providers to service the school and allow for diverse connections for resilience purposes.

### 6.2 Electrical energy

- An all-electric approach will be adopted using heat pumps as the core technology, supplemented by roof mounted solar photovoltaics.
- Battery storage might feature in the final strategy but not in so far as the facility being self-sufficient. Any battery provision will be appropriate based on need, cost and environmental impact.

### 6.3 Thermal energy

- Ground source heat pumps are proposed for thermal energy generation. A vertical loop system is preferred. Evolving proposals are based upon:
  - Closed loop ground system operating in the range 8°C flow (to ground) and 14°C return (to building).
  - Two low temperature heating system water to water heat pumps.
  - Two high temperature domestic hot water (DHWS) water to water heat pumps

- Vertical thermal piles (approximately 20No.) will be situated in the sports field, connected to a number of water to water based heat pumps serving both space heating and hot water generation systems.

#### **6.4 Space heating**

- Background heating will be provided by radiators operating with MWT of around 45 degrees, hence will be larger or deeper than standard radiators, but with the benefit of not needing to be LST specific.
- Opportunities for reverse cycle in summer for peak lopping (limited cooling) are being explored.

#### **6.5 Domestic water**

- Cold water will be delivered to outlets and appliances via a central boosted water system.
- Domestic hot water will be generated by dedicated high temperature heat pumps that will serve a central storage calorifier.
- Local point of use hot water heaters will serve remote parts of the building to avoid extensive pipe runs and associated circulation costs and increased risk of stagnation.
- Irrigation will not be provided to the sports pitch, field or MUGA.

#### **6.6 Ventilation**

- Wherever possible natural ventilation will be used, but in most parts mixed mode approaches have proven necessary.
- Teaching spaces will be naturally ventilated with assisted stack extract. Automated acoustic louvres will be used for fresh air inlet and will be coupled with a high level extract fan which will exhaust via a dedicated stack for each teaching space.
- SEN spaces will additionally have mechanical ventilation with heat recovery.
- General staff areas will adopt natural ventilation where they are on external walls.
- Internal occupied spaces will be mechanically ventilated using local or zonal heat recovery ventilation systems.
- Sanitary accommodation or any process spaces will have local extract only ventilation.
- A commercial ventilation system will be provided to the main kitchen, with low level intake and high level exhaust. Heat recovery is not proposed to this system.
- Extract will be provided from the Food science / DT technology classroom.
- Passive ventilation using low level inlets via earth tubes and high level exhaust via clerestory glazing will be used in the main hall and auditorium.

#### **6.7 Low voltage distribution**

- Within the building, LV sub-mains will emanate from a switch board to feed local distribution boards, control panels, fire alarm panel, disabled intercom system and PV system.
- Spatial allowance shall be made for future installation of voltage optimisation and power factor correction equipment to achieve a minimum power factor of 0.95.
- Small power services from local distribution boards will generally be provided by 13A switched sockets, fused connection units and double pole isolators installed in walls and surface mounted within plant areas generally.

#### **6.8 Lighting**

- High efficiency LED lighting throughout, with both presence and photocell control (subject to operational and sensitivity matters)
- In the event of a power failure to the building or lighting system, emergency lighting system will operate automatically to illuminate the means of escape and ensure the safety of occupants is not compromised.
- Building mounted external lighting will be provided. External lighting elsewhere will not.

## **6.9 Assistance systems**

- The following will be provided:
  - Disabled persons call system
  - Emergency voice communications system (EVCS)
  - Audio frequency induction loop systems (AFIL)

## **6.10 Electrical systems, generally**

- Specialist installations will include:
  - Data installations
  - AV Systems
  - Security systems including CCTV, intruder alarm, panic alarm and door access control
  - Fire alarm
  - Lightning protection
  - Electric vehicle charging

## **6.11 Plant space and distribution internally**

- At ground floor, the plant room to the east of the building will accommodate incoming services, water storage and distribution equipment and electrical switchgear.
- Directly above the incoming services plant room at ground floor lies a covered and screened plant compound at first floor. This area will accommodate heat pump plant associated with domestic hot water generation.
- On the western side of the building, at first floor, another covered and screened plant compound will house heat pump plant associated with space heating systems. The area is above the main kitchen and will also accommodate kitchen ventilation equipment.
- Piped and cable distribution generally will extend from plant spaces at high level along corridors, branching into areas served. Within teaching spaces it is likely services will be exposed at high level however this is subject to agreement with the wider design team.

## **6.12 Noise**

- Noise from plant, as measured in the locality of the nearest or most exposed noise-sensitive development, will be designed to be at least 5 dB lower than background throughout the day and night, in accordance with BREEAM Pol 05 requirements.
- This will be achieved through consideration to plant selection and associated attenuation.

## **7.0 CLOSE**

This energy and sustainability strategy is far reaching and touches many aspects of the proposed development, from considering the sustainability of the building, to assessing the minutia of parts per million of CO<sub>2</sub> within occupied spaces. The breadth and depth of the document should provide the reader with confidence in the teams approach to the very important energy, carbon, comfort and sustainability matters, and demonstrate how they have been addressed in a holistic manner.

A significant success is how the architectural design objective has been realised, whilst passive design principles have resulted in comfort conditions being demonstrated without the use of cooling, and that overall net zero carbon performance is achievable.

Further clarification can be provided on any matters if required.



## **APPENDIX A – CLIMATE ADAPTATION STRATEGY**



Contributors: FLOH Consulting - MEP and energy; Six Foot Studio - Architecture; Campbell Reith - Civils and structures

|                                                                                                                          |                                                                                                                                                                                                                                                                                       |                                                      |                                                                                         | Pre-Mitigation Risk Assessment            |                                            |                |                                                                  |                                                                                                                                                                                       | Post-Mitigation Risk Assessment           |                                            |                |                     |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site                                                                                                                                                                                                  | Hazard Impacts                                       | Risk presented and likely<br>impact                                                     | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                             | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K | Risks<br>Acceptable |
| Flooding                                                                                                                 | Flood water can ingress into built assets and cause damage to the building envelope, structure, building services equipment, fittings and furnishings and contents.                                                                                                                   | Structural stability                                 | Long-term undermining of structural integrity                                           | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Structural robustness                                |                                                                                         | 2                                         | 2                                          | 4              | Yes                                                              |                                                                                                                                                                                       | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Ensure weatherproofing details are preesent and correct                                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Material durability                                  |                                                                                         | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Health and safety of building occupants and others   | Health and safety of building occupants and others                                      | 1                                         | 3                                          | 3              | Yes                                                              | Unlikley as building will be evacuated / unoccupied in this event. However, drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Impacts on building contents and business continuity | Damage to building, Repair Costs, Loss of business, rising insurance, risk to life etc. | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
| Storms (including high winds)                                                                                            | Storm events present greater chance of structural damage to built assets and ingress of water from driving rain. Impacts can be significant ranging from risk to life, total structural failure or foundation damage to damaged fixings and façade elements and comfort of occupants. | Structural stability                                 | Long-term undermining of structural integrity                                           | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Structural robustness                                |                                                                                         | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Ensure weatherproofing details are preesent and correct                                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Material durability                                  | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Health and safety of building occupants and others   | Health and safety of building occupants and others                                      | 1                                         | 3                                          | 3              | Yes                                                              | Unlikley as building will be evacuated / unoccupied in this event. However, drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Impacts on building contents and business continuity | Damage to building, Repair Costs, Loss of business, rising insurance, risk to life etc. | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |



Contributors: FLOH Consulting - MEP and energy; Six Foot Studio - Architecture; Campbell Reith - Civils and structures

| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site                                                                                                                                                                                                                                                                                                | Hazard Impacts                                       | Risk presented and likely<br>impact                                                                              | Pre-Mitigation Risk Assessment            |                                            |                | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                                                                                                                                                                           | Post-Mitigation Risk Assessment           |                                            |                | Risks<br>Acceptable |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     |                                                      |                                                                                                                  | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F |                                                                  |                                                                                                                                                                                                                                                                                                                                     | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K |                     |
| Cold events                                                                                                              | Snow affects ingress/egress into building, some landscape surfaces may become dangerous when snow covered or when snow is melting.<br><br>Increased variability of blizzards and frost events.<br><br>Low temperatures can cause cold related stresses to built assets such as freezing pipes or the weathering of porous building materials through processes such as frost heave. | Structural stability                                 | Structural failure                                                                                               | 1                                         | 3                                          | 3              | Yes                                                              | The structural strength of the building to be designed the cope with snow loadings.                                                                                                                                                                                                                                                 | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     | Structural robustness                                |                                                                                                                  | 1                                         | 3                                          | 3              | Yes                                                              |                                                                                                                                                                                                                                                                                                                                     | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     | Weather proofing and detailing                       | Health and safety in public spaces when people are trying to access the building when landscape is snow covered. | 1                                         | 3                                          | 3              | Yes                                                              | Design for trip hazard avoidance, slip avoidance, avoidance of cold metal contact etc.                                                                                                                                                                                                                                              | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     | Material durability                                  | Stress cycle fixing failure. Water carrying pipework freeze and rupture.                                         | 1                                         | 3                                          | 3              | Yes                                                              | A CLT approach is being adopted offering a well insulated envelope to resist solar gain. Appropriate design of façade elements liable to thermal expansion to be undertaken. Services exposed to elements will be provided with sufficient means to avoid freezing, e.g. trace heating.                                             | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     | Health and safety of building occupants and others   | Discomfort and dissatisfaction from occupants due to cooler internal temperatures.                               | 2                                         | 2                                          | 4              | Yes                                                              | Well performing fabric and low levels of infiltration will ensure that heat within the building is retained during winter periods, thus reducing the demand on building services systems.<br><br>Heat losses will be assessed at recommended external ambient conditions to ensure plant is sized to meet peak winter temperatures. | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                     | Impacts on building contents and business continuity | Damage to building contents and services during colder weather, interrupting service.                            | 2                                         | 2                                          | 4              | Yes                                                              | Space heating systems will be controlled to activate beneath a setback temperature during extreme cold weather.<br><br>Externally located building services and distribution will be integrated with measures to avoid freezing, such as trace heating or defrost cycles.                                                           | 1                                         | 2                                          | 2              | Yes                 |

Contributors: FLOH Consulting - MEP and energy; Six Foot Studio - Architecture; Campbell Reith - Civils and structures

| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site                                                                                                                                                                                                                                                                                                                     | Hazard Impacts                                                | Risk presented and likely<br>impact                                                                                                                                                                                            | Pre-Mitigation Risk Assessment            |                                            |                |                                           | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Risk Reduction Measures to be Implemented | Post-Mitigation Risk Assessment            |                |                     |  |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|--|
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |                                                                                                                                                                                                                                | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F | Likelihood<br>1=Low<br>2=Medium<br>3=High |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K | Risks<br>Acceptable |  |
| Heat waves (including<br>temperature increases)                                                                          | High temperatures can cause heat<br>stress to building structures,<br>fixtures and fittings which can lead<br>to expansion and buckling.<br><br>Externally, subsidence can occur<br>due to soil shrinkage and<br>maintenance costs for landscaping<br>can increase.<br><br>Uncomfortable internal conditions<br>for building occupants leading to a<br>loss of concentration in educational<br>settings. | Structural stability                                          | Structural failure                                                                                                                                                                                                             | 1                                         | 2                                          | 2              | Yes                                       | Structural strength of the building to be designed the cope<br>with sudden increase in outdoor temperature and<br>fluctuations in humidity.                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                                         | 1                                          | 1              | Yes                 |  |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          | Structural<br>robustness                                      |                                                                                                                                                                                                                                | 1                                         | 2                                          | 2              | Yes                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                         | 1                                          | 1              | Yes                 |  |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          | Weather proofing<br>and detailing                             | Damage to floor finishes,<br>wall finishes, floor<br>insulation, wall structure                                                                                                                                                | 1                                         | 1                                          | 1              | Yes                                       | Consideration of green-spaces and water to reduce site<br>temperatures to lessen impact on structure and fabric.<br>Careful consideration of fenestration to ensure solar gains<br>minimised but daylight maintained.<br><br>Building elements with higher thermal mass will be<br>exposed to assist with cooling strategies.<br>Consideration given to rainwater reuse through localised<br>measures, e.g.water butts.                                                                                                                                                        | 1                                         | 1                                          | 1              | Yes                 |  |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          | Material durability                                           | Stress cycle fixing failure                                                                                                                                                                                                    | 2                                         | 2                                          | 4              | Yes                                       | CLT approach offers well insulated envelope to resist solar<br>gain.<br>Appropriate design of façade liable to thermal expansion to<br>be undertaken.                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                         | 1                                          | 1              | Yes                 |  |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          | Health and safety<br>of building<br>occupants and<br>others   | Discomfort to occupants, in<br>particular those more<br>sensitive to temperature<br>fluctuations.<br>Lethargy and fatigue with<br>adverse effects on the<br>cognitive performance,<br>behaviour and wellbeing of<br>occupants. | 3                                         | 2                                          | 6              | Yes                                       | Passive design measures assessed using dynamic<br>simulation analysis to ensure thermal comfort of<br>occupants.<br>Analysis will ultimately compare current and future weather<br>including scenarios representative of heat waves.<br>Building will be assessed using CIBSE TM52 and include<br>analysis with future weather data, with particular attention<br>given to teaching spaces and those with naturally ventilated<br>or mixed mode approaches.<br>Means to offer a degree of 'peak lopping' is possible using<br>thermal energy generation to operate in reverse. | 1                                         | 2                                          | 2              | Yes                 |  |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                          | Impacts on<br>building contents<br>and business<br>continuity | Heat-related discomfort<br>adversely affects job<br>performance and<br>productivity as well as<br>increases risk of staff and<br>pupil sickness, particularly<br>those which are vulnerable.                                   | 3                                         | 2                                          | 6              | Yes                                       | As well as undertaking analysis and implementing<br>measures outlined above, it will be prudent for the school to<br>educate staff and users in how to utilise the building and<br>systems effectively in the event of a heat wave to manage<br>indoor (and outdoor) environments.                                                                                                                                                                                                                                                                                             | 1                                         | 2                                          | 2              | Yes                 |  |



Contributors: FLOH Consulting - MEP and energy; Six Foot Studio - Architecture; Campbell Reith - Civils and structures

| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site                                                                                                                                                                                                                                  | Hazard Impacts                                                | Risk presented and likely<br>impact                                                                                                                                                          | Pre-Mitigation Risk Assessment            |                                            |                | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                                                                                                                                                                                                                                                               | Post-Mitigation Risk Assessment           |                                            |                | Risks<br>Acceptable |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       |                                                               |                                                                                                                                                                                              | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                         | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K |                     |
| Drought (including reduced<br>summer rainfall)                                                                           | Soil shrinkage resulting from<br>drought can increase the risk of<br>damage to underground<br>infrastructure such as burst water<br>pipes or damage to gas lines and<br>increase the risk of subsidence.<br><br>Stress on utilities infrastructure<br>imposed by a greater demand on<br>processes such as irrigation. | Structural stability                                          | Structural failure                                                                                                                                                                           | 1                                         | 2                                          | 2              | Yes                                                              | Structural strength of the building to be designed the cope<br>with sudden increase in outdoor temperature and<br>fluctuations in humidity. Heave and shrinkage measures to<br>be incorporated into foundation design to accommodate<br>clay heave/shrinkage that could occur within the zone of<br>influence of trees in the medium shrinkable clay substrate.                                                         | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       | Structural<br>robustness                                      |                                                                                                                                                                                              | 1                                         | 2                                          | 2              | Yes                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                         | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       | Weather proofing<br>and detailing                             | Damage to floor finishes,<br>wall finishes, floor<br>insulation, wall structure                                                                                                              | 1                                         | 1                                          | 1              | Yes                                                              | Consideration of green-spaces and water to reduce site<br>temperatures to lessen impact on structure and fabric.<br>Careful consideration of fenestration to ensure solar gains<br>minimised but daylight maintained.<br><br>Building elements with higher thermal mass will be<br>exposed to assist with cooling strategies.<br>Consideration given to rainwater reuse through localised<br>measures, e.g.water butts. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       | Material durability                                           | Stress cycle fixing failure                                                                                                                                                                  | 2                                         | 2                                          | 4              | Yes                                                              | A CLT approach is being adopted offering a well insulated<br>envelope to resist solar gain.<br><br>Appropriate design of façade elements liable to thermal<br>expansion to be undertaken.                                                                                                                                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       | Health and safety<br>of building<br>occupants and<br>others   | Insufficient water supply<br>could have an effect on the<br>day to day operation of the<br>school.                                                                                           | 1                                         | 2                                          | 2              | Yes                                                              | A tanked and boosted supply will be provided so water will<br>be stored on site to provide resilience in a drought event.<br>Sanitary fittings and leak detection devices should be<br>selected to minimise excessive water consumption.<br>The BREEAM water consumption credit will also be<br>targeted.                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                                                       | Impacts on<br>building contents<br>and business<br>continuity | Heat-related discomfort<br>adversely affects job<br>performance and<br>productivity as well as<br>increases risk of staff and<br>pupil sickness, particularly<br>those which are vulnerable. | 3                                         | 2                                          | 6              | Yes                                                              | As well as undertaking analysis and implementing<br>measures outlined above, it will be prudent for the school to<br>educate staff and users in how to utilise the building and<br>systems effectively in the event of a heat wave to manage<br>indoor (and outdoor) environments.                                                                                                                                      | 1                                         | 2                                          | 2              | Yes                 |



Contributors: FLOH Consulting - MEP and energy; Six Foot Studio - Architecture; Campbell Reith - Civils and structures

|                                                                                                                          |                                                                                                                                                                                                                                                                                       |                                                      |                                                                                         | Pre-Mitigation Risk Assessment            |                                            |                |                                                                  |                                                                                                                                                                                       | Post-Mitigation Risk Assessment           |                                            |                |                     |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site                                                                                                                                                                                                  | Hazard Impacts                                       | Risk presented and likely<br>impact                                                     | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                             | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K | Risks<br>Acceptable |
| Milder winters                                                                                                           |                                                                                                                                                                                                                                                                                       | Structural stability                                 | Long-term undermining of structural integrity                                           | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Structural robustness                                | Long-term undermining of structural robustness                                          | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Ensure weatherproofing details are preseent and correct                                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Material durability                                  | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Health and safety of building occupants and others   | Health and safety of building occupants and others                                      | 1                                         | 3                                          | 3              | Yes                                                              | Unlikley as building will be evacuated / unoccupied in this event. However, drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Impacts on building contents and business continuity | Damage to building, Repair Costs, Loss of business, rising insurance, risk to life etc. | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
| Wetter winter (including increased moisture and driving rain)                                                            | Storm events present greater chance of structural damage to built assets and ingress of water from driving rain. Impacts can be significant ranging from risk to life, total structural failure or foundation damage to damaged fixings and façade elements and comfort of occupants. | Structural stability                                 | Long-term undermining of structural integrity                                           | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Structural robustness                                | Long-term undermining of structural robustness                                          | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal partitions. Sacrificial sole plates where concrete plates cannot be cast.                                                   | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Ensure weatherproofing details are preseent and correct                                                                                                                               | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Material durability                                  | Damage to floor finishes, wall finishes, floor insulation, wall structure               | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Health and safety of building occupants and others   | Health and safety of building occupants and others                                      | 1                                         | 3                                          | 3              | Yes                                                              | Unlikley as building will be evacuated / unoccupied in this event. However, drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                                                                                                                                                                                                                       | Impacts on building contents and business continuity | Damage to building, Repair Costs, Loss of business, rising insurance, risk to life etc. | 2                                         | 2                                          | 4              | Yes                                                              | Drained thresholds linked to storm drainage system, Building and Access Levels, SUDs, materials used etc.                                                                             | 1                                         | 1                                          | 1              | Yes                 |



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| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site | Hazard Impacts                                       | Risk presented and likely<br>impact                                                                                                                                                                           | Pre-Mitigation Risk Assessment            |                                            |                | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Post-Mitigation Risk Assessment           |                                            |                | Risks<br>Acceptable |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
|                                                                                                                          |                                                                                      |                                                      |                                                                                                                                                                                                               | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K |                     |
| Warmer summers and<br>increased solar radiation                                                                          |                                                                                      | Structural stability                                 | Structural failure                                                                                                                                                                                            | 1                                         | 2                                          | 2              | Yes                                                              | Structural strength of the building to be designed the cope with sudden increase in outdoor temperature and fluctuations in humidity. Heave and shrinkage measures to be incorporated into foundation design to accommodate clay heave/shrinkage that could occur within the zone of influence of trees in the medium shrinkable clay substrate.                                                                                                                                                                      | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Structural robustness                                |                                                                                                                                                                                                               | 1                                         | 2                                          | 2              | Yes                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure                                                                                                                                     | 1                                         | 1                                          | 1              | Yes                                                              | Consideration of green-spaces and water to reduce site temperatures to lessen impact on structure and fabric. Careful consideration of fenestration to ensure solar gains minimised but daylight maintained. Building elements with higher thermal mass will be exposed to assist with cooling strategies. Consideration given to rainwater reuse through localised measures, e.g.water butts.                                                                                                                        | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Material durability                                  | Stress cycle fixing failure                                                                                                                                                                                   | 2                                         | 2                                          | 4              | Yes                                                              | A CLT approach is being adopted offering a well insulated envelope to resist solar gain. Appropriate design of façade elements liable to thermal expansion to be undertaken.                                                                                                                                                                                                                                                                                                                                          | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Health and safety of building occupants and others   | Discomfort to occupants, in particular those more sensitive to temperature fluctuations.<br><br>Lethargy and fatigue with adverse effects on the cognitive performance, behaviour and wellbeing of occupants. | 3                                         | 2                                          | 6              | Yes                                                              | Passive design measures assessed using dynamic simulation analysis to ensure thermal comfort of occupants. Analysis will ultimately compare current and future weather including scenarios representative of heat waves. Building will be assessed using CIBSE TM52 and include analysis with future weather data, with particular attention given to teaching spaces and those with naturally ventilated or mixed mode approaches. 'Peak lopping' is possible using thermal energy generation to operate in reverse. | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                      | Impacts on building contents and business continuity | Heat-related discomfort adversely affects productivity as well as increases risk of staff and pupil sickness, particularly those which are vulnerable.                                                        | 3                                         | 2                                          | 6              | Yes                                                              | As well as undertaking analysis and implementing measures outlined above, it will be prudent for the school to educate staff and users in how to utilise the building and systems effectively in the event of a heat wave to manage indoor (and outdoor) environments.                                                                                                                                                                                                                                                | 1                                         | 2                                          | 2              | Yes                 |

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|                                                                                                                          |                                                                                      |                                                      |                                                                                                                                                                                                               | Pre-Mitigation Risk Assessment            |                                            |                |                                                                  | Post-Mitigation Risk Assessment                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |                                            |                |                     |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site | Hazard Impacts                                       | Risk presented and likely<br>impact                                                                                                                                                                           | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                                                                                                                                                                                                                                                                          | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K | Risks<br>Acceptable |
| Temperature variations                                                                                                   |                                                                                      | Structural stability                                 | Structural failure                                                                                                                                                                                            | 1                                         | 2                                          | 2              | Yes                                                              | Structural strength of the building to be designed the cope with sudden increase in outdoor temperature and fluctuations in humidity.                                                                                                                                                                                                                                                                                              | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Structural robustness                                | Structural failure                                                                                                                                                                                            | 1                                         | 2                                          | 2              | Yes                                                              | Structural strength of the building to be designed the cope with sudden increase in outdoor temperature and fluctuations in humidity.                                                                                                                                                                                                                                                                                              | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Weather proofing and detailing                       | Damage to floor finishes, wall finishes, floor insulation, wall structure                                                                                                                                     | 1                                         | 1                                          | 1              | Yes                                                              | Consideration of green-spaces and water to reduce site temperatures to lessen impact on structure and fabric.<br><br>Careful consideration of fenestration to ensure solar gains are minimised but daylight maintained.<br><br>Building elements with higher thermal mass will be exposed to assist with cooling strategies.<br><br>Consideration will be given to rainwater reuse through localised measures such as water butts. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Material durability                                  | Stress cycle fixing failure                                                                                                                                                                                   | 2                                         | 2                                          | 4              | Yes                                                              | A CLT approach is being adopted offering a well insulated envelope to resist solar gain.<br><br>Appropriate design of façade elements liable to thermal expansion to be undertaken.                                                                                                                                                                                                                                                | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Health and safety of building occupants and others   | Discomfort to occupants, in particular those more sensitive to temperature fluctuations.<br><br>Lethargy and fatigue with adverse effects on the cognitive performance, behaviour and wellbeing of occupants. | 2                                         | 2                                          | 4              | Yes                                                              | Building services systems will be closely monitored and controlled to respond to fluctuations in external conditions.                                                                                                                                                                                                                                                                                                              | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                      | Impacts on building contents and business continuity | Heat-related discomfort adversely affects job performance and productivity as well as increases risk of staff and pupil sickness, particularly those which are vulnerable.                                    | 1                                         | 2                                          | 2              | Yes                                                              | As well as undertaking analysis and implementing measures outlined above, it will be prudent for the school to educate staff and users in how to utilise the building and systems effectively in the event of a heat wave to manage indoor (and outdoor) environments.                                                                                                                                                             | 1                                         | 2                                          | 2              | Yes                 |

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|                                                                                                                          |                                                                                      |                                                               |                                                                                                  | Pre-Mitigation Risk Assessment            |                                            |                |                                                                  |                                                                                                                                                                                                                                                                                                          | Post-Mitigation Risk Assessment           |                                            |                |                     |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------------------------|----------------|---------------------|
| Hazard Identification:<br>Extreme Weather Events<br>from Climate Change<br>Review of information from<br>relevant bodies | Hazard Assessment<br><br>Scale of the hazards identified, in<br>relation to the site | Hazard Impacts                                                | Risk presented and likely<br>impact                                                              | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=E x F | Mitigation<br>Required<br>Max Tolerable<br>Risk Threshold =<br>4 | Risk Reduction Measures to be Implemented                                                                                                                                                                                                                                                                | Likelihood<br>1=Low<br>2=Medium<br>3=High | Consequence<br>1=Low<br>2=Medium<br>3=High | RISK<br>=J x K | Risks<br>Acceptable |
| Precipitation, e.g. rain and<br>snow                                                                                     |                                                                                      | Structural stability                                          | Long-term undermining of<br>structural integrity                                                 | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal<br>partitions. Sacrificial sole plates where concrete plates<br>cannot be cast.<br><br>The structural strength of the building to be designed the<br>cope with snow loadings.                                                                  | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Structural<br>robustness                                      | Long-term undermining of<br>structural robustness                                                | 2                                         | 2                                          | 4              | Yes                                                              | Raised concrete plates to found all external and internal<br>partitions. Sacrificial sole plates where concrete plates<br>cannot be cast.<br><br>The structural strength of the building to be designed the<br>cope with snow loadings.                                                                  | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Weather proofing<br>and detailing                             | Damage to floor finishes,<br>wall finishes, floor<br>insulation, wall structure                  | 2                                         | 1                                          | 2              | Yes                                                              | Ensure weatherproofing details are preesent and correct                                                                                                                                                                                                                                                  | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Material durability                                           | Damage to floor finishes,<br>wall finishes, floor<br>insulation, wall structure                  | 2                                         | 1                                          | 2              | Yes                                                              | Drained thresholds linked to storm drainage system,<br>Building and Access Levels, SUDs, materials used etc.                                                                                                                                                                                             | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Health and safety<br>of building<br>occupants and<br>others   | Health and safety of<br>building occupants and<br>others                                         | 1                                         | 2                                          | 2              | Yes                                                              | Unlikley as building will be evacuated / unoccupied in this<br>event. However, drained thresholds linked to storm<br>drainage system, Building and Access Levels, SUDs,<br>materials used etc.                                                                                                           | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Impacts on<br>building contents<br>and business<br>continuity | Damage to building, Repair<br>Costs, Loss of business,<br>rising insurance, risk to life<br>etc. | 2                                         | 1                                          | 2              | Yes                                                              | Drained thresholds linked to storm drainage system,<br>Building and Access Levels, SUDs, materials used etc.                                                                                                                                                                                             | 1                                         | 1                                          | 1              | Yes                 |
| Subsidence or ground<br>movement                                                                                         | Increased risk of damage to<br>underground infrastructure                            | Structural stability                                          | Structural failure                                                                               | 1                                         | 2                                          | 2              | Yes                                                              | Structural strength of the building to be designed the cope<br>with ground movement. Heave and shrinkage measures to<br>be incorporated into foundation design to accommodate<br>clay heave/shrinkage that could occur within the zone of<br>influence of trees in the medium shrinkable clay substrate. | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Structural<br>robustness                                      |                                                                                                  | 1                                         | 2                                          | 2              | Yes                                                              |                                                                                                                                                                                                                                                                                                          | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Weather proofing<br>and detailing                             | Damage to floor finishes,<br>wall finishes, floor<br>insulation, wall structure                  | 2                                         | 1                                          | 2              | Yes                                                              | Ensure weatherproofing details are preesent and correct                                                                                                                                                                                                                                                  | 1                                         | 1                                          | 1              | Yes                 |
|                                                                                                                          |                                                                                      | Material durability                                           | Degradation of concrete<br>due to sulphate attack                                                | 2                                         | 2                                          | 4              | Yes                                                              | Suitable concrete mix to be specified for foundations and<br>ground floor slab                                                                                                                                                                                                                           | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                      | Health and safety<br>of building<br>occupants and<br>others   | Substructure failure                                                                             | 2                                         | 2                                          | 4              | Yes                                                              | Heave and shrinkage measures to be incorporated into<br>foundation design to accommodate clay heave/shrinkage<br>that could occur within the zone of influence of trees in the<br>medium shrinkable clay substrate. Suitable concrete mix<br>to be specified for foundations and ground floor slab.      | 1                                         | 2                                          | 2              | Yes                 |
|                                                                                                                          |                                                                                      | Impacts on<br>building contents<br>and business<br>continuity |                                                                                                  | 2                                         | 2                                          | 4              | Yes                                                              |                                                                                                                                                                                                                                                                                                          | 1                                         | 2                                          | 2              | Yes                 |



## **APPENDIX B – DESIGN FOR DISASSEMBLY AND ADAPTABILITY**

**BROOKLEIGH EASTERN PRIMARY SCHOOL,  
BROOKLEIGH, BURGESS HILL**

**DESIGN FOR DISASSEMBLY AND ADAPTABILITY**

Contributors:

Matthew Fowler, FLOH Consulting, MEP and energy

David Marshallsay, sixfootstudio, architect

Alex Forbes, CampbellReith, Civils and structures

**1.0 DESIGN FOR DISASSEMBLY**

Ease of disassembly is facilitated by principles allowing the building or parts of the building to be disassembled at the end of its life, or to be renovated rather than demolished, with individual components being used for other purposes. The outcome of this study is a set of recommendations involving the following considerations:

1. Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building.
2. Durability: Use materials which require less frequent maintenance, repair or replacement, considering them within the context of the life span of the building.
3. Exposed and reversible connections: Making the connections more visible provides opportunities to optimise material and product reuse. Welded connections prohibit disassembly and it is preferable to use screws and bolts to allow for disassembly and material reuse.
4. Layer independence: Designing building systems and components in layers so that removal, adjustment or replacement of some elements is feasible, especially when different components have different life spans and maintenance needs.
5. Avoidance of unnecessary toxic treatments and finishes: Some finishes can contaminate the substrate in a way that they are no longer reusable or recyclable. This should be avoided unless finishes serve a specific purpose.
6. Standardisation: Standardisation can accommodate reuse and upgrading involving aspects such as dimensions, components, connections and modularity.

| Ease of Disassembly Measures                                                                                              | RIBA Stage 3 design                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accessibility</b>                                                                                                      |                                                                                                                                                                                                                                                                                                                                                   |
| Panels in the floors/walls so that local plant/services can be removed without intrusive works.                           | <p>These will be included and coordinated with the services strategy throughout design development.</p> <p>Plant spaces have been identified on layouts and provisional plant layouts have been developed, taking into consideration both maintenance and plant replacement.</p> <p>Access to these areas will be via purpose made entrances.</p> |
| Use of suspended ceilings which enable services to be rerouted or removed without intrusive works.                        | <p>Services within service spines are surface-mounted behind either suspended ceilings or architectural/acoustic baffles. 'Last-mile' servicing within classrooms is envisaged to be concealed within plaster-boarded cavities, but could be easily accessed.</p> <p>A hybrid solution comprising dado-trunking is also being weighed.</p>        |
| Lifting Beams / Hoists to facilitate removing plant                                                                       | These will be included where required.                                                                                                                                                                                                                                                                                                            |
| Plant sized such that it can be manoeuvred through permanent openings i.e. doors, access hatches.                         | Where plant replacement relies on internal movements, access routes are being configured to facilitate transportation. However, major plant space is located with external frontages to facilitate replacement.                                                                                                                                   |
| Internal plant located on the perimeter with vehicular access to aid removal.                                             | Yes, with demountable screening where equipment is located on external plant decks.                                                                                                                                                                                                                                                               |
| <b>Exposed and reversible connections</b>                                                                                 |                                                                                                                                                                                                                                                                                                                                                   |
| Exposed and reversible connections are implemented to facilitate disassembly.                                             | Yes, generally, to support disassembly, screwed and bolted connections will be prioritised over adhesives or nails                                                                                                                                                                                                                                |
| Space availability between building elements has been considered to accommodate disassembly.                              | CLT system likely to be adopted is assembled on site using bolted connections to aid future demolition.                                                                                                                                                                                                                                           |
| Poured and welded connections have been avoided where possible to aid disassembly.                                        | <p>A CLT option utilises mainly bolted connections.</p> <p>Where higher strength connections are required, welded elements will be limited to fin, cap and end plates within bolted connections wherever possible.</p>                                                                                                                            |
| <b>Durability</b>                                                                                                         |                                                                                                                                                                                                                                                                                                                                                   |
| Building elements with a high degree of durability have been specified to reduce risk of being broken during disassembly. | Finishes will be in accordance with DfE Output Specification which are 'tried and tested' for durability.                                                                                                                                                                                                                                         |
| Building elements have been specified with consideration of the building life span.                                       | <p>Yes, as above.</p> <p>Specialist input on CLT will be sought throughout design development to ensure this.</p>                                                                                                                                                                                                                                 |

| Ease of Disassembly Measures                                                                                                       | RIBA Stage 3 design                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Layer independence</b>                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| The structural layer stands independently from the other layers.                                                                   | TBC on design development.                                                                                                                                                                                                                                                                                                                                                                                       |
| The building skin stands independently from the other layers.                                                                      | TBC on design development.                                                                                                                                                                                                                                                                                                                                                                                       |
| The building services stand independently from the other layers.                                                                   | In terms of distribution, yes, using exposed and reversible connections to the structure for supporting of services.                                                                                                                                                                                                                                                                                             |
| The space plan (interior layout) stands independently from the other layers.                                                       | Yes, save structural walls. We seek endlessly to avoid the imposition of structure with respect to flexibility.                                                                                                                                                                                                                                                                                                  |
| The furnishings and carpets stand independently from the other layers.                                                             | TBC on design development.                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Avoidance of unnecessary toxic treatments and finishes</b>                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Where possible toxic treatments and finishes have been avoided to aid recycling and reuse.                                         | CLT (the preferred superstructure) is untreated, so recycling is not inhibited in that way. However, a layer of fire protection is applied in areas that require it.                                                                                                                                                                                                                                             |
| <b>Standardisation</b>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Standard-size materials have been specified to accommodate multiple uses, reuse and upgrading.                                     | Classrooms are sized similarly to provide for flexibility in use. The principle building modules have been sized to a standard 1.8/3.6m grid to support the efficient use of sheet materials at standard sizes.                                                                                                                                                                                                  |
| Standard connection types have been specified which can be separated and reused more easily.                                       | Though subject to design development and specialist (CLT) review, the intention is certainly to standardise connection types.                                                                                                                                                                                                                                                                                    |
| Modularity has been used to allow elements to be slotted together or taken apart to promote disassembly and flexible environments. | Standardised teaching spaces are included throughout the building as described above.<br>Each has a standard glazing arrangement too, to ensure optimal thermal comfort and daylight performance.                                                                                                                                                                                                                |
| Terminal building services installations will be standardised throughout repeating areas such as teaching spaces.                  | Servicing provisions will be standardised throughout all general teaching spaces, comprising radiators for space heating, openable windows for natural ventilation and potentially a means of mechanical ventilation to assist natural approach.<br><br>Means of control too will be standardised.<br><br>Lighting will comprise standardised range of fittings, most likely sourced from a single manufacturer. |

## 2.0 DESIGN FOR FUNCTIONAL ADAPTABILITY

Recommendations, presented below, involved consideration of:

- Feasibility: The likelihood to contain multiple or alternative building uses, area functions and different tenancies over the expected life cycle.
- Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building.
- Versatility: The degree of adaptability of the internal environment to accommodate changes in working practices.
- Adaptability: The potential of the building ventilation strategy to adapt to future building occupant needs and climatic scenarios.
- Convertibility: The degree of adaptability of the internal physical space and external shell to accommodate changes of in-use.
- Expandability: The potential for the building to be extended, horizontally or vertically.
- Refurbishment potential: The potential for major refurbishment, including replacing the façade.

| Functional Adaptation Measures                                                                                                                                    | RIBA Stage 3 design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feasibility</b>                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The likelihood of different building uses, area functions and different tenancies has been considered in the structural design of the building.                   | Within the context of a continued but varied educational use, the building, through adherence to DfE 'standardised' room areas, types and numbers, can serve a range of educational needs. There is no reason why the building couldn't also fulfil the role of a community building, for which precedents could be cited.                                                                                                                                                                                                                                                                 |
| The likelihood of different building uses, area functions and different tenancies has been considered in the interior design of the building.                     | See above. Varied School modes of functionality and community access have been considered at this stage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| The likelihood of different building uses, area functions and different tenancies has been considered in the specification of building services for the building. | As school occupation is onerous from the perspective of building servicing and with future alternate capacities unlikely to exceed the design capacity for a school, this is a given.                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Accessibility</b>                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Use of fabric and structure products or systems which allow easy replacement.                                                                                     | <p>Building design has been developed to minimise the need for internal finishes and to provide for relative ease for replacement. Ceiling soffits are largely exposed. Structural walls are left exposed where possible.</p> <p>Services within corridors are surface-mounted.</p> <p>'Last-mile' servicing within classrooms is envisaged to be concealed within plaster-boarded cavities, but could be easily accessed. A hybrid solution comprising dado-trunking is also being weighed.</p>                                                                                           |
| Inclusion of facilities management requirements and construction design management feedback for future operational needs of building services.                    | Yes, a building wide BMS will be incorporated to allow facilities management to monitor performance or interrogate operational issues to then implement adjustments as required..                                                                                                                                                                                                                                                                                                                                                                                                          |
| Inclusion of interior design products or systems which allow easy access for replacement.                                                                         | <p>The building design has been developed to minimise the need for internal finishes and to provide for relative ease for replacement.</p> <p>Ceiling soffits are largely exposed.</p> <p>Structural walls are left exposed where possible.</p> <p>Services within service spines are surface-mounted behind either suspended ceilings or architectural/acoustic baffles. 'Last-mile' servicing within classrooms is envisaged to be concealed within plaster-boarded cavities, but could be easily accessed.</p> <p>A hybrid solution comprising dado-trunking is also being weighed.</p> |
| Use of suspended ceilings to allow easy access to building services.                                                                                              | Yes, see above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Service drops from roof void making rearrangement of services not intrusive                                                                                       | Yes, see above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Functional Adaptation Measures                                                                                                                   | RIBA Stage 3 design                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Panels in the floors/walls so that local plant/services can be removed without intrusive works                                                   | Yes, see above.                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Versatility and Convertibility</b>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                               |
| Open plan areas available to become cellular                                                                                                     | There are only three open-plan areas within the building: the studio Hall, the Library and a small, open-plan group learning space. All three could be enclosed.                                                                                                                                                                                                                              |
| Use of lightweight flexible partition systems that are easily deconstructed to enable reconfiguration without major works                        | Where possible, though these will be few in number. CLT partitions will mostly be load-bearing. However the CLT partitions will be designed to incorporate sufficient structural redundancy to enable apertures to be formed to interconnect spaces if need be.                                                                                                                               |
| Use of suspended ceilings to enable services to be rerouted                                                                                      | Ceiling soffits are largely exposed. Structural walls are left exposed where possible. Services within service spines are surface-mounted behind either suspended ceilings or architectural/acoustic baffles.                                                                                                                                                                                 |
| Layout the interior design in standardised grids.                                                                                                | Yes, though these will be minimal as most ceilings will be exposed. In terms of partition arrangement, these are situated according to DfE standards e.g. fixed 7.2m depth x 3.6m incremental length.                                                                                                                                                                                         |
| Use of inherent natural interior design finishes to allow replacement.                                                                           | Yes, the building design has been developed to minimise the need for internal finishes and capitalise upon the established educational and health-beneficial advantages that CLT confers.                                                                                                                                                                                                     |
| Use of standardised sizes for interior design material.                                                                                          | Yes, wherever necessary though these will be minimal                                                                                                                                                                                                                                                                                                                                          |
| Identifying or recognising potential future functional requirements when specifying interior design finishes.                                    | Finishes will be in accordance with DfE Output Specification which are 'tried and tested' for durability.                                                                                                                                                                                                                                                                                     |
| Modular plant so individual sections can be removed or repaired as required                                                                      | Modular plant is currently proposed to ensure systems have redundancy.                                                                                                                                                                                                                                                                                                                        |
| <b>Adaptability</b>                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                               |
| Suitable floor load allowances to cater for changes in use.                                                                                      | The design imposed loadings will be in line with the relevant Eurocode guidance for schools. Due to the magnitude of imposed loading required, some future change of use can be accommodated. As school occupation is onerous from the perspective of building loading and with future alternate capacities practically challenging to exceed, this should be 'built-in' to a greater degree. |
| Means of isolation within building services distribution systems to facilitate localised modification works without disrupting the wider system. | Isolation points will be generally located in corridors prior to entering spaces served, where they can be readily accessed.                                                                                                                                                                                                                                                                  |

| Functional Adaptation Measures                                                                                                     | RIBA Stage 3 design                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infrastructure provided to increase electric vehicle charging provision to meet future requirements of building users.             | Yes, ducting will be installed to permit additional charge points in future.                                                                                                                                                                                                                                                                                                                             |
| <b>Expandability</b>                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                          |
| Provision to add extensions or alterations to increase building capacity.                                                          | Yes. Although the proposed building is contained at capacity within the north-eastern site parcel, it could sustain a significant extension to the south which could adjoin in the vicinity of the designed southern stair core. This would be an efficient extension strategy in that the physical connection to the existing would be limited, minimising the need to 'disturb' the existing building. |
| Structural design to allow for additional floors.                                                                                  | Yes, this is possible, though the roof would need to be removed / replaced.                                                                                                                                                                                                                                                                                                                              |
| Structural design to allow for mezzanine level expansion.                                                                          | Not applicable.                                                                                                                                                                                                                                                                                                                                                                                          |
| Provision of capacity in building services and infrastructure to enable future expansion.                                          | Yes, use of a central thermal energy generation system rather than individual installations which can accept additional and varying heating and hot water demands.                                                                                                                                                                                                                                       |
| Power connections allow for additional capacity without intrusive works                                                            | Where possible, electrical installations will be configured to accommodate an extent of additional supply should this be required in future. However, should the supply required exceed provision then intrusive works may be necessary.                                                                                                                                                                 |
| Data connections to allow for additional capacity without intrusive works                                                          | Where possible, data installations will have potential for extension to suit perspective expansion of the building.                                                                                                                                                                                                                                                                                      |
| Water connections to allow for additional capacity without intrusive works                                                         | Where possible, yes, in terms of water storage tanks being modular and thus extendable.                                                                                                                                                                                                                                                                                                                  |
| Drainage connections to allow for additional capacity without intrusive works                                                      | An allowance for increased flows due to climate change has been made within the SW drainage network                                                                                                                                                                                                                                                                                                      |
| Cladding with an appropriate installation sequence to allow for any extension from the proposals without excessive deconstruction. | Yes. Although the proposed building is contained at capacity within the north-eastern site parcel, it could sustain a significant extension to the south which could adjoin in the vicinity of the designed southern stair core. This would be an efficient extension strategy in that the physical connection to the existing would be limited, minimising the need to 'disturb' the existing building. |
| Identifying or recognising potential future expansions when specifying interior design finishes.                                   | Yes                                                                                                                                                                                                                                                                                                                                                                                                      |
| Efficient use of space when designing the interior of the building to allow for any future increases in occupancy.                 | No. School buildings are, by their nature, high-capacity buildings. Future alternate uses are likely to correspond to the maintenance of or reduction from the design capacity.                                                                                                                                                                                                                          |

| Functional Adaptation Measures                                                    | RIBA Stage 3 design                                                                                                          |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Refurbishment potential                                                           |                                                                                                                              |
| Slab to accommodate access equipment for high level refurbishment                 | A reinforced concrete floor slab is proposed and can be designed to accommodate the loading applied from small access plant. |
| Steel frame minimising internal loadbearing elements.                             | CLT proposed with column and wall spacing to suit building use. Columns minimised by utilising clear span beams.             |
| Cladding able to be removed without affecting structural integrity                | Yes                                                                                                                          |
| Space around building to allow access for future changes/refurbishment activities | Yes, but expansion potential only to the south as described above.                                                           |



## **APPENDIX C – BREEAM PRE ASSESSMENT CREDIT SUMMARY**

# Brookleigh Primary School

BREEAM Credit Summary 10/06/2025 - Stage 3

Consultant Name - AES Sustainability Consultants

BREEAM New Construction V6.1

Tel: 01884 242 050  
Fax: 01884 235 078  
www.aessc.co.uk  
info@aessc.co.uk



|           | Required Score | Targeted Score | Potential Score |
|-----------|----------------|----------------|-----------------|
| Excellent | 70.00          | 80.86          | 95.88           |

| MANAGEMENT - 1 credit = 0.52%                     |                                                                                             |           |          |           |                                        |                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------|---------------------------------------------------------------------------------------------|-----------|----------|-----------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   |                                                                                             | Available | Targeted | Potential | Responsible Party                      | Comments                                                                                                                                                                                                                                                                                                                                                                                             |
| Man 01: Project brief and design                  | Project delivery planning                                                                   | 1         | 1        |           | Client                                 | Meeting of project delivery stakeholders prior to completion of concept design to identify/define roles, responsibilities and contributions. Compliance will be demonstrated through meeting minutes and responsibilities matrix. Project directory and DTM minutes received. Responsibility Matrix received however template updated, re-issued 19/05/25 and 10/05/2025.                            |
|                                                   | Stakeholder consultation                                                                    | 1         | 1        |           | Client                                 | Third party stakeholder consultation documentation evidencing public engagement and early stage discussions/ feedback from interested parties. DTMs with council received but minimum consultation content not covered. Stace have issued masterplan statement of community consultation, CC to review against criteria 10/06.                                                                       |
|                                                   | Prereq: Sustainability Targets                                                              | 0         | Yes      |           | Client                                 | BREEAM targets have been formally agreed early in early design process. Evidence received.                                                                                                                                                                                                                                                                                                           |
|                                                   | BREEAM AP Concept Design                                                                    | 1         | 1        |           | Client / Sustainability Consultant     | AES appointment for pre-assessment covers this.                                                                                                                                                                                                                                                                                                                                                      |
|                                                   | BREEAM AP Developed Design                                                                  | 1         | 1        |           | Client / Sustainability Consultant     | Continued appointment with AES, or another qualified BREEAM AP, would meet compliance.                                                                                                                                                                                                                                                                                                               |
| Man 02: Life cycle cost and service life planning | Elemental LCC                                                                               | 2         | 2        |           | Client                                 | Entire asset LCC plan at Concept Design stage with design options appraisal received.                                                                                                                                                                                                                                                                                                                |
|                                                   | Component LCC options                                                                       | 1         | 1        |           | Contractor                             | LCC options appraisal by the end of technical design.                                                                                                                                                                                                                                                                                                                                                |
|                                                   | Capital cost reporting                                                                      | 1         | 1        |           | Contractor                             | Contractor will report capital cost.                                                                                                                                                                                                                                                                                                                                                                 |
| Man 03: Responsible construction practices        | Prereq: Legal & sustainable timber                                                          | 0         | Yes      |           | Contractor                             | Contractor will prove the use of legal and sustainable timber.                                                                                                                                                                                                                                                                                                                                       |
|                                                   | Environmental Management                                                                    | 1         | 1        |           | Contractor                             | Selected contractor will be required to hold ISO14001 and adhere to PPG6 guidelines.                                                                                                                                                                                                                                                                                                                 |
|                                                   | Prereq: Sustainability Targets                                                              | 0         | Yes      |           | Client / Contractor                    | The client and contractor will formally agree the BREEAM rating.                                                                                                                                                                                                                                                                                                                                     |
|                                                   | BREEAM AP Construction                                                                      | 1         | 1        |           | Contractor / Sustainability Consultant | Continued appointment with AES, or another qualified BREEAM AP, would meet compliance.                                                                                                                                                                                                                                                                                                               |
|                                                   | Responsible construction management<br>BREEAM Excellent Rating Minimum Standard             | 2         | 2        |           | Contractor                             | Contractor required to manage site responsibly. CCS compliance commonly used to aid compliance. Contractor to comply with CCS with an overall score of 35 and a minimum of 11 points per section. To achieve the exemplary credit, an overall score of 39 with 13 points per section. Additional points G, P and Q in Table 4.1 of the BREEAM manual must also be met for compliance when using CCS. |
|                                                   | Monitoring of utility consumption                                                           | 1         | 1        |           | Contractor                             | Contractor required to monitor energy and water use throughout construction. Targets will need to be set for site energy consumption in kWh. Targets will need to be set for water consumption in litres.                                                                                                                                                                                            |
|                                                   | Transport of materials and waste                                                            | 1         | 1        |           | Contractor                             | Contractor required to monitor vehicle mileage for delivery of key materials and waste collection.                                                                                                                                                                                                                                                                                                   |
| Man 04: Commissioning and handover                | Commissioning schedule and responsibilities<br>BREEAM Excellent Rating Minimum Standard     | 1         | 1        |           | M&E                                    | Schedule for commissioning and testing with appropriate standards and specific procedures for commissioning of BMS.                                                                                                                                                                                                                                                                                  |
|                                                   | Commissioning design and preparation                                                        | 1         | 1        |           | M&E                                    | Commissioning manager to be appointed to undertake design reviews, commissioning management input e.g. programming and management of the commissioning and testing. For complex systems a specialist commissioning manager.                                                                                                                                                                          |
|                                                   | Testing and inspecting building fabric                                                      | 1         | 1        |           | Contractor                             | Pre completion thermographic survey and air test and any required remedial works completed prior to hand over.                                                                                                                                                                                                                                                                                       |
|                                                   | Building user guide and training<br>BREEAM Excellent Rating Minimum Standard (Criterion 11) | 1         | 1        |           | Contractor                             | A building user guide will be required for non-technical users and for facilities managers. Training should also be provided for each of the above around handover, compliance is demonstrated through the provision of two training schedules                                                                                                                                                       |
| Man 05: Aftercare                                 | Aftercare support                                                                           | 1         | 1        |           | Contractor                             | Aftercare support to include: meeting between aftercare and building management prior to occupation to introduce the building user guide and present key building information and training for facilities management including a walkabout.                                                                                                                                                          |
|                                                   | Commissioning implementation<br>BREEAM Excellent Rating Minimum Standard                    | 1         | 1        |           | M&E                                    | Commissioning activities over a 12 month period including testing under full load conditions, interviews with building occupants, monthly reports comparing sub metered energy performance against predicted, recommissioning.                                                                                                                                                                       |
|                                                   | Post occupancy evaluation                                                                   | 1         | 0        | 1         | Developer                              | A Post Occupancy Evaluation would be required to be carried out 12 months after occupancy, demonstration of the allocated budget would be required.                                                                                                                                                                                                                                                  |
|                                                   |                                                                                             | 21        | 20       | 1         |                                        |                                                                                                                                                                                                                                                                                                                                                                                                      |
| HEALTH AND WELLBEING - 1 credit = 0.78%           |                                                                                             |           |          |           |                                        |                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                   |                                                                                             | Available | Targeted | Potential | Responsible Party                      | Comments                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                   | Control of glare from sunlight                                                              | 1         | 1        |           | Architect                              | Glare Control assessment required to identify areas of the building at risk of glare. Where risk is identified, a glare control strategy is used to design out the potential for glare e.g. blinds.                                                                                                                                                                                                  |

|                                     |                                                           |    |    |     |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----------------------------------------------------------|----|----|-----|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hea 01: Visual comfort              | Daylighting                                               | 2  | 2  |     | Sustainability Consultant | Daylighting report would be required demonstrating the BREEAM Daylighting criteria has been met. As a minimum 80% of the building floor area to meet average daylight factor of 2%. Uniformity ratio of at least 0.3. Or, a minimum point daylight factor of at least 0.3 times the relevant average daylight factor value. Architect MT confirmed in initial PA meeting Daylight modelling is taking place. Credit moved from potential to target following meeting 10/06.                                                                                                                                       |
|                                     | View out                                                  | 1  | 1  |     | Architect                 | View Out calculations required to confirm that 95% of the floor areas in 95% of occupied spaces (where close work will be undertaken) will have an adequate view out. Adequate view out is defined as being within 8m of an external wall, with a window that is more than 20% of the surrounding wall areas. Where room depth is greater than 8m, an opening greater than the values in Table 1.0 BS 8206 Part 2 is required. Example issued 10/06.                                                                                                                                                              |
|                                     | Internal and external lighting levels, zoning and control | 1  | 1  |     | M&E                       | Internal lighting in line with SLL Code for Lighting 2012 and any other relevant standard. CIBSE LG 7 for areas where computer screens used regularly. External lighting in line with BS5489-1:2013 and BS EN12464-2:2014.<br><br>Internal lighting to be zoned for occupant control including<br>- Teaching/ whiteboard space separately zoned to classroom seating.<br>- Dining, restaurant, café areas: separate zoning of servery and seating or dining areas<br>- Workstations adjacent to windows separately zoned and controlled<br>- Library spaces: separate zoning of stacks, reading and counter areas |
| Hea 02: Indoor air quality          | Prerequisite: IAQ plan                                    | 0  | No | Yes | M&E                       | Indoor air quality plan would be required as a prerequisite to the Hea 02 credits. Not currently targeted as other Hea02 credits are not targeted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                     | Ventilation                                               | 1  | 0  | 1   | M&E                       | M&E to review criteria based on system specified - natural/ mechanical/ mixed system. Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building. (intakes and exhausts 10m horizontal distance apart / intakes 10m from source of pollution for mixed/mechanical - or in accordance with a relevant standard listed in the ventilation methodology). FLOH MF confirming that natural ventilation is to be prioritised however ventilation strategy is yet to be fully developed. Credit to be monitored as design progresses. Criteria issued 10/06.           |
|                                     | Emissions from Construction Products                      | 2  | 0  | 2   |                           | Products would need to be selected to meet strict emission limits (VOC, carcinogenic etc.) and testing requirements for three of the following: interior paints and coatings, wood based products, flooring materials, insulation materials and interior adhesives and sealants. Two credits will be achieved where all are met. Criteria issued 10/06.                                                                                                                                                                                                                                                           |
|                                     | Post Construction indoor air quality                      | 1  | 0  | 1   |                           | Pre-occupancy air testing for formaldehyde and total volatile organic compound (TVOC) concentration would need to be undertaken at post construction. Measures undertaken to reduce the levels may be required.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Hea 04: Thermal comfort             | Thermal modelling                                         | 1  | 1  |     | M&E                       | Thermal comfort report required confirming occupied spaces are in accordance with criteria set out in CIBSE Guide A Table 1.5. PPD and PMV figures to be reported.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                     | Design for future thermal comfort                         | 1  | 1  |     | M&E                       | Thermal comfort modelling for future climate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                     | Thermal zoning and controls                               | 1  | 1  |     | M&E                       | Thermal modelling analysis must inform the temperature control strategy.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Hea 05: Acoustic performance        | Sound insulation                                          | 1  | 1  |     | Acoustician               | Acoustician will need to be appointed to complete testing of sound insulation to meet performance standards set out in Section 1 of Building Bulletin 93: Acoustic design of schools: performance standards, or other standards deemed appropriate by the acoustician.                                                                                                                                                                                                                                                                                                                                            |
|                                     | Indoor ambient noise level                                | 1  | 1  |     | Acoustician               | Acoustician will need to be appointed to complete testing of indoor ambient noise levels to meet Section 1 of BB93 for all room types, or other standards deemed appropriate by the acoustician.                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                     | Room acoustics                                            | 1  | 1  |     | Acoustician               | Acoustician will need to be appointment to complete testing of sound absorption and reverberation to meet Section 1 of BB93 for all room types, or other standards deemed appropriate by the acoustician.                                                                                                                                                                                                                                                                                                                                                                                                         |
| Hea 06: Security                    | Security of site and building                             | 1  | 1  |     | Architect                 | A Suitably Qualified Security Specialist (SQSS) conducts a Security needs assessment (SNA) during or prior to Concept Design. Any security controls and recommendations given within the SNA must be incorporated into the building. Team have confirmed SNA will be complete at Stage 3.                                                                                                                                                                                                                                                                                                                         |
| Hea 07: Safe & Healthy Surroundings | Safe access                                               | 1  | 1  |     | Landscape Architect       | Site designed to provide safe access onto and throughout the site for cyclist and pedestrians. Dedicated cycle/ pedestrian pathways required providing direct access to building entrance, cycle storage, car parks. Safe crossings must be provided where the pathways come into contact with road. Pedestrian drop off areas must provide direct access to pathway. Dedicated delivery areas provided away from standard car parking.                                                                                                                                                                           |
|                                     | Outside space                                             | 1  | 1  |     | Landscape Architect       | Non-smoking outside amenity space required for building users away from any disturbances.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                     |                                                           | 18 | 14 | 4   |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| ENERGY - 1 credit = 0.73%                            |                                                                                                      |           |          |           |                   |                                                                                                                                                                                                                                |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------|----------|-----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      |                                                                                                      | Available | Targeted | Potential | Responsible Party | Comments                                                                                                                                                                                                                       |
| Ene 01: Reduction of energy use and carbon emissions | Reduction of energy use and carbon emissions<br>BREEAM Excellent Rating Minimum Standard (4 credits) | 9         | 9        |           | M&E               | Targeted credits based on initial bruks received from FLOH 05/01/25.                                                                                                                                                           |
|                                                      | Operational energy consumption                                                                       | 4         | 0        | 4         | M&E               | Undertake detailed energy modelling to determine the building's predicted operational energy consumption (TMS4). Modelling used to determine an energy target for the building based on the results of the scenario modelling. |

|                                                 |                                                                                       |     |    |   |                                 |                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|---------------------------------------------------------------------------------------|-----|----|---|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ene 02: Energy monitoring                       | Sub-metering of end use categories<br><b>BREEAM Excellent Rating Minimum Standard</b> | 1   | 1  |   | M&E                             | Install energy sub-metering so that 90% of the estimated annual energy consumption of each fuel is assigned to end-use categories as a minimum. Building area assumed to be greater than 1000m2, therefore required electrical metering to be monitored through BMS.                                                                                              |
| Ene 03: External lighting                       | External lighting                                                                     | 1   | 1  |   | M&E                             | External lighting to achieve a minimum average of 70 ll/cw, automatic controls and presence detection in intermittent areas.                                                                                                                                                                                                                                      |
| Ene 04: Low carbon design                       | Passive design analysis                                                               | 1   | 1  |   | M&E                             | Passive Design Analysis to be undertaken prior to completion of Stage 2 received.                                                                                                                                                                                                                                                                                 |
|                                                 | Free cooling                                                                          | 1   | 0  |   | M&E                             | Free Cooling Analysis would be required. Not targeted due to nature of building.                                                                                                                                                                                                                                                                                  |
|                                                 | Low and zero carbon technologies                                                      | 1   | 1  |   | M&E                             | LZC feasibility study to be undertaken prior to completion of Stage 2 received. LZC Technology to be specified in line with recommendations of study.                                                                                                                                                                                                             |
| Ene05: Energy Efficient Cold Storage            | Refrigeration energy consumption                                                      | N/A |    |   | M&E                             | Project team have confirmed that no relevant commercial cold storage areas are specified.                                                                                                                                                                                                                                                                         |
|                                                 | Indirect greenhouse gas emissions                                                     | N/A |    |   | M&E                             |                                                                                                                                                                                                                                                                                                                                                                   |
| Ene 06: Energy efficient transportation systems | Energy consumption                                                                    | 1   | 1  |   | Lift Supplier / Architect / MEP | Lift Transport Analysis required to analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts. Criteria issued 10/06.                                                                                                                                                                               |
|                                                 | Energy efficient features - lifts                                                     | 1   | 1  |   | Lift Supplier / Architect / MEP | The specified lift should have the appropriate energy efficient features, standby condition, lighting with an average luminous efficacy of > 70 luminaire lumens per circuit Watt, drive controller. Regenerative drives should be specified where their use would save energy.                                                                                   |
|                                                 | Energy efficient features - escalators or moving walks                                | N/A |    |   | Lift Consultant                 | It has been assumed there are no escalators specified.                                                                                                                                                                                                                                                                                                            |
| Ene 07: Energy efficient laboratory systems     |                                                                                       | N/A |    |   | M&E                             | It has been assumed there are no labs onsite.                                                                                                                                                                                                                                                                                                                     |
| Ene 08: Energy efficient equipment              |                                                                                       | 2   | 2  |   | M&E                             | The buildings highest consuming unregulated energy loads must be identified (e.g. domestic scale appliances, IT intensive operating areas, catering facilities). Processes to allow for a meaningful reduction in the total annual unregulated energy consumption of the building must be demonstrated. FLOH to review criteria and confirm potential to achieve. |
|                                                 |                                                                                       | 22  | 17 | 4 |                                 |                                                                                                                                                                                                                                                                                                                                                                   |

| TRANSPORT - 1 credit = 0.83%               |                                |           |          |           |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|--------------------------------|-----------|----------|-----------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            |                                | Available | Targeted | Potential | Responsible Party                                 | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Tra 01: Transport assessment & travel plan | Travel plan                    | 2         | 2        |           | Transport Consultant                              | BREEAM Compliant Transport Assessment and Travel Plan received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Tra 02: Sustainable transport measures     | Sustainable transport measures | 10        | 7        |           | Architect / Landscape Architect / MEP / Transport | <p><b>Targeted:</b></p> <ul style="list-style-type: none"> <li>- Provision of public transport information system is publicly accessible area (1 point).</li> <li>- Provide electric recharging stations of a minimum of 7kW for at least 10% of the total car parking capacity (1 point).</li> <li>- Provide secure and well lit cycle storage, 5 spaces required per class in the average year group (primary school that has three classes per year group would provide a total of 15 compliant cycle storages spaces for the whole school) (1 point).</li> <li>- Provide the following cyclist facilities - Cloakroom for pupils, 1 locker per 10 members of staff and 1 shower per 10 lockers (1 point).</li> <li>- Enhanced amenity - Nursey and access to outdoor space (3 points).</li> </ul> <p><b>Not Targeted:</b></p> <ul style="list-style-type: none"> <li>- Increase in AI</li> <li>- Dedicated bus service</li> <li>- Car Sharing group / Car Share spaces - criteria issued 10/06.</li> <li>- Consultation on cycling network - criteria issued 10/06.</li> </ul> |
|                                            |                                | 12        | 9        | 0         |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| WATER - 1 credit = 0.78%                    |                                                                                                   |           |          |           |                     |                                                                                                                                                                                                                                           |
|---------------------------------------------|---------------------------------------------------------------------------------------------------|-----------|----------|-----------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             |                                                                                                   | Available | Targeted | Potential | Responsible Party   | Comments                                                                                                                                                                                                                                  |
| Wat 01: Water consumption                   | Water consumption<br><b>BREEAM Excellent Rating Minimum Standard</b>                              | 5         | 3        |           | M&E / Stace         | Water efficient sanitaryware to be specified to achieve a minimum of 3 credits based on flow rates.                                                                                                                                       |
| Wat 02: Water monitoring                    | Pulsed water meter and submeters<br><b>BREEAM Excellent Rating Minimum Standard (Criterion 1)</b> | 1         | 1        |           | M&E                 | Installation of pulsed water meter to the mains supply to the building, and pulsed water sub-meters to water consuming plant or building areas consuming 10% or more of the buildings total water demand. Connection to BMS if specified. |
| Wat 03: Water leak detection and prevention | Leak detection system                                                                             | 1         | 1        |           | M&E                 | Installation of a leak detection system capable of detecting a major water leak on the supply within the building and between the building and the utilities water supply.                                                                |
|                                             | Flow control devices                                                                              | 1         | 1        |           | M&E                 | Installation of flow control devices in each sanitaryware area to minimise undetected wastage and leaks from sanitary fittings and supply pipework.                                                                                       |
| Wat 04: Water efficient equipment           | Water efficient consumption                                                                       | 1         | 1        |           | Landscape Architect | It has been assumed that there are no unregulated demands for water other than landscaping. To achieve compliance landscaping will rely solely on precipitation/ manual water rather than an irrigation system.                           |
|                                             |                                                                                                   | 9         | 7        | 0         |                     |                                                                                                                                                                                                                                           |

| MATERIALS - 1 credit = 1.07%                             |                                                              |           |          |           |                    |                                                                                                                                                                                             |
|----------------------------------------------------------|--------------------------------------------------------------|-----------|----------|-----------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                          |                                                              | Available | Targeted | Potential | Responsible Party  | Comments                                                                                                                                                                                    |
| Mat 01: Environmental impacts from construction products | Building LCA - Concept Design - Superstructure               | 6         | 6        |           | Client / Architect | LCA exercise complete and was submitted to the BRE prior to the completion of Concept Design. Technical design LCA also required to achieve targeted credits.                               |
|                                                          | Building LCA - Technical Design - Superstructure             |           |          |           |                    |                                                                                                                                                                                             |
|                                                          | LCA Options - Concept Design - Superstructure                |           |          |           |                    | 5 credits + 1 ex core building services achieved at Concept Design. Achieving the 2 remaining Technical Design credits relies on the design team providing relevant information at Stage 4. |
|                                                          | LCA Options - Technical Design - Superstructure              |           |          |           |                    |                                                                                                                                                                                             |
|                                                          | LCA Options - Concept Design - Substructure/hard landscaping | 1         | 1        |           | Client / Architect | LCA exercise to be completed and submitted to the BRE prior to the completion of Concept Design. 1 credit targeted at concept design, targets based on LCA consultants advice.              |

|                                                          |                                                                                                     |           |           |          |               |                                                                                                                                                                                                                                                                                                         |
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| Mat 02: Environmental impacts from construction products | Environmental Product Declarations                                                                  | 1         | 0         | 1        | Contractor    | Products should be procured to ensure a sufficient number of products have an EPD, to enable the credit to be awarded. Design team confirmed in initial PA meeting there is potential to include requirement for EPDs into contractor tender requirements. Credit to be monitored as scheme progresses. |
| Mat 03: Responsible sourcing of construction products    | Prereq: Legal & sustainable timber<br><b>BREEAM Excellent Rating Minimum Standard (Criterion 1)</b> | 0         | Yes       |          | Contractor    | Contractor will prove the use of only legal and sustainable timber.                                                                                                                                                                                                                                     |
|                                                          | Sustainable procurement                                                                             | 1         | 1         |          | Client        | Sustainable Procurement Plan to be provided before the end of RIBA Stage 2. Content to be implemented. Client has confirmed SPP is currently being produced.                                                                                                                                            |
|                                                          | Responsible sourcing                                                                                | 3         | 2         | 1        | Contractor    | Products to be procured with responsible sourcing certification, e.g. BES6001, ISO14001, FSC, PEFC etc.                                                                                                                                                                                                 |
| Mat 05: Designing for durability and resilience          | Protecting the building from damage and degradation                                                 | 1         | 1         |          | Architect     | Durability and resilience report will need to be provided to demonstrate vulnerable elements of the building have been protected from damage and degradation.                                                                                                                                           |
| Mat 06: Material efficiency                              | Optimisation measures investigated and implemented                                                  | 1         | 1         |          | Collaboration | Evidence of material efficiency discussions required for RIBA Stage 1 - 6. Evidence for RIBA 1 and 2 received. Template to be updated at RIBA Stage 3, reissued for completion 10/06.                                                                                                                   |
|                                                          |                                                                                                     | <b>14</b> | <b>12</b> | <b>2</b> |               |                                                                                                                                                                                                                                                                                                         |

| WASTE - 1 credit = 0.67%                        |                                                                                               |           |          |           |                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------|----------|-----------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 |                                                                                               | Available | Targeted | Potential | Responsible Party   | Comments                                                                                                                                                                                                                                                                                                                                                                                                 |
| Wst 01: Construction waste management           | Predemolition audit                                                                           | N/A       |          |           | Client / Contractor | No demolition taking place.                                                                                                                                                                                                                                                                                                                                                                              |
|                                                 | Resource efficiency                                                                           | 3         | 2        | 1         | Contractor          | Provision of site waste management plan and achievement of waste volume targets:<br>- 2 Credits: $\leq 7.5 \text{ m}^3$ per $100\text{m}^2$ or $\leq 6.5$ tonnes per $100\text{m}^2$ .<br>- 3 Credits: $\leq 3.4 \text{ m}^3$ per $100\text{m}^2$ or $\leq 3.2$ tonnes per $100\text{m}^2$ .<br>- Exemplary Level: $\leq 1.6 \text{ m}^3$ per $100\text{m}^2$ or $\leq 1.9$ tonnes per $100\text{m}^2$ . |
|                                                 | Diversion from landfill                                                                       | 1         | 1        |           | Contractor          | Achievement of waste diverted from landfill targets:<br>- Non-demolition: 70% by volume or 80% by tonnage.                                                                                                                                                                                                                                                                                               |
| Wst 02: Sustainable aggregates                  | Sustainable aggregate points                                                                  | 1         | 0        | 1         | Contractor          | Added as a potential credit. Compliance will be reviewed once contractor has identified viable aggregate sources. Aggregate sources are currently unknown and therefore compliance is not certain, given availability may not be guaranteed.                                                                                                                                                             |
| Wst 03: Operational waste                       | Recycling and non recyclable waste storage<br><b>BREEAM Excellent Rating Minimum Standard</b> | 1         | 1        |           | Architect           | Accessible waste/ recycling storage area of sufficient size required (4m2 per 1000m of net floor area for buildings with onsite catering). This is in addition to any non-recyclable waste storage. Organic waste facilities also required due to onsite catering.                                                                                                                                       |
| Wst 04: Speculative finishes                    |                                                                                               | N/A       |          |           | Client              | N/A Building not speculative.                                                                                                                                                                                                                                                                                                                                                                            |
| Wst 05: Adaptation to climate change            | Adaptation to Climate Change                                                                  | 1         | 1        |           | Collaboration       | Adaptation to climate change study complete. Any recommendations are to be intergrated into the building design.                                                                                                                                                                                                                                                                                         |
| Wst 06: Design for disassembly and adaptability | Recommendations                                                                               | 1         | 1        |           | Collaboration       | Functional adaptability study at Stage 2 complete. Study to be updated with details of implementation at Stage 4.                                                                                                                                                                                                                                                                                        |
|                                                 | Implementation                                                                                | 1         | 1        |           | Collaboration       |                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                 |                                                                                               | <b>9</b>  | <b>7</b> | <b>2</b>  |                     |                                                                                                                                                                                                                                                                                                                                                                                                          |

| LANDUSE & ECOLOGY - 1 credit = 1.00%                           |                                                    |           |          |           |                          |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------|----------------------------------------------------|-----------|----------|-----------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                |                                                    | Available | Targeted | Potential | Responsible Party        | Comments                                                                                                                                                                                                                                                                                                                                                                                                            |
| LE01: Site selection                                           | Previously occupied land                           | 1         | 0        |           | Architect                | Not targeted as development is situated on currently undeveloped land.                                                                                                                                                                                                                                                                                                                                              |
|                                                                | Contaminated land                                  | 1         | 0        |           | Environmental Consultant | Any sources of contamination identified would need to be remediated in line with a remediation strategy. It is not currently anticipated that there will be any contamination onsite.                                                                                                                                                                                                                               |
| LE02: Ecological risks and opportunities - comprehensive route | Prerequisite: statutory obligations                | 0         | Yes      |           | Ecologist                | Early stage Preliminary Ecological Appraisal received. Ecologist to complete GN40 document to confirm achievable credits and outline the onsite ecological enhancement strategy. Pre/ post development BNG calculations required. Landscape and Ecology Management Plan also required for LE05.<br><br>GN40 issued 10/06. TEP has confirmed BNG documentation and CV has been issued to the team - requested 10/06. |
|                                                                | Survey and evaluation                              | 1         | 1        |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Determining ecological outcomes                    | 1         | 1        |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| LE03: Managing impacts on ecology - comprehensive route        | Prerequisite: ecological risks and opportunities   | 0         | Yes      |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Planning and measures on site                      | 1         | 1        |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Managing negative impacts                          | 2         | 1        | 1         | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| LE04: Ecological change and enhancement - comprehensive route  | Prerequisite: managing negative impacts on ecology | 0         | Yes      |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Ecological enhancement                             | 1         | 1        |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Change and enhancement of ecology                  | 3         | 2        | 1         | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| LE05: Long term ecology management and maintenance             | Prerequisite: statutory obligations                | 0         | Yes      |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Management and maintenance throughout the project  | 1         | 1        |           | Contractor               |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                | Landscape and ecology management plan              | 1         | 1        |           | Ecologist                |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                |                                                    | 13        | 9        | 2         |                          |                                                                                                                                                                                                                                                                                                                                                                                                                     |

| POLLUTION - 1 credit = 0.67%   |                                               |           |          |           |                   |                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------|-----------------------------------------------|-----------|----------|-----------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                                               | Available | Targeted | Potential | Responsible Party | Comments                                                                                                                                                                                                                                                                                                                                |
| Pol 01: Impact of refrigerants | Absence of refrigerant containing systems     | N/A       |          |           | M&E               |                                                                                                                                                                                                                                                                                                                                         |
|                                | Refrigerant containing systems DELCO2/GWP     | 2         | 1        |           | M&E               | Achievement of a DELCO2 calculation of 1000 or less. POL1 calc to be run.                                                                                                                                                                                                                                                               |
|                                | Hermetically sealed systems or leak detection | 1         | 0        | 1         | M&E               | Credit requires that all systems are hermetically sealed, or, that a leak detection system is installed.                                                                                                                                                                                                                                |
| Pol 02: Local air quality      | Non combustion systems or low NOx             | 2         | 2        |           | M&E               | It has been assumed all heating and hot water will be supplied by non-combustion systems.                                                                                                                                                                                                                                               |
|                                | Flood risk zone                               | 2         | 0        | 1         | Drainage Engineer | Credits currently not targeted as the Environment Agency online flood risk map confirms the area is in a high flood risk zone. Achievability of credits will be reassessed once the development Flood Risk Assessment has been received - AF confirmed in meeting 10/06 FRA being produced as part of Stage 3 works. GN38 issued 10/06. |

|                                                 |                                  |    |   |   |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------|----------------------------------|----|---|---|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pol 03: Flood and surface water management      | Surface water runoff (rate)      | 1  | 1 |   | Drainage Engineer   | Drainage engineer to complete GN38. Credit currently targeted on the assumption that the runoff rate will not exceed the pre-development scenario, including the climate change event. GN38 issued 10/06.                                                                                                                                                                                                                              |
|                                                 | Surface water runoff (volume)    | 1  | 1 |   | Drainage Engineer   | Drainage engineer to complete GN38. Credit currently targeted on the assumption that post development volume will not exceed the pre-development scenario, including the climate change event. GN38 issued 10/06.                                                                                                                                                                                                                      |
|                                                 | Minimising watercourse pollution | 1  | 0 | 1 | Drainage Engineer   | Drainage engineer to complete GN38 and confirm whether credit is achievable. Key criteria to be confirmed that there will be no discharge from the developed site for rainfall up to 5mm, OR, justification in line with KBCN1059. Drainage engineer AF confirmed in initial PA meeting that this credit is likely to be achieved, will be moved to target score once confirmed and finalised in drainage strategy. GN38 issued 10/06. |
| Pol 04: Reduction of night time light pollution | External lighting                | 1  | 1 |   | Electrical Engineer | External lighting will be designed and installed in line with the ILP guidance and will be able to switch off automatically between 23:00 and 07:00.                                                                                                                                                                                                                                                                                   |
| Pol 05: Reduction of noise pollution            | Noise impact assessment          | 1  | 1 |   | Acoustician         | Noise Impact Assessment. Noise to be undertaken to confirm that noise levels from the proposed building will be 5dB lower than background noise at the most exposed noise sensitive development.                                                                                                                                                                                                                                       |
|                                                 |                                  | 12 | 7 | 3 |                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| EXEMPLARY - 1 credit = 1.00%                                  |                                                           |           |          |           |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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|                                                               |                                                           | Available | Targeted | Potential | Responsible Party         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Man 03: Responsible construction practices                    | Responsible construction management                       | 1         | 0        | 1         | Contractor                | All items on Table 4.1 must be achieved OR a score of greater than 39 under the Considerate Constructors Scheme along with evidence for points G, P and Q of Table 4.1.                                                                                                                                                                                                                                                                                                                               |
| Hea 01: Visual comfort                                        | Daylighting                                               | 1         | 0        |           | Sustainability Consultant | It is not currently anticipated exemplary performance will be achieved, however this would be picked up under the review of Hea 01 if sufficient performance is attained.                                                                                                                                                                                                                                                                                                                             |
|                                                               | Internal and external lighting levels, zoning and control | 1         | 0        |           | M&E                       | The following would need to be met: lighting in each zone can be manually dimmed by occupants down to 20% of the maximum light output using dimmer switches positioned in accessible locations. Dimming and control gear should avoid flicker and noise.                                                                                                                                                                                                                                              |
| Hea 06: Security                                              | Security of site and building                             | 1         | 0        |           | As above                  | A SABRE assessment would be required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Ene 01: Reduction of energy use and carbon emissions          | Reduction of energy use and carbon emissions              | 5         | 0        |           | As above                  | It is currently uncertain whether exemplary performance will be achieved, however this would be picked up under the review of Ene 01 if sufficient performance is attained.                                                                                                                                                                                                                                                                                                                           |
| Wat 01: Water consumption                                     | Water consumption                                         | 1         | 0        |           | As above                  | It is unlikely compliance will be met.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mat 01: Building LCA                                          | LCA Options - Concept Design - Core building services     | 1         | 1        |           | As above                  | LCA options appraisal of at least 3 significantly different core building services design options to be carried out during Concept Design.                                                                                                                                                                                                                                                                                                                                                            |
|                                                               | LCA and LCC alignment                                     | 1         | 1        |           | As above                  | Align options within LCA & LCC, and integrate within design, to achieve credit. Technical Design tasks to be appointed.                                                                                                                                                                                                                                                                                                                                                                               |
|                                                               | Third Party verification                                  | 1         | 1        |           | As above                  | Suitably qualified person to complete or review & verify LCA work and options to award credit. Technical Design tasks to be appointed.                                                                                                                                                                                                                                                                                                                                                                |
| Mat 03: Responsible sourcing of construction products         | Responsible sourcing                                      | 1         | 0        |           | As above                  | 50% of available points would have to be achieved, including core building services to award credit. Supply chain difficulties may limit the potential here.                                                                                                                                                                                                                                                                                                                                          |
| Wst 01: Construction waste management                         | Resource efficiency                                       | 1         | 0        |           | As above                  | Exemplary level waste quantities to be met to award credit: $\leq 1.6m^3$ (actual, not bulk volume) / $\leq 1.9$ tonnes per 100m <sup>2</sup> GIFA                                                                                                                                                                                                                                                                                                                                                    |
| Wst 02: Sustainable aggregates                                | Sustainable aggregate points                              | 1         | 0        |           | As above                  | It is not currently anticipated exemplary performance will be achieved, however this would be picked up under the review of Wst 02 if sufficient performance is attained.                                                                                                                                                                                                                                                                                                                             |
| Wst 05: Adaptation to climate change                          | Responding to climate change                              | 1         | 0        |           | As above                  | The award of the following credit areas will achieve exemplary climate change performance. Currently there is uncertainty all areas will be sufficiently met.<br>Hea 04 thermal comfort - targeted<br>Ene 01 minimum of 6 credits - targeted<br>Ene 04 passive design analysis - targeted<br>Wat 01 water consumption minimum of 3 credits - potential<br>Mat 05 designing for durability and resilience - targeted<br>Pol 03 flood resilience - targeted<br>Pol 03 surface water run-off - potential |
| LE02: Ecological risks and opportunities                      | Wider site sustainability                                 | 1         | 0        |           | As above                  | Would require both Hea 07 credits & Pol 03 minimising watercourse pollution credits, to be achieved. Ecologist to advise if this credit will be achieved.                                                                                                                                                                                                                                                                                                                                             |
| LE04: Ecological change and enhancement - comprehensive route | Ecological enhancement                                    | 1         | 0        |           | As above                  | Ecologist to advise if significant net gain will be achieved.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                               |                                                           | 10        | 3        | 1         |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



#### **APPENDIX D – BRUKL DOCUMENTS**

1. Be Lean A
2. Be Lean B
3. Be Green
4. Be Clean

Project name

**F2371TM1121A (Lean)**

As designed

Date: Wed Sep 17 14:31:38 2025

## Administrative information

## Building Details

Address: Brookleigh Primary School, Burgess Hill,  
Postcode

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.29

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.29

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 1540.58The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 3.95                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 3.71                     |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m <sup>2</sup> annum            | 41.57                    |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m <sup>2</sup> annum          | 38.84                    |
| Do the building's emission and primary energy rates exceed the targets?               | BER ≤ TER    BPER ≤ TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                       | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value         |
|--------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Walls*                               | 0.26                 | 0.15                | 0.15                | 00000036:Surf[12]                        |
| Floors                               | 0.18                 | 0.12                | 0.12                | 0000001F:Surf[0]                         |
| Pitched roofs                        | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                           | 0.18                 | 0.12                | 0.12                | 0000004A:Surf[1]                         |
| Windows** and roof windows           | 1.6                  | 1.1                 | 1.1                 | 00000036:Surf[1]                         |
| Rooflights***                        | 2.2                  | 1.5                 | 1.5                 | 01000011:Surf[0]                         |
| Personnel doors <sup>^</sup>         | 1.6                  | 0.34                | 0.34                | 00000036:Surf[10]                        |
| Vehicle access & similar large doors | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors            | 3                    | -                   | -                   | No high usage entrance doors in building |

U<sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check.      \*\*\* Values for rooflights refer to the horizontal position.

<sup>^</sup> For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 3.07          |

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- htg ASHP clg NONE vent MVHR

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | 0.8           |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 2- htg ASHP clg NONE vent EX

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 3- htg ASHP clg NONE vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 4- htg NONE clg SPLIT vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | 2.64               | -                  | -             | -             |
| Standard value                                                                                | 2.5*               | 5                  | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID                                                                                                                                       | System type in the Approved Documents                                 |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| A                                                                                                                                        | Local supply or extract ventilation units                             |
| B                                                                                                                                        | Zonal supply system where the fan is remote from the zone             |
| C                                                                                                                                        | Zonal extract system where the fan is remote from the zone            |
| D                                                                                                                                        | Zonal balanced supply and extract ventilation system                  |
| E                                                                                                                                        | Local balanced supply and extract ventilation units                   |
| F                                                                                                                                        | Other local ventilation units                                         |
| G                                                                                                                                        | Fan assisted terminal variable air volume units                       |
| H                                                                                                                                        | Fan coil units                                                        |
| I                                                                                                                                        | Kitchen extract with the fan remote from the zone and a grease filter |
| NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. |                                                                       |

| Zone name                        | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|----------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                  | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                  | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 00_G002_MEDICAL INSPECTION ROOM  | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G003_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G004_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G005_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G006_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G007_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G008_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G009_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G010_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G011_SMALL ART CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G012_MAIN HALL                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G015_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G016_SENSORY ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G017_SSC RESOURCE BASE        | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G018_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G019_QUIET SPACE              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G020_GENERAL OFFICE RECEPTION | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G024_INTERVIEW ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G025_SICK BAY                 | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G026_SSC STAFF WORK ROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G027_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G028_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G029_STAFF WORK ROOM          | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G046_STUDIO HALL              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G063_DWC & BABY CHANGE        | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G065_KITCHEN PREP & SERVE     | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G067_WC CH                    | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G068_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G069_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G070_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G071_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G072_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G073_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G074_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G075_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G076_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G077_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G078_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G079_STAFF WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G080_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G081_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G083_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G084_HYGIENE ROOM             | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| Zone name                          | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|------------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                    | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                    | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 01_F001_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F002_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F003_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F004_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F005_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F006_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F007_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F008_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F009_SCIENCE ICT CLASSROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F012_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F013_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F014_LIFE SKILLS ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F016_STAFF PPA ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F018_REPROGRAPHICS              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F039_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F040_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F041_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F042_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F043_STAFF SH & WC              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F044_AWC                        | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F050_AMPHITHEATRE STEP SEATING- | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G000_VOID                          |                | 80                | -                    | -                    |
| 00_G002_MEDICAL INSPECTION ROOM       |                | 80                | -                    | -                    |
| 00_G003_RECEPTION CLASSROOM           |                | 80                | -                    | -                    |
| 00_G004_RECEPTION CLASSROOM           |                | 80                | -                    | -                    |
| 00_G005_KS1 CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G006_KS1 CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G007_KS1 CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G008_KS1 CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G009_SSC CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G010_SSC CLASSROOM                 |                | 80                | -                    | -                    |
| 00_G011_SMALL ART CLASSROOM           |                | 80                | -                    | -                    |
| 00_G012_MAIN HALL                     |                | 80                | -                    | -                    |
| 00_G012A_LOBBY_MAIN HALL              |                | 80                | -                    | -                    |
| 00_G012B_LOBBY_MAIN HALL              |                | 80                | -                    | -                    |
| 00_G013_SMALL GROUP                   |                | 80                | -                    | -                    |
| 00_G014_SMALL GROUP                   |                | 80                | -                    | -                    |

| General lighting and display lighting  |                | General luminaire | Display light source |                      |
|----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                              |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                        | Standard value | 95                | 80                   | 0.3                  |
| 00_G015_SMALL GROUP                    |                | 80                | -                    | -                    |
| 00_G016_SENSORY ROOM                   |                | 80                | -                    | -                    |
| 00_G017_SSC RESOURCE BASE              |                | 80                | -                    | -                    |
| 00_G018_SMALL GROUP                    |                | 80                | -                    | -                    |
| 00_G019_QUIET SPACE                    |                | 80                | -                    | -                    |
| 00_G020_GENERAL OFFICE RECEPTION       |                | 80                | -                    | -                    |
| 00_G022_SCHOOL WAITING AREA            |                | 80                | -                    | -                    |
| 00_G023_NURSERY WAITING AREA           |                | 80                | -                    | -                    |
| 00_G024_INTERVIEW ROOM                 |                | 80                | -                    | -                    |
| 00_G025_SICK BAY                       |                | 80                | -                    | -                    |
| 00_G026_SSC STAFF WORK ROOM            |                | 80                | -                    | -                    |
| 00_G027_KITCHENETTE                    |                | 80                | -                    | -                    |
| 00_G028_KITCHENETTE                    |                | 80                | -                    | -                    |
| 00_G029_STAFF WORK ROOM                |                | 80                | -                    | -                    |
| 00_G030_NURSERY TEACH STORAGE          |                | 80                | -                    | -                    |
| 00_G031_NURSERY TEACH STORAGE          |                | 80                | -                    | -                    |
| 00_G032_G033_TEACH STORAGE             |                | 80                | -                    | -                    |
| 00_G034_G035_TEACH STORAGE             |                | 80                | -                    | -                    |
| 00_G036_TEACH STORAGE                  |                | 80                | -                    | -                    |
| 00_G037_TEACH STORAGE                  |                | 80                | -                    | -                    |
| 00_G038_TEACH STORAGE                  |                | 80                | -                    | -                    |
| 00_G039_TEACH STORAGE                  |                | 80                | -                    | -                    |
| 00_G040_TEACH STORE                    |                | 80                | -                    | -                    |
| 00_G041_TEACH STORE                    |                | 80                | -                    | -                    |
| 00_G042_SPECIALIST STORE               |                | 80                | -                    | -                    |
| 00_G043_LAPTOP TROLLEY STORE           |                | 80                | -                    | -                    |
| 00_G044_PE STORE                       |                | 80                | -                    | -                    |
| 00_G045_EXT PE STORE                   |                | 80                | -                    | -                    |
| 00_G046_STUDIO HALL                    |                | 80                | -                    | -                    |
| 00_G048_SERVERY DINING FURNITURE STORE |                | 80                | -                    | -                    |
| 00_G049_SECURE ARCHIVE STORE           |                | 80                | -                    | -                    |
| 00_G053_CLOAKROOM STORAGE              |                | 80                | -                    | -                    |
| 00_G054_CLOAKROOM STORAGE              |                | 80                | -                    | -                    |
| 00_G055_CLOAKROOM STORAGE              |                | 80                | -                    | -                    |
| 00_G056_CLOAKROOM STORAGE              |                | 80                | -                    | -                    |
| 00_G061_CL STORE                       |                | 80                | -                    | -                    |
| 00_G062_GENERAL STORE                  |                | 80                | -                    | -                    |
| 00_G063_DWC & BABY CHANGE              |                | 80                | -                    | -                    |
| 00_G064_MAINTENANCE STORE              |                | 80                | -                    | -                    |
| 00_G065_KITCHEN PREP & SERVE           |                | 80                | -                    | -                    |
| 00_G066_DRY STORE                      |                | 80                | -                    | -                    |
| 00_G067_WC CH                          |                | 80                | -                    | -                    |
| 00_G068_PUPIL WC                       |                | 80                | -                    | -                    |

| General lighting and display lighting   |                | General luminaire | Display light source |                      |
|-----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                               |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                         | Standard value | 95                | 80                   | 0.3                  |
| 00_G069_PUPIL WC                        |                | 80                | -                    | -                    |
| 00_G070_PUPIL WC                        |                | 80                | -                    | -                    |
| 00_G071_SUPERVISABLE WCS                |                | 80                | -                    | -                    |
| 00_G072_SUPERVISABLE WCS                |                | 80                | -                    | -                    |
| 00_G073_SUPERVISABLE WCS                |                | 80                | -                    | -                    |
| 00_G074_SUPERVISABLE WCS                |                | 80                | -                    | -                    |
| 00_G075_PUPIL WCS                       |                | 80                | -                    | -                    |
| 00_G076_PUPIL WCS                       |                | 80                | -                    | -                    |
| 00_G077_JUNIOR WCS                      |                | 80                | -                    | -                    |
| 00_G078_JUNIOR WCS                      |                | 80                | -                    | -                    |
| 00_G079_STAFF WC                        |                | 80                | -                    | -                    |
| 00_G080_AWC                             |                | 80                | -                    | -                    |
| 00_G081_AWC                             |                | 80                | -                    | -                    |
| 00_G083_AWC                             |                | 80                | -                    | -                    |
| 00_G084_HYGIENE ROOM                    |                | 80                | -                    | -                    |
| 00_G085_PLANT ELECTRICAL & COLD WATER   |                | 80                | -                    | -                    |
| 00_G086_STAIRWELL                       |                | 80                | -                    | -                    |
| 00_G087_STAIRWELL                       |                | 80                | -                    | -                    |
| 00_G088_LIFT                            |                | 80                | -                    | -                    |
| 00_G089_ENTRANCE LOBBY                  |                | 80                | -                    | -                    |
| 00_G092_LOBBY                           |                | 80                | -                    | -                    |
| 00_G094_LOBBY                           |                | 80                | -                    | -                    |
| 00_G095_SSC CORRIDOR                    |                | 80                | -                    | -                    |
| 00_G096_MAIN CIRCULATION NORTH          |                | 80                | -                    | -                    |
| 00_G097_MAIN CIRCULATION SOUTH          |                | 80                | -                    | -                    |
| 00_G105_DIST BOARD                      |                | 80                | -                    | -                    |
| 00_G106_DIST BOARD                      |                | 80                | -                    | -                    |
| 00_G107 ICT HUB                         |                | 80                | -                    | -                    |
| 00_G108 ICT HUB                         |                | 80                | -                    | -                    |
| 00_G109_RISER                           |                | 80                | -                    | -                    |
| 00_G110_RISER                           |                | 80                | -                    | -                    |
| 01_F000_LIGHTWELL OVER MAIN CIRCULATION |                | 80                | -                    | -                    |
| 01_F000_LOBBY TO PLANT DECK             |                | 80                | -                    | -                    |
| 01_F000_RISER                           |                | 80                | -                    | -                    |
| 01_F000_RISER                           |                | 80                | -                    | -                    |
| 01_F000_VOID                            |                | 80                | -                    | -                    |
| 01_F000_VOID                            |                | 80                | -                    | -                    |
| 01_F000_VOID                            |                | 80                | -                    | -                    |
| 01_F000_VOID OVER BREAKOUT              |                | 80                | -                    | -                    |
| 01_F000_VOID OVER MAIN HALL             |                | 80                | -                    | -                    |
| 01_F000_VOID OVER STUDIO HALL           |                | 80                | -                    | -                    |
| 01_F001_KS2 CLASSROOM                   |                | 80                | -                    | -                    |
| 01_F002_KS2 CLASSROOM                   |                | 80                | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 01_F003_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F004_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F005_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F006_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F007_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F008_KS2 CLASSROOM                 |                | 80                | -                    | -                    |
| 01_F009_SCIENCE ICT CLASSROOM         |                | 80                | -                    | -                    |
| 01_F010_LIBRARY                       |                | 80                | -                    | -                    |
| 01_F011_SEND RESOURCE BASE            |                | 80                | -                    | -                    |
| 01_F012_SMALL GROUP                   |                | 80                | -                    | -                    |
| 01_F013_SMALL GROUP                   |                | 80                | -                    | -                    |
| 01_F014_LIFE SKILLS ROOM              |                | 80                | -                    | -                    |
| 01_F015_STAFF ROOM                    |                | 80                | -                    | -                    |
| 01_F016_STAFF PPA ROOM                |                | 80                | -                    | -                    |
| 01_F017_HT OFFICE                     |                | 80                | -                    | -                    |
| 01_F018_REPROGRAPHICS                 |                | 80                | -                    | -                    |
| 01_F019_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F020_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F021_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F022_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F023_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F024_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F025_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F026_TEACH STORAGE                 |                | 80                | -                    | -                    |
| 01_F027_SPECIALIST STORE              |                | 80                | -                    | -                    |
| 01_F028_LAPTOP TROLLEY STORE          |                | 80                | -                    | -                    |
| 01_F029_STORAGE                       |                | 80                | -                    | -                    |
| 01_F030_STORAGE                       |                | 80                | -                    | -                    |
| 01_F031_STORAGE                       |                | 80                | -                    | -                    |
| 01_F032_STORAGE                       |                | 80                | -                    | -                    |
| 01_F038_CL STORE                      |                | 80                | -                    | -                    |
| 01_F039_PUPIL WCS                     |                | 80                | -                    | -                    |
| 01_F040_PUPIL WCS                     |                | 80                | -                    | -                    |
| 01_F041_STAFF WC                      |                | 80                | -                    | -                    |
| 01_F042_STAFF WC                      |                | 80                | -                    | -                    |
| 01_F043_STAFF SH & WC                 |                | 80                | -                    | -                    |
| 01_F044_AWC                           |                | 80                | -                    | -                    |
| 01_F045_SERVER ROOM                   |                | 80                | -                    | -                    |
| 01_F046_STAIRWELL                     |                | 80                | -                    | -                    |
| 01_F047_STAIRWELL                     |                | 80                | -                    | -                    |
| 01_F048_MAIN CIRCULATION              |                | 80                | -                    | -                    |
| 01_F050_AMPHITHEATRE STEP SEATING     |                | 80                | -                    | -                    |
| 01_G000_LIFT                          |                | 80                | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G001_NURSERY PLAYROOM              |                | 80                | -                    | -                    |
| 00_G001_NURSERY PLAYROOM              |                | 80                | -                    | -                    |

**The spaces in the building should have appropriate passive control measures to limit solar gains in summer**

| Zone                             | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------|--------------------------------|-----------------------|
| 00_G002_MEDICAL INSPECTION ROOM  | N/A                            | N/A                   |
| 00_G003_RECEPTION CLASSROOM      | NO (-9%)                       | NO                    |
| 00_G004_RECEPTION CLASSROOM      | NO (-9.4%)                     | NO                    |
| 00_G005_KS1 CLASSROOM            | NO (-12.9%)                    | NO                    |
| 00_G006_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G007_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G008_KS1 CLASSROOM            | NO (-55.8%)                    | NO                    |
| 00_G009_SSC CLASSROOM            | NO (-50.6%)                    | NO                    |
| 00_G010_SSC CLASSROOM            | NO (-46.4%)                    | NO                    |
| 00_G011_SMALL ART CLASSROOM      | YES (+9.8%)                    | NO                    |
| 00_G012_MAIN HALL                | N/A                            | N/A                   |
| 00_G013_SMALL GROUP              | NO (-59.8%)                    | NO                    |
| 00_G014_SMALL GROUP              | NO (-37%)                      | NO                    |
| 00_G015_SMALL GROUP              | NO (-86.4%)                    | NO                    |
| 00_G016_SENSORY ROOM             | N/A                            | N/A                   |
| 00_G017_SSC RESOURCE BASE        | N/A                            | N/A                   |
| 00_G018_SMALL GROUP              | N/A                            | N/A                   |
| 00_G019_QUIET SPACE              | NO (-99.8%)                    | NO                    |
| 00_G020_GENERAL OFFICE RECEPTION | N/A                            | N/A                   |
| 00_G024_INTERVIEW ROOM           | N/A                            | N/A                   |
| 00_G025_SICK BAY                 | N/A                            | N/A                   |
| 00_G026_SSC STAFF WORK ROOM      | N/A                            | N/A                   |
| 00_G029_STAFF WORK ROOM          | NO (-88.9%)                    | NO                    |
| 00_G046_STUDIO HALL              | N/A                            | N/A                   |
| 01_F001_KS2 CLASSROOM            | NO (-56.5%)                    | NO                    |
| 01_F002_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F003_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F004_KS2 CLASSROOM            | NO (-60.6%)                    | NO                    |
| 01_F005_KS2 CLASSROOM            | NO (-18.9%)                    | NO                    |
| 01_F006_KS2 CLASSROOM            | NO (-9.1%)                     | NO                    |
| 01_F007_KS2 CLASSROOM            | NO (-9.4%)                     | NO                    |
| 01_F008_KS2 CLASSROOM            | NO (-11.3%)                    | NO                    |
| 01_F009_SCIENCE ICT CLASSROOM    | YES (+31.7%)                   | NO                    |
| 01_F010_LIBRARY                  | NO (-37.8%)                    | NO                    |
| 01_F011_SEND RESOURCE BASE       | NO (-87.3%)                    | NO                    |
| 01_F012_SMALL GROUP              | NO (-13.2%)                    | NO                    |
| 01_F013_SMALL GROUP              | NO (-94.4%)                    | NO                    |
| 01_F014_LIFE SKILLS ROOM         | YES (+25.5%)                   | NO                    |

| Zone                              | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------------------------|--------------------------------|-----------------------|
| 01_F015_STAFF ROOM                | NO (-46%)                      | NO                    |
| 01_F016_STAFF PPA ROOM            | NO (-42.3%)                    | NO                    |
| 01_F017_HT OFFICE                 | NO (-12%)                      | NO                    |
| 01_F018_REPROGRAPHICS             | N/A                            | N/A                   |
| 01_F045_SERVER ROOM               | N/A                            | N/A                   |
| 01_F050 AMPHITHEATRE STEP SEATING | N/A                            | N/A                   |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |

## Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Were alternative energy systems considered and analysed as part of the design process? | NO |
| Is evidence of such assessment available as a separate submission?                     | NO |
| Are any such measures included in the proposed design?                                 | NO |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 3294.4  | 3294.4   |
| External area [m <sup>2</sup> ]                       | 5669.9  | 5668     |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1289.26 | 1557.81  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.23    | 0.27     |
| Alpha value* [%]                                      | 24.37   | 10       |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

### % Area Building Type

Retail/Financial and Professional Services  
 Restaurants and Cafes/Drinking Establishments/Takeaways  
 Offices and Workshop Businesses  
 General Industrial and Special Industrial Groups  
 Storage or Distribution  
 Hotels  
 Residential Institutions: Hospitals and Care Homes  
 Residential Institutions: Residential Schools  
 Residential Institutions: Universities and Colleges  
 Secure Residential Institutions  
 Residential Spaces  
 Non-residential Institutions: Community/Day Centre  
 Non-residential Institutions: Libraries, Museums, and Galleries  
**100 Non-residential Institutions: Education**  
 Non-residential Institutions: Primary Health Care Building  
 Non-residential Institutions: Crown and County Courts  
 General Assembly and Leisure, Night Clubs, and Theatres  
 Others: Passenger Terminals  
 Others: Emergency Services  
 Others: Miscellaneous 24hr Activities  
 Others: Car Parks 24 hrs  
 Others: Stand Alone Utility Block

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 12.66        | 12.18        |
| Cooling        | 0            | 0            |
| Auxiliary      | 2.51         | 2.26         |
| Lighting       | 6.61         | 7.51         |
| Hot water      | 3.97         | 5.73         |
| Equipment*     | 24.13        | 24.13        |
| <b>TOTAL**</b> | <b>25.75</b> | <b>27.67</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 0        |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 113.03 | 121.82   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 38.84  | 41.57    |
| Total emissions [kg/m <sup>2</sup> ]                | 3.71   | 3.95     |

| HVAC Systems Performance                                                                          |                   |                   |                    |                    |                   |               |               |                  |                  |
|---------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                       | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 56.9              | 0                 | 6.4                | 0                  | 9.7               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 53                | 0                 | 5.3                | 0                  | 3.9               | 2.78          | 0             | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 40.6              | 0                 | 4.6                | 0                  | 1.2               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 52.7              | 0                 | 5.3                | 0                  | 1.2               | 2.78          | 0             | ----             | ----             |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity                 |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 2.59          | 1.97          | 2.64             | 2.64             |
| Notional                                                                                          | 0                 | 0                 | 0                  | 0                  | 0                 | 2.78          | 4.63          | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 197.6             | 0                 | 22.1               | 0                  | 1.9               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 209.7             | 0                 | 21                 | 0                  | 2.1               | 2.78          | 0             | ----             | ----             |
| [ST] No Heating or Cooling                                                                        |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |
| Notional                                                                                          | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ----             | ----             |

## Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

## Project name

**F2371TM1121B (Lean)**

As designed

Date: Wed Sep 17 14:26:59 2025

## Administrative information

## Building Details

Address: Brookleigh Primary School, Burgess Hill,  
Postcode

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.29

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.29

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 1540.58The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 3.95                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 3.49                     |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m <sup>2</sup> annum            | 41.57                    |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m <sup>2</sup> annum          | 36.37                    |
| Do the building's emission and primary energy rates exceed the targets?               | BER ≤ TER    BPER ≤ TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                       | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value         |
|--------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Walls*                               | 0.26                 | 0.15                | 0.15                | 00000036:Surf[12]                        |
| Floors                               | 0.18                 | 0.12                | 0.12                | 0000001F:Surf[0]                         |
| Pitched roofs                        | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                           | 0.18                 | 0.12                | 0.12                | 0000004A:Surf[1]                         |
| Windows** and roof windows           | 1.6                  | 1.1                 | 1.1                 | 00000036:Surf[1]                         |
| Rooflights***                        | 2.2                  | 1.5                 | 1.5                 | 01000011:Surf[0]                         |
| Personnel doors <sup>^</sup>         | 1.6                  | 0.34                | 0.34                | 00000036:Surf[10]                        |
| Vehicle access & similar large doors | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors            | 3                    | -                   | -                   | No high usage entrance doors in building |

U<sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.

<sup>^</sup> For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 3.07          |

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- htg ASHP clg NONE vent MVHR

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | 0.8           |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 2- htg ASHP clg NONE vent EX

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 3- htg ASHP clg NONE vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 4- htg NONE clg SPLIT vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 2.64               | 2.64               | -                  | -             | -             |
| Standard value                                                                                | 2.5*               | 5                  | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID                                                                                                                                       | System type in the Approved Documents                                 |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| A                                                                                                                                        | Local supply or extract ventilation units                             |
| B                                                                                                                                        | Zonal supply system where the fan is remote from the zone             |
| C                                                                                                                                        | Zonal extract system where the fan is remote from the zone            |
| D                                                                                                                                        | Zonal balanced supply and extract ventilation system                  |
| E                                                                                                                                        | Local balanced supply and extract ventilation units                   |
| F                                                                                                                                        | Other local ventilation units                                         |
| G                                                                                                                                        | Fan assisted terminal variable air volume units                       |
| H                                                                                                                                        | Fan coil units                                                        |
| I                                                                                                                                        | Kitchen extract with the fan remote from the zone and a grease filter |
| NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. |                                                                       |

| Zone name                        | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|----------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                  | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                  | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 00_G002_MEDICAL INSPECTION ROOM  | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G003_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G004_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G005_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G006_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G007_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G008_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G009_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G010_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G011_SMALL ART CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G012_MAIN HALL                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G015_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G016_SENSORY ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G017_SSC RESOURCE BASE        | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G018_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G019_QUIET SPACE              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G020_GENERAL OFFICE RECEPTION | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G024_INTERVIEW ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G025_SICK BAY                 | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G026_SSC STAFF WORK ROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G027_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G028_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G029_STAFF WORK ROOM          | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G046_STUDIO HALL              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G063_DWC & BABY CHANGE        | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G065_KITCHEN PREP & SERVE     | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G067_WC CH                    | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G068_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G069_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G070_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G071_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G072_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G073_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G074_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G075_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G076_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G077_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G078_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G079_STAFF WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G080_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G081_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G083_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G084_HYGIENE ROOM             | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| Zone name                          | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|------------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                    | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                    | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 01_F001_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F002_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F003_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F004_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F005_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F006_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F007_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F008_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F009_SCIENCE ICT CLASSROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F012_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F013_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F014_LIFE SKILLS ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F016_STAFF PPA ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F018_REPROGRAPHICS              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F039_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F040_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F041_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F042_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F043_STAFF SH & WC              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F044_AWC                        | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F050_AMPHITHEATRE STEP SEATING- | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G000_VOID                          |                | 120               | -                    | -                    |
| 00_G002_MEDICAL INSPECTION ROOM       |                | 120               | -                    | -                    |
| 00_G003_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G004_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G005_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G006_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G007_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G008_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G009_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G010_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G011_SMALL ART CLASSROOM           |                | 120               | -                    | -                    |
| 00_G012_MAIN HALL                     |                | 120               | -                    | -                    |
| 00_G012A_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G012B_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 00_G014_SMALL GROUP                   |                | 120               | -                    | -                    |

| General lighting and display lighting  |                | General luminaire | Display light source |                      |
|----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                              |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                        | Standard value | 95                | 80                   | 0.3                  |
| 00_G015_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G016_SENSORY ROOM                   |                | 120               | -                    | -                    |
| 00_G017_SSC RESOURCE BASE              |                | 120               | -                    | -                    |
| 00_G018_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G019_QUIET SPACE                    |                | 120               | -                    | -                    |
| 00_G020_GENERAL OFFICE RECEPTION       |                | 120               | -                    | -                    |
| 00_G022_SCHOOL WAITING AREA            |                | 120               | -                    | -                    |
| 00_G023_NURSERY WAITING AREA           |                | 120               | -                    | -                    |
| 00_G024_INTERVIEW ROOM                 |                | 120               | -                    | -                    |
| 00_G025_SICK BAY                       |                | 120               | -                    | -                    |
| 00_G026_SSC STAFF WORK ROOM            |                | 120               | -                    | -                    |
| 00_G027_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G028_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G029_STAFF WORK ROOM                |                | 120               | -                    | -                    |
| 00_G030_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G031_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G032_G033_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G034_G035_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G036_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G037_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G038_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G039_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G040_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G041_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G042_SPECIALIST STORE               |                | 120               | -                    | -                    |
| 00_G043_LAPTOP TROLLEY STORE           |                | 120               | -                    | -                    |
| 00_G044_PE STORE                       |                | 120               | -                    | -                    |
| 00_G045_EXT PE STORE                   |                | 120               | -                    | -                    |
| 00_G046_STUDIO HALL                    |                | 120               | -                    | -                    |
| 00_G048_SERVERY DINING FURNITURE STORE |                | 120               | -                    | -                    |
| 00_G049_SECURE ARCHIVE STORE           |                | 120               | -                    | -                    |
| 00_G053_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G054_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G055_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G056_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G061_CL STORE                       |                | 120               | -                    | -                    |
| 00_G062_GENERAL STORE                  |                | 120               | -                    | -                    |
| 00_G063_DWC & BABY CHANGE              |                | 120               | -                    | -                    |
| 00_G064_MAINTENANCE STORE              |                | 120               | -                    | -                    |
| 00_G065_KITCHEN PREP & SERVE           |                | 120               | -                    | -                    |
| 00_G066_DRY STORE                      |                | 120               | -                    | -                    |
| 00_G067_WC CH                          |                | 120               | -                    | -                    |
| 00_G068_PUPIL WC                       |                | 120               | -                    | -                    |

| General lighting and display lighting   |                | General luminaire | Display light source |                      |
|-----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                               |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                         | Standard value | 95                | 80                   | 0.3                  |
| 00_G069_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G070_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G071_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G072_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G073_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G074_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G075_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G076_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G077_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G078_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G079_STAFF WC                        |                | 120               | -                    | -                    |
| 00_G080_AWC                             |                | 120               | -                    | -                    |
| 00_G081_AWC                             |                | 120               | -                    | -                    |
| 00_G083_AWC                             |                | 120               | -                    | -                    |
| 00_G084_HYGIENE ROOM                    |                | 120               | -                    | -                    |
| 00_G085_PLANT ELECTRICAL & COLD WATER   |                | 120               | -                    | -                    |
| 00_G086_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G087_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G088_LIFT                            |                | 120               | -                    | -                    |
| 00_G089_ENTRANCE LOBBY                  |                | 120               | -                    | -                    |
| 00_G092_LOBBY                           |                | 120               | -                    | -                    |
| 00_G094_LOBBY                           |                | 120               | -                    | -                    |
| 00_G095_SSC CORRIDOR                    |                | 120               | -                    | -                    |
| 00_G096_MAIN CIRCULATION NORTH          |                | 120               | -                    | -                    |
| 00_G097_MAIN CIRCULATION SOUTH          |                | 120               | -                    | -                    |
| 00_G105_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G106_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G107 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G108 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G109_RISER                           |                | 120               | -                    | -                    |
| 00_G110_RISER                           |                | 120               | -                    | -                    |
| 01_F000_LIGHTWELL OVER MAIN CIRCULATION |                | 120               | -                    | -                    |
| 01_F000_LOBBY TO PLANT DECK             |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID OVER BREAKOUT              |                | 120               | -                    | -                    |
| 01_F000_VOID OVER MAIN HALL             |                | 120               | -                    | -                    |
| 01_F000_VOID OVER STUDIO HALL           |                | 120               | -                    | -                    |
| 01_F001_KS2 CLASSROOM                   |                | 120               | -                    | -                    |
| 01_F002_KS2 CLASSROOM                   |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 01_F003_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F004_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F005_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F006_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F007_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F008_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F009_SCIENCE ICT CLASSROOM         |                | 120               | -                    | -                    |
| 01_F010_LIBRARY                       |                | 120               | -                    | -                    |
| 01_F011_SEND RESOURCE BASE            |                | 120               | -                    | -                    |
| 01_F012_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F014_LIFE SKILLS ROOM              |                | 120               | -                    | -                    |
| 01_F015_STAFF ROOM                    |                | 120               | -                    | -                    |
| 01_F016_STAFF PPA ROOM                |                | 120               | -                    | -                    |
| 01_F017_HT OFFICE                     |                | 120               | -                    | -                    |
| 01_F018_REPROGRAPHICS                 |                | 120               | -                    | -                    |
| 01_F019_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F020_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F021_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F022_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F023_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F024_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F025_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F026_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F027_SPECIALIST STORE              |                | 120               | -                    | -                    |
| 01_F028_LAPTOP TROLLEY STORE          |                | 120               | -                    | -                    |
| 01_F029_STORAGE                       |                | 120               | -                    | -                    |
| 01_F030_STORAGE                       |                | 120               | -                    | -                    |
| 01_F031_STORAGE                       |                | 120               | -                    | -                    |
| 01_F032_STORAGE                       |                | 120               | -                    | -                    |
| 01_F038_CL STORE                      |                | 120               | -                    | -                    |
| 01_F039_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F040_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F041_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F042_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F043_STAFF SH & WC                 |                | 120               | -                    | -                    |
| 01_F044_AWC                           |                | 120               | -                    | -                    |
| 01_F045_SERVER ROOM                   |                | 120               | -                    | -                    |
| 01_F046_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F047_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F048_MAIN CIRCULATION              |                | 120               | -                    | -                    |
| 01_F050_AMPHITHEATRE STEP SEATING     |                | 120               | -                    | -                    |
| 01_G000_LIFT                          |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |

**The spaces in the building should have appropriate passive control measures to limit solar gains in summer**

| Zone                             | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------|--------------------------------|-----------------------|
| 00_G002_MEDICAL INSPECTION ROOM  | N/A                            | N/A                   |
| 00_G003_RECEPTION CLASSROOM      | NO (-9%)                       | NO                    |
| 00_G004_RECEPTION CLASSROOM      | NO (-9.4%)                     | NO                    |
| 00_G005_KS1 CLASSROOM            | NO (-12.9%)                    | NO                    |
| 00_G006_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G007_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G008_KS1 CLASSROOM            | NO (-55.8%)                    | NO                    |
| 00_G009_SSC CLASSROOM            | NO (-50.6%)                    | NO                    |
| 00_G010_SSC CLASSROOM            | NO (-46.4%)                    | NO                    |
| 00_G011_SMALL ART CLASSROOM      | YES (+9.8%)                    | NO                    |
| 00_G012_MAIN HALL                | N/A                            | N/A                   |
| 00_G013_SMALL GROUP              | NO (-59.8%)                    | NO                    |
| 00_G014_SMALL GROUP              | NO (-37%)                      | NO                    |
| 00_G015_SMALL GROUP              | NO (-86.4%)                    | NO                    |
| 00_G016_SENSORY ROOM             | N/A                            | N/A                   |
| 00_G017_SSC RESOURCE BASE        | N/A                            | N/A                   |
| 00_G018_SMALL GROUP              | N/A                            | N/A                   |
| 00_G019_QUIET SPACE              | NO (-99.8%)                    | NO                    |
| 00_G020_GENERAL OFFICE RECEPTION | N/A                            | N/A                   |
| 00_G024_INTERVIEW ROOM           | N/A                            | N/A                   |
| 00_G025_SICK BAY                 | N/A                            | N/A                   |
| 00_G026_SSC STAFF WORK ROOM      | N/A                            | N/A                   |
| 00_G029_STAFF WORK ROOM          | NO (-88.9%)                    | NO                    |
| 00_G046_STUDIO HALL              | N/A                            | N/A                   |
| 01_F001_KS2 CLASSROOM            | NO (-56.5%)                    | NO                    |
| 01_F002_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F003_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F004_KS2 CLASSROOM            | NO (-60.6%)                    | NO                    |
| 01_F005_KS2 CLASSROOM            | NO (-18.9%)                    | NO                    |
| 01_F006_KS2 CLASSROOM            | NO (-9.1%)                     | NO                    |
| 01_F007_KS2 CLASSROOM            | NO (-9.4%)                     | NO                    |
| 01_F008_KS2 CLASSROOM            | NO (-11.3%)                    | NO                    |
| 01_F009_SCIENCE ICT CLASSROOM    | YES (+31.7%)                   | NO                    |
| 01_F010_LIBRARY                  | NO (-37.8%)                    | NO                    |
| 01_F011_SEND RESOURCE BASE       | NO (-87.3%)                    | NO                    |
| 01_F012_SMALL GROUP              | NO (-13.2%)                    | NO                    |
| 01_F013_SMALL GROUP              | NO (-94.4%)                    | NO                    |
| 01_F014_LIFE SKILLS ROOM         | YES (+25.5%)                   | NO                    |

| Zone                              | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------------------------|--------------------------------|-----------------------|
| 01_F015_STAFF ROOM                | NO (-46%)                      | NO                    |
| 01_F016_STAFF PPA ROOM            | NO (-42.3%)                    | NO                    |
| 01_F017_HT OFFICE                 | NO (-12%)                      | NO                    |
| 01_F018_REPROGRAPHICS             | N/A                            | N/A                   |
| 01_F045_SERVER ROOM               | N/A                            | N/A                   |
| 01_F050 AMPHITHEATRE STEP SEATING | N/A                            | N/A                   |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |

### Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Were alternative energy systems considered and analysed as part of the design process? | NO |
| Is evidence of such assessment available as a separate submission?                     | NO |
| Are any such measures included in the proposed design?                                 | NO |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 3294.4  | 3294.4   |
| External area [m <sup>2</sup> ]                       | 5669.9  | 5668     |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1289.26 | 1557.81  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.23    | 0.27     |
| Alpha value* [%]                                      | 24.37   | 10       |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

### % Area Building Type

Retail/Financial and Professional Services  
 Restaurants and Cafes/Drinking Establishments/Takeaways  
 Offices and Workshop Businesses  
 General Industrial and Special Industrial Groups  
 Storage or Distribution  
 Hotels  
 Residential Institutions: Hospitals and Care Homes  
 Residential Institutions: Residential Schools  
 Residential Institutions: Universities and Colleges  
 Secure Residential Institutions  
 Residential Spaces  
 Non-residential Institutions: Community/Day Centre  
 Non-residential Institutions: Libraries, Museums, and Galleries  
**100 Non-residential Institutions: Education**  
 Non-residential Institutions: Primary Health Care Building  
 Non-residential Institutions: Crown and County Courts  
 General Assembly and Leisure, Night Clubs, and Theatres  
 Others: Passenger Terminals  
 Others: Emergency Services  
 Others: Miscellaneous 24hr Activities  
 Others: Car Parks 24 hrs  
 Others: Stand Alone Utility Block

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 13.07        | 12.18        |
| Cooling        | 0            | 0            |
| Auxiliary      | 2.51         | 2.26         |
| Lighting       | 4.53         | 7.51         |
| Hot water      | 3.97         | 5.73         |
| Equipment*     | 24.13        | 24.13        |
| <b>TOTAL**</b> | <b>24.08</b> | <b>27.67</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 0        |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 116.65 | 121.82   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 36.37  | 41.57    |
| Total emissions [kg/m <sup>2</sup> ]                | 3.49   | 3.95     |

| HVAC Systems Performance                                                                          |                   |                   |                    |                    |                   |               |               |                  |                  |
|---------------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                       | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 61.6              | 0                 | 6.9                | 0                  | 9.7               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 53                | 0                 | 5.3                | 0                  | 3.9               | 2.78          | 0             | ---              | ---              |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 42.9              | 0                 | 4.8                | 0                  | 1.2               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 52.7              | 0                 | 5.3                | 0                  | 1.2               | 2.78          | 0             | ---              | ---              |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity                 |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 2.59          | 1.97          | 2.64             | 2.64             |
| Notional                                                                                          | 0                 | 0                 | 0                  | 0                  | 0                 | 2.78          | 4.63          | ---              | ---              |
| [ST] Central heating using water: radiators, [HS] GSHP/WSHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 202.5             | 0                 | 22.7               | 0                  | 1.9               | 2.48          | 0             | 2.64             | 0                |
| Notional                                                                                          | 209.7             | 0                 | 21                 | 0                  | 2.1               | 2.78          | 0             | ---              | ---              |
| [ST] No Heating or Cooling                                                                        |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                            | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |
| Notional                                                                                          | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ---              | ---              |

#### Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

## Project name

**F2371TM1122 (Be Clean)**

As designed

Date: Wed Sep 17 14:15:57 2025

## Administrative information

## Building Details

Address: Brookleigh Primary School, Burgess Hill,  
Postcode

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.29

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.29

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 1540.58The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                       |                       |
|---------------------------------------------------------------------------------------|-----------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 3.95                  |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 3.08                  |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m <sup>2</sup> annum            | 41.57                 |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m <sup>2</sup> annum          | 32.24                 |
| Do the building's emission and primary energy rates exceed the targets?               | BER ≤ TER BPER ≤ TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                       | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value         |
|--------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Walls*                               | 0.26                 | 0.15                | 0.15                | 00000036:Surf[12]                        |
| Floors                               | 0.18                 | 0.12                | 0.12                | 0000001F:Surf[0]                         |
| Pitched roofs                        | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                           | 0.18                 | 0.12                | 0.12                | 0000004A:Surf[1]                         |
| Windows** and roof windows           | 1.6                  | 1.1                 | 1.1                 | 00000036:Surf[1]                         |
| Rooflights***                        | 2.2                  | 1.5                 | 1.5                 | 01000011:Surf[0]                         |
| Personnel doors^                     | 1.6                  | 0.34                | 0.34                | 00000036:Surf[10]                        |
| Vehicle access & similar large doors | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors            | 3                    | -                   | -                   | No high usage entrance doors in building |

U<sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 3.07          |

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- htg ASHP clg NONE vent MVHR

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | 0.8           |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 2- htg ASHP clg NONE vent EX

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 3- htg ASHP clg NONE vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 4- htg NONE clg SPLIT vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | 5                  | -                  | -             | -             |
| Standard value                                                                                | 2.5*               | 5                  | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID                                                                                                                                       | System type in the Approved Documents                                 |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| A                                                                                                                                        | Local supply or extract ventilation units                             |
| B                                                                                                                                        | Zonal supply system where the fan is remote from the zone             |
| C                                                                                                                                        | Zonal extract system where the fan is remote from the zone            |
| D                                                                                                                                        | Zonal balanced supply and extract ventilation system                  |
| E                                                                                                                                        | Local balanced supply and extract ventilation units                   |
| F                                                                                                                                        | Other local ventilation units                                         |
| G                                                                                                                                        | Fan assisted terminal variable air volume units                       |
| H                                                                                                                                        | Fan coil units                                                        |
| I                                                                                                                                        | Kitchen extract with the fan remote from the zone and a grease filter |
| NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. |                                                                       |

| Zone name                        | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|----------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                  | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                  | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 00_G002_MEDICAL INSPECTION ROOM  | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G003_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G004_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G005_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G006_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G007_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G008_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G009_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G010_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G011_SMALL ART CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G012_MAIN HALL                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G015_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G016_SENSORY ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G017_SSC RESOURCE BASE        | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G018_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G019_QUIET SPACE              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G020_GENERAL OFFICE RECEPTION | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G024_INTERVIEW ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G025_SICK BAY                 | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G026_SSC STAFF WORK ROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G027_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G028_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G029_STAFF WORK ROOM          | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G046_STUDIO HALL              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G063_DWC & BABY CHANGE        | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G065_KITCHEN PREP & SERVE     | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G067_WC CH                    | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G068_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G069_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G070_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G071_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G072_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G073_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G074_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G075_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G076_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G077_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G078_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G079_STAFF WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G080_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G081_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G083_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G084_HYGIENE ROOM             | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| Zone name                          | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|------------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                    | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                    | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 01_F001_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F002_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F003_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F004_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F005_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F006_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F007_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F008_KS2 CLASSROOM              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F009_SCIENCE ICT CLASSROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F012_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F013_SMALL GROUP                | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F014_LIFE SKILLS ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F016_STAFF PPA ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F018_REPROGRAPHICS              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F039_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F040_PUPIL WCS                  | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F041_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F042_STAFF WC                   | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F043_STAFF SH & WC              | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F044_AWC                        | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F050_AMPHITHEATRE STEP SEATING- | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | -   | 0.5 | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G000_VOID                          |                | 120               | -                    | -                    |
| 00_G002_MEDICAL INSPECTION ROOM       |                | 120               | -                    | -                    |
| 00_G003_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G004_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G005_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G006_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G007_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G008_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G009_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G010_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G011_SMALL ART CLASSROOM           |                | 120               | -                    | -                    |
| 00_G012_MAIN HALL                     |                | 120               | -                    | -                    |
| 00_G012A_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G012B_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 00_G014_SMALL GROUP                   |                | 120               | -                    | -                    |

| General lighting and display lighting  |                | General luminaire | Display light source |                      |
|----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                              |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                        | Standard value | 95                | 80                   | 0.3                  |
| 00_G015_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G016_SENSORY ROOM                   |                | 120               | -                    | -                    |
| 00_G017_SSC RESOURCE BASE              |                | 120               | -                    | -                    |
| 00_G018_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G019_QUIET SPACE                    |                | 120               | -                    | -                    |
| 00_G020_GENERAL OFFICE RECEPTION       |                | 120               | -                    | -                    |
| 00_G022_SCHOOL WAITING AREA            |                | 120               | -                    | -                    |
| 00_G023_NURSERY WAITING AREA           |                | 120               | -                    | -                    |
| 00_G024_INTERVIEW ROOM                 |                | 120               | -                    | -                    |
| 00_G025_SICK BAY                       |                | 120               | -                    | -                    |
| 00_G026_SSC STAFF WORK ROOM            |                | 120               | -                    | -                    |
| 00_G027_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G028_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G029_STAFF WORK ROOM                |                | 120               | -                    | -                    |
| 00_G030_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G031_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G032_G033_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G034_G035_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G036_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G037_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G038_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G039_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G040_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G041_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G042_SPECIALIST STORE               |                | 120               | -                    | -                    |
| 00_G043_LAPTOP TROLLEY STORE           |                | 120               | -                    | -                    |
| 00_G044_PE STORE                       |                | 120               | -                    | -                    |
| 00_G045_EXT PE STORE                   |                | 120               | -                    | -                    |
| 00_G046_STUDIO HALL                    |                | 120               | -                    | -                    |
| 00_G048_SERVERY DINING FURNITURE STORE |                | 120               | -                    | -                    |
| 00_G049_SECURE ARCHIVE STORE           |                | 120               | -                    | -                    |
| 00_G053_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G054_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G055_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G056_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G061_CL STORE                       |                | 120               | -                    | -                    |
| 00_G062_GENERAL STORE                  |                | 120               | -                    | -                    |
| 00_G063_DWC & BABY CHANGE              |                | 120               | -                    | -                    |
| 00_G064_MAINTENANCE STORE              |                | 120               | -                    | -                    |
| 00_G065_KITCHEN PREP & SERVE           |                | 120               | -                    | -                    |
| 00_G066_DRY STORE                      |                | 120               | -                    | -                    |
| 00_G067_WC CH                          |                | 120               | -                    | -                    |
| 00_G068_PUPIL WC                       |                | 120               | -                    | -                    |

| General lighting and display lighting   |                | General luminaire | Display light source |                      |
|-----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                               |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                         | Standard value | 95                | 80                   | 0.3                  |
| 00_G069_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G070_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G071_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G072_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G073_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G074_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G075_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G076_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G077_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G078_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G079_STAFF WC                        |                | 120               | -                    | -                    |
| 00_G080_AWC                             |                | 120               | -                    | -                    |
| 00_G081_AWC                             |                | 120               | -                    | -                    |
| 00_G083_AWC                             |                | 120               | -                    | -                    |
| 00_G084_HYGIENE ROOM                    |                | 120               | -                    | -                    |
| 00_G085_PLANT ELECTRICAL & COLD WATER   |                | 120               | -                    | -                    |
| 00_G086_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G087_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G088_LIFT                            |                | 120               | -                    | -                    |
| 00_G089_ENTRANCE LOBBY                  |                | 120               | -                    | -                    |
| 00_G092_LOBBY                           |                | 120               | -                    | -                    |
| 00_G094_LOBBY                           |                | 120               | -                    | -                    |
| 00_G095_SSC CORRIDOR                    |                | 120               | -                    | -                    |
| 00_G096_MAIN CIRCULATION NORTH          |                | 120               | -                    | -                    |
| 00_G097_MAIN CIRCULATION SOUTH          |                | 120               | -                    | -                    |
| 00_G105_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G106_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G107 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G108 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G109_RISER                           |                | 120               | -                    | -                    |
| 00_G110_RISER                           |                | 120               | -                    | -                    |
| 01_F000_LIGHTWELL OVER MAIN CIRCULATION |                | 120               | -                    | -                    |
| 01_F000_LOBBY TO PLANT DECK             |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID OVER BREAKOUT              |                | 120               | -                    | -                    |
| 01_F000_VOID OVER MAIN HALL             |                | 120               | -                    | -                    |
| 01_F000_VOID OVER STUDIO HALL           |                | 120               | -                    | -                    |
| 01_F001_KS2 CLASSROOM                   |                | 120               | -                    | -                    |
| 01_F002_KS2 CLASSROOM                   |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 01_F003_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F004_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F005_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F006_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F007_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F008_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F009_SCIENCE ICT CLASSROOM         |                | 120               | -                    | -                    |
| 01_F010_LIBRARY                       |                | 120               | -                    | -                    |
| 01_F011_SEND RESOURCE BASE            |                | 120               | -                    | -                    |
| 01_F012_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F014_LIFE SKILLS ROOM              |                | 120               | -                    | -                    |
| 01_F015_STAFF ROOM                    |                | 120               | -                    | -                    |
| 01_F016_STAFF PPA ROOM                |                | 120               | -                    | -                    |
| 01_F017_HT OFFICE                     |                | 120               | -                    | -                    |
| 01_F018_REPROGRAPHICS                 |                | 120               | -                    | -                    |
| 01_F019_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F020_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F021_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F022_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F023_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F024_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F025_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F026_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F027_SPECIALIST STORE              |                | 120               | -                    | -                    |
| 01_F028_LAPTOP TROLLEY STORE          |                | 120               | -                    | -                    |
| 01_F029_STORAGE                       |                | 120               | -                    | -                    |
| 01_F030_STORAGE                       |                | 120               | -                    | -                    |
| 01_F031_STORAGE                       |                | 120               | -                    | -                    |
| 01_F032_STORAGE                       |                | 120               | -                    | -                    |
| 01_F038_CL STORE                      |                | 120               | -                    | -                    |
| 01_F039_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F040_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F041_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F042_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F043_STAFF SH & WC                 |                | 120               | -                    | -                    |
| 01_F044_AWC                           |                | 120               | -                    | -                    |
| 01_F045_SERVER ROOM                   |                | 120               | -                    | -                    |
| 01_F046_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F047_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F048_MAIN CIRCULATION              |                | 120               | -                    | -                    |
| 01_F050_AMPHITHEATRE STEP SEATING     |                | 120               | -                    | -                    |
| 01_G000_LIFT                          |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |

**The spaces in the building should have appropriate passive control measures to limit solar gains in summer**

| Zone                             | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------|--------------------------------|-----------------------|
| 00_G002_MEDICAL INSPECTION ROOM  | N/A                            | N/A                   |
| 00_G003_RECEPTION CLASSROOM      | NO (-9%)                       | NO                    |
| 00_G004_RECEPTION CLASSROOM      | NO (-9.4%)                     | NO                    |
| 00_G005_KS1 CLASSROOM            | NO (-12.9%)                    | NO                    |
| 00_G006_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G007_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G008_KS1 CLASSROOM            | NO (-55.8%)                    | NO                    |
| 00_G009_SSC CLASSROOM            | NO (-50.6%)                    | NO                    |
| 00_G010_SSC CLASSROOM            | NO (-46.4%)                    | NO                    |
| 00_G011_SMALL ART CLASSROOM      | YES (+9.8%)                    | NO                    |
| 00_G012_MAIN HALL                | N/A                            | N/A                   |
| 00_G013_SMALL GROUP              | NO (-59.8%)                    | NO                    |
| 00_G014_SMALL GROUP              | NO (-37%)                      | NO                    |
| 00_G015_SMALL GROUP              | NO (-86.4%)                    | NO                    |
| 00_G016_SENSORY ROOM             | N/A                            | N/A                   |
| 00_G017_SSC RESOURCE BASE        | N/A                            | N/A                   |
| 00_G018_SMALL GROUP              | N/A                            | N/A                   |
| 00_G019_QUIET SPACE              | NO (-99.8%)                    | NO                    |
| 00_G020_GENERAL OFFICE RECEPTION | N/A                            | N/A                   |
| 00_G024_INTERVIEW ROOM           | N/A                            | N/A                   |
| 00_G025_SICK BAY                 | N/A                            | N/A                   |
| 00_G026_SSC STAFF WORK ROOM      | N/A                            | N/A                   |
| 00_G029_STAFF WORK ROOM          | NO (-88.9%)                    | NO                    |
| 00_G046_STUDIO HALL              | N/A                            | N/A                   |
| 01_F001_KS2 CLASSROOM            | NO (-56.5%)                    | NO                    |
| 01_F002_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F003_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F004_KS2 CLASSROOM            | NO (-60.6%)                    | NO                    |
| 01_F005_KS2 CLASSROOM            | NO (-18.9%)                    | NO                    |
| 01_F006_KS2 CLASSROOM            | NO (-9.1%)                     | NO                    |
| 01_F007_KS2 CLASSROOM            | NO (-9.4%)                     | NO                    |
| 01_F008_KS2 CLASSROOM            | NO (-11.3%)                    | NO                    |
| 01_F009_SCIENCE ICT CLASSROOM    | YES (+31.7%)                   | NO                    |
| 01_F010_LIBRARY                  | NO (-37.8%)                    | NO                    |
| 01_F011_SEND RESOURCE BASE       | NO (-87.3%)                    | NO                    |
| 01_F012_SMALL GROUP              | NO (-13.2%)                    | NO                    |
| 01_F013_SMALL GROUP              | NO (-94.4%)                    | NO                    |
| 01_F014_LIFE SKILLS ROOM         | YES (+25.5%)                   | NO                    |

| Zone                              | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------------------------|--------------------------------|-----------------------|
| 01_F015_STAFF ROOM                | NO (-46%)                      | NO                    |
| 01_F016_STAFF PPA ROOM            | NO (-42.3%)                    | NO                    |
| 01_F017_HT OFFICE                 | NO (-12%)                      | NO                    |
| 01_F018_REPROGRAPHICS             | N/A                            | N/A                   |
| 01_F045_SERVER ROOM               | N/A                            | N/A                   |
| 01_F050 AMPHITHEATRE STEP SEATING | N/A                            | N/A                   |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |

### Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Were alternative energy systems considered and analysed as part of the design process? | NO |
| Is evidence of such assessment available as a separate submission?                     | NO |
| Are any such measures included in the proposed design?                                 | NO |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 3294.4  | 3294.4   |
| External area [m <sup>2</sup> ]                       | 5669.9  | 5668     |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1289.26 | 1557.81  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.23    | 0.27     |
| Alpha value* [%]                                      | 24.37   | 10       |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

### % Area Building Type

Retail/Financial and Professional Services  
 Restaurants and Cafes/Drinking Establishments/Takeaways  
 Offices and Workshop Businesses  
 General Industrial and Special Industrial Groups  
 Storage or Distribution  
 Hotels  
 Residential Institutions: Hospitals and Care Homes  
 Residential Institutions: Residential Schools  
 Residential Institutions: Universities and Colleges  
 Secure Residential Institutions  
 Residential Spaces  
 Non-residential Institutions: Community/Day Centre  
 Non-residential Institutions: Libraries, Museums, and Galleries  
**100 Non-residential Institutions: Education**  
 Non-residential Institutions: Primary Health Care Building  
 Non-residential Institutions: Crown and County Courts  
 General Assembly and Leisure, Night Clubs, and Theatres  
 Others: Passenger Terminals  
 Others: Emergency Services  
 Others: Miscellaneous 24hr Activities  
 Others: Car Parks 24 hrs  
 Others: Stand Alone Utility Block

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 10.78        | 12.18        |
| Cooling        | 0            | 0            |
| Auxiliary      | 2.51         | 2.26         |
| Lighting       | 4.53         | 7.51         |
| Hot water      | 3.55         | 5.73         |
| Equipment*     | 24.13        | 24.13        |
| <b>TOTAL**</b> | <b>21.37</b> | <b>27.67</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 0        |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 116.65 | 121.82   |
| Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ] | 32.24  | 41.57    |
| Total emissions [kg/m <sup>2</sup> ]                | 3.08   | 3.95     |

| HVAC Systems Performance                                                                     |                   |                   |                    |                    |                   |               |               |                  |                  |
|----------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                  | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 61.6              | 0                 | 5.7                | 0                  | 9.7               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 53                | 0                 | 5.3                | 0                  | 3.9               | 2.78          | 0             | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 42.9              | 0                 | 4                  | 0                  | 1.2               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 52.7              | 0                 | 5.3                | 0                  | 1.2               | 2.78          | 0             | ----             | ----             |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity            |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 0                 | 0                 | 0                  | 0                  | 0                 | 3.14          | 3.74          | 3.2              | 5                |
| Notional                                                                                     | 0                 | 0                 | 0                  | 0                  | 0                 | 2.78          | 4.63          | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 202.5             | 0                 | 18.7               | 0                  | 1.9               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 209.7             | 0                 | 21                 | 0                  | 2.1               | 2.78          | 0             | ----             | ----             |
| [ST] No Heating or Cooling                                                                   |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |
| Notional                                                                                     | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ----             | ----             |

#### Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |

## Project name

**F2371TM1123 (Be Green)**

As designed

Date: Wed Sep 17 14:19:18 2025

## Administrative information

## Building Details

Address: Brookleigh Primary School, Burgess Hill,  
Postcode

## Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

## Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.29

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.29

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 1540.58The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 3.95                     |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | -0.13                    |
| Target primary energy rate (TPER), kWh <sub>eq</sub> /m <sup>2</sup> annum            | 41.57                    |
| Building primary energy rate (BPER), kWh <sub>eq</sub> /m <sup>2</sup> annum          | -4.75                    |
| Do the building's emission and primary energy rates exceed the targets?               | BER ≤ TER    BPER ≤ TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                       | U <sub>a-Limit</sub> | U <sub>a-Calc</sub> | U <sub>i-Calc</sub> | First surface with maximum value         |
|--------------------------------------|----------------------|---------------------|---------------------|------------------------------------------|
| Walls*                               | 0.26                 | 0.15                | 0.15                | 00000036:Surf[12]                        |
| Floors                               | 0.18                 | 0.12                | 0.12                | 0000001F:Surf[0]                         |
| Pitched roofs                        | 0.16                 | -                   | -                   | No pitched roofs in building             |
| Flat roofs                           | 0.18                 | 0.12                | 0.12                | 0000004A:Surf[1]                         |
| Windows** and roof windows           | 1.6                  | 1.1                 | 1.1                 | 00000036:Surf[1]                         |
| Rooflights***                        | 2.2                  | 1.5                 | 1.5                 | 01000011:Surf[0]                         |
| Personnel doors^                     | 1.6                  | 0.34                | 0.34                | 00000036:Surf[10]                        |
| Vehicle access & similar large doors | 1.3                  | -                   | -                   | No vehicle access doors in building      |
| High usage entrance doors            | 3                    | -                   | -                   | No high usage entrance doors in building |

U<sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]U<sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]U<sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 3.07          |

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- htg ASHP clg NONE vent MVHR

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | 0.8           |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 2- htg ASHP clg NONE vent EX

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 3- htg ASHP clg NONE vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | -                  | 0.2                | -             | -             |
| Standard value                                                                                | 2.5*               | N/A                | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

### 4- htg NONE clg SPLIT vent NONE

|                                                                                               | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|-----------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system                                                                                   | 3.2                | 5                  | -                  | -             | -             |
| Standard value                                                                                | 2.5*               | 5                  | N/A                | N/A           | N/A           |
| Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system     |                    |                    |                    |               | YES           |
| * Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. |                    |                    |                    |               |               |

"No HWS in project, or hot water is provided by HVAC system"

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID                                                                                                                                       | System type in the Approved Documents                                 |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| A                                                                                                                                        | Local supply or extract ventilation units                             |
| B                                                                                                                                        | Zonal supply system where the fan is remote from the zone             |
| C                                                                                                                                        | Zonal extract system where the fan is remote from the zone            |
| D                                                                                                                                        | Zonal balanced supply and extract ventilation system                  |
| E                                                                                                                                        | Local balanced supply and extract ventilation units                   |
| F                                                                                                                                        | Other local ventilation units                                         |
| G                                                                                                                                        | Fan assisted terminal variable air volume units                       |
| H                                                                                                                                        | Fan coil units                                                        |
| I                                                                                                                                        | Kitchen extract with the fan remote from the zone and a grease filter |
| NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components. |                                                                       |

| Zone name                        | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|----------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                  | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                  | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 00_G002_MEDICAL INSPECTION ROOM  | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G003_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G004_RECEPTION CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G005_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G006_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G007_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G008_KS1 CLASSROOM            | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G009_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G010_SSC CLASSROOM            | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G011_SMALL ART CLASSROOM      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G012_MAIN HALL                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G015_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G016_SENSORY ROOM             | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G017_SSC RESOURCE BASE        | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G018_SMALL GROUP              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G019_QUIET SPACE              | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G020_GENERAL OFFICE RECEPTION | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G024_INTERVIEW ROOM           | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G025_SICK BAY                 | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G026_SSC STAFF WORK ROOM      | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G027_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G028_KITCHENETTE              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G029_STAFF WORK ROOM          | -                 | -   | -   | 1.1 | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G046_STUDIO HALL              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G063_DWC & BABY CHANGE        | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G065_KITCHEN PREP & SERVE     | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G067_WC CH                    | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G068_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G069_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G070_PUPIL WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G071_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G072_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G073_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G074_SUPERVISABLE WCS         | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G075_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G076_PUPIL WCS                | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G077_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G078_JUNIOR WCS               | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G079_STAFF WC                 | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G080_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G081_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G083_AWC                      | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G084_HYGIENE ROOM             | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| Zone name                          | SFP [W/(l/s)]     |     |     |     |     |   |     |     |     |   | HR efficiency |          |
|------------------------------------|-------------------|-----|-----|-----|-----|---|-----|-----|-----|---|---------------|----------|
|                                    | ID of system type | A   | B   | C   | D   | E | F   | G   | H   | I |               |          |
|                                    | Standard value    | 0.3 | 1.1 | 0.5 | 2.3 | 2 | 0.5 | 0.5 | 0.4 | 1 | Zone          | Standard |
| 01_F001_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F002_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F003_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F004_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F005_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F006_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F007_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F008_KS2 CLASSROOM              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F009_SCIENCE ICT CLASSROOM      | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F012_SMALL GROUP                | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F013_SMALL GROUP                | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F014_LIFE SKILLS ROOM           | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F016_STAFF PPA ROOM             | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F018_REPROGRAPHICS              | -                 | -   | 1.1 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F039_PUPIL WCS                  | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F040_PUPIL WCS                  | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F041_STAFF WC                   | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F042_STAFF WC                   | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F043_STAFF SH & WC              | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F044_AWC                        | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 01_F050_AMPHITHEATRE STEP SEATING- | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |
| 00_G001_NURSERY PLAYROOM           | -                 | -   | 0.5 | -   | -   | - | -   | -   | -   | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G000_VOID                          |                | 120               | -                    | -                    |
| 00_G002_MEDICAL INSPECTION ROOM       |                | 120               | -                    | -                    |
| 00_G003_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G004_RECEPTION CLASSROOM           |                | 120               | -                    | -                    |
| 00_G005_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G006_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G007_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G008_KS1 CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G009_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G010_SSC CLASSROOM                 |                | 120               | -                    | -                    |
| 00_G011_SMALL ART CLASSROOM           |                | 120               | -                    | -                    |
| 00_G012_MAIN HALL                     |                | 120               | -                    | -                    |
| 00_G012A_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G012B_LOBBY_MAIN HALL              |                | 120               | -                    | -                    |
| 00_G013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 00_G014_SMALL GROUP                   |                | 120               | -                    | -                    |

| General lighting and display lighting  |                | General luminaire | Display light source |                      |
|----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                              |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                        | Standard value | 95                | 80                   | 0.3                  |
| 00_G015_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G016_SENSORY ROOM                   |                | 120               | -                    | -                    |
| 00_G017_SSC RESOURCE BASE              |                | 120               | -                    | -                    |
| 00_G018_SMALL GROUP                    |                | 120               | -                    | -                    |
| 00_G019_QUIET SPACE                    |                | 120               | -                    | -                    |
| 00_G020_GENERAL OFFICE RECEPTION       |                | 120               | -                    | -                    |
| 00_G022_SCHOOL WAITING AREA            |                | 120               | -                    | -                    |
| 00_G023_NURSERY WAITING AREA           |                | 120               | -                    | -                    |
| 00_G024_INTERVIEW ROOM                 |                | 120               | -                    | -                    |
| 00_G025_SICK BAY                       |                | 120               | -                    | -                    |
| 00_G026_SSC STAFF WORK ROOM            |                | 120               | -                    | -                    |
| 00_G027_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G028_KITCHENETTE                    |                | 120               | -                    | -                    |
| 00_G029_STAFF WORK ROOM                |                | 120               | -                    | -                    |
| 00_G030_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G031_NURSERY TEACH STORAGE          |                | 120               | -                    | -                    |
| 00_G032_G033_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G034_G035_TEACH STORAGE             |                | 120               | -                    | -                    |
| 00_G036_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G037_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G038_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G039_TEACH STORAGE                  |                | 120               | -                    | -                    |
| 00_G040_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G041_TEACH STORE                    |                | 120               | -                    | -                    |
| 00_G042_SPECIALIST STORE               |                | 120               | -                    | -                    |
| 00_G043_LAPTOP TROLLEY STORE           |                | 120               | -                    | -                    |
| 00_G044_PE STORE                       |                | 120               | -                    | -                    |
| 00_G045_EXT PE STORE                   |                | 120               | -                    | -                    |
| 00_G046_STUDIO HALL                    |                | 120               | -                    | -                    |
| 00_G048_SERVERY DINING FURNITURE STORE |                | 120               | -                    | -                    |
| 00_G049_SECURE ARCHIVE STORE           |                | 120               | -                    | -                    |
| 00_G053_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G054_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G055_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G056_CLOAKROOM STORAGE              |                | 120               | -                    | -                    |
| 00_G061_CL STORE                       |                | 120               | -                    | -                    |
| 00_G062_GENERAL STORE                  |                | 120               | -                    | -                    |
| 00_G063_DWC & BABY CHANGE              |                | 120               | -                    | -                    |
| 00_G064_MAINTENANCE STORE              |                | 120               | -                    | -                    |
| 00_G065_KITCHEN PREP & SERVE           |                | 120               | -                    | -                    |
| 00_G066_DRY STORE                      |                | 120               | -                    | -                    |
| 00_G067_WC CH                          |                | 120               | -                    | -                    |
| 00_G068_PUPIL WC                       |                | 120               | -                    | -                    |

| General lighting and display lighting   |                | General luminaire | Display light source |                      |
|-----------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                               |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                         | Standard value | 95                | 80                   | 0.3                  |
| 00_G069_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G070_PUPIL WC                        |                | 120               | -                    | -                    |
| 00_G071_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G072_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G073_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G074_SUPERVISABLE WCS                |                | 120               | -                    | -                    |
| 00_G075_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G076_PUPIL WCS                       |                | 120               | -                    | -                    |
| 00_G077_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G078_JUNIOR WCS                      |                | 120               | -                    | -                    |
| 00_G079_STAFF WC                        |                | 120               | -                    | -                    |
| 00_G080_AWC                             |                | 120               | -                    | -                    |
| 00_G081_AWC                             |                | 120               | -                    | -                    |
| 00_G083_AWC                             |                | 120               | -                    | -                    |
| 00_G084_HYGIENE ROOM                    |                | 120               | -                    | -                    |
| 00_G085_PLANT ELECTRICAL & COLD WATER   |                | 120               | -                    | -                    |
| 00_G086_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G087_STAIRWELL                       |                | 120               | -                    | -                    |
| 00_G088_LIFT                            |                | 120               | -                    | -                    |
| 00_G089_ENTRANCE LOBBY                  |                | 120               | -                    | -                    |
| 00_G092_LOBBY                           |                | 120               | -                    | -                    |
| 00_G094_LOBBY                           |                | 120               | -                    | -                    |
| 00_G095_SSC CORRIDOR                    |                | 120               | -                    | -                    |
| 00_G096_MAIN CIRCULATION NORTH          |                | 120               | -                    | -                    |
| 00_G097_MAIN CIRCULATION SOUTH          |                | 120               | -                    | -                    |
| 00_G105_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G106_DIST BOARD                      |                | 120               | -                    | -                    |
| 00_G107 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G108 ICT HUB                         |                | 120               | -                    | -                    |
| 00_G109_RISER                           |                | 120               | -                    | -                    |
| 00_G110_RISER                           |                | 120               | -                    | -                    |
| 01_F000_LIGHTWELL OVER MAIN CIRCULATION |                | 120               | -                    | -                    |
| 01_F000_LOBBY TO PLANT DECK             |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_RISER                           |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID                            |                | 120               | -                    | -                    |
| 01_F000_VOID OVER BREAKOUT              |                | 120               | -                    | -                    |
| 01_F000_VOID OVER MAIN HALL             |                | 120               | -                    | -                    |
| 01_F000_VOID OVER STUDIO HALL           |                | 120               | -                    | -                    |
| 01_F001_KS2 CLASSROOM                   |                | 120               | -                    | -                    |
| 01_F002_KS2 CLASSROOM                   |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 01_F003_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F004_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F005_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F006_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F007_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F008_KS2 CLASSROOM                 |                | 120               | -                    | -                    |
| 01_F009_SCIENCE ICT CLASSROOM         |                | 120               | -                    | -                    |
| 01_F010_LIBRARY                       |                | 120               | -                    | -                    |
| 01_F011_SEND RESOURCE BASE            |                | 120               | -                    | -                    |
| 01_F012_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F013_SMALL GROUP                   |                | 120               | -                    | -                    |
| 01_F014_LIFE SKILLS ROOM              |                | 120               | -                    | -                    |
| 01_F015_STAFF ROOM                    |                | 120               | -                    | -                    |
| 01_F016_STAFF PPA ROOM                |                | 120               | -                    | -                    |
| 01_F017_HT OFFICE                     |                | 120               | -                    | -                    |
| 01_F018_REPROGRAPHICS                 |                | 120               | -                    | -                    |
| 01_F019_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F020_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F021_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F022_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F023_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F024_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F025_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F026_TEACH STORAGE                 |                | 120               | -                    | -                    |
| 01_F027_SPECIALIST STORE              |                | 120               | -                    | -                    |
| 01_F028_LAPTOP TROLLEY STORE          |                | 120               | -                    | -                    |
| 01_F029_STORAGE                       |                | 120               | -                    | -                    |
| 01_F030_STORAGE                       |                | 120               | -                    | -                    |
| 01_F031_STORAGE                       |                | 120               | -                    | -                    |
| 01_F032_STORAGE                       |                | 120               | -                    | -                    |
| 01_F038_CL STORE                      |                | 120               | -                    | -                    |
| 01_F039_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F040_PUPIL WCS                     |                | 120               | -                    | -                    |
| 01_F041_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F042_STAFF WC                      |                | 120               | -                    | -                    |
| 01_F043_STAFF SH & WC                 |                | 120               | -                    | -                    |
| 01_F044_AWC                           |                | 120               | -                    | -                    |
| 01_F045_SERVER ROOM                   |                | 120               | -                    | -                    |
| 01_F046_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F047_STAIRWELL                     |                | 120               | -                    | -                    |
| 01_F048_MAIN CIRCULATION              |                | 120               | -                    | -                    |
| 01_F050_AMPHITHEATRE STEP SEATING     |                | 120               | -                    | -                    |
| 01_G000_LIFT                          |                | 120               | -                    | -                    |

| General lighting and display lighting |                | General luminaire | Display light source |                      |
|---------------------------------------|----------------|-------------------|----------------------|----------------------|
| Zone name                             |                | Efficacy [lm/W]   | Efficacy [lm/W]      | Power density [W/m²] |
|                                       | Standard value | 95                | 80                   | 0.3                  |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |
| 00_G001_NURSERY PLAYROOM              |                | 120               | -                    | -                    |

**The spaces in the building should have appropriate passive control measures to limit solar gains in summer**

| Zone                             | Solar gain limit exceeded? (%) | Internal blinds used? |
|----------------------------------|--------------------------------|-----------------------|
| 00_G002_MEDICAL INSPECTION ROOM  | N/A                            | N/A                   |
| 00_G003_RECEPTION CLASSROOM      | NO (-9%)                       | NO                    |
| 00_G004_RECEPTION CLASSROOM      | NO (-9.4%)                     | NO                    |
| 00_G005_KS1 CLASSROOM            | NO (-12.9%)                    | NO                    |
| 00_G006_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G007_KS1 CLASSROOM            | NO (-13.1%)                    | NO                    |
| 00_G008_KS1 CLASSROOM            | NO (-55.8%)                    | NO                    |
| 00_G009_SSC CLASSROOM            | NO (-50.6%)                    | NO                    |
| 00_G010_SSC CLASSROOM            | NO (-46.4%)                    | NO                    |
| 00_G011_SMALL ART CLASSROOM      | YES (+9.8%)                    | NO                    |
| 00_G012_MAIN HALL                | N/A                            | N/A                   |
| 00_G013_SMALL GROUP              | NO (-59.8%)                    | NO                    |
| 00_G014_SMALL GROUP              | NO (-37%)                      | NO                    |
| 00_G015_SMALL GROUP              | NO (-86.4%)                    | NO                    |
| 00_G016_SENSORY ROOM             | N/A                            | N/A                   |
| 00_G017_SSC RESOURCE BASE        | N/A                            | N/A                   |
| 00_G018_SMALL GROUP              | N/A                            | N/A                   |
| 00_G019_QUIET SPACE              | NO (-99.8%)                    | NO                    |
| 00_G020_GENERAL OFFICE RECEPTION | N/A                            | N/A                   |
| 00_G024_INTERVIEW ROOM           | N/A                            | N/A                   |
| 00_G025_SICK BAY                 | N/A                            | N/A                   |
| 00_G026_SSC STAFF WORK ROOM      | N/A                            | N/A                   |
| 00_G029_STAFF WORK ROOM          | NO (-88.9%)                    | NO                    |
| 00_G046_STUDIO HALL              | N/A                            | N/A                   |
| 01_F001_KS2 CLASSROOM            | NO (-56.5%)                    | NO                    |
| 01_F002_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F003_KS2 CLASSROOM            | NO (-22.3%)                    | NO                    |
| 01_F004_KS2 CLASSROOM            | NO (-60.6%)                    | NO                    |
| 01_F005_KS2 CLASSROOM            | NO (-18.9%)                    | NO                    |
| 01_F006_KS2 CLASSROOM            | NO (-9.1%)                     | NO                    |
| 01_F007_KS2 CLASSROOM            | NO (-9.4%)                     | NO                    |
| 01_F008_KS2 CLASSROOM            | NO (-11.3%)                    | NO                    |
| 01_F009_SCIENCE ICT CLASSROOM    | YES (+31.7%)                   | NO                    |
| 01_F010_LIBRARY                  | NO (-37.8%)                    | NO                    |
| 01_F011_SEND RESOURCE BASE       | NO (-87.3%)                    | NO                    |
| 01_F012_SMALL GROUP              | NO (-13.2%)                    | NO                    |
| 01_F013_SMALL GROUP              | NO (-94.4%)                    | NO                    |
| 01_F014_LIFE SKILLS ROOM         | YES (+25.5%)                   | NO                    |

| Zone                              | Solar gain limit exceeded? (%) | Internal blinds used? |
|-----------------------------------|--------------------------------|-----------------------|
| 01_F015_STAFF ROOM                | NO (-46%)                      | NO                    |
| 01_F016_STAFF PPA ROOM            | NO (-42.3%)                    | NO                    |
| 01_F017_HT OFFICE                 | NO (-12%)                      | NO                    |
| 01_F018_REPROGRAPHICS             | N/A                            | N/A                   |
| 01_F045_SERVER ROOM               | N/A                            | N/A                   |
| 01_F050 AMPHITHEATRE STEP SEATING | N/A                            | N/A                   |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |
| 00_G001_NURSERY PLAYROOM          | YES (+1%)                      | NO                    |

### Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |    |
|----------------------------------------------------------------------------------------|----|
| Were alternative energy systems considered and analysed as part of the design process? | NO |
| Is evidence of such assessment available as a separate submission?                     | NO |
| Are any such measures included in the proposed design?                                 | NO |

# Technical Data Sheet (Actual vs. Notional Building)

## Building Global Parameters

|                                                       | Actual  | Notional |
|-------------------------------------------------------|---------|----------|
| Floor area [m <sup>2</sup> ]                          | 3294.4  | 3294.4   |
| External area [m <sup>2</sup> ]                       | 5669.9  | 5668     |
| Weather                                               | LON     | LON      |
| Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa] | 3       | 3        |
| Average conductance [W/K]                             | 1289.26 | 1557.81  |
| Average U-value [W/m <sup>2</sup> K]                  | 0.23    | 0.27     |
| Alpha value* [%]                                      | 24.37   | 10       |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

## Building Use

### % Area Building Type

Retail/Financial and Professional Services  
 Restaurants and Cafes/Drinking Establishments/Takeaways  
 Offices and Workshop Businesses  
 General Industrial and Special Industrial Groups  
 Storage or Distribution  
 Hotels  
 Residential Institutions: Hospitals and Care Homes  
 Residential Institutions: Residential Schools  
 Residential Institutions: Universities and Colleges  
 Secure Residential Institutions  
 Residential Spaces  
 Non-residential Institutions: Community/Day Centre  
 Non-residential Institutions: Libraries, Museums, and Galleries  
**100 Non-residential Institutions: Education**  
 Non-residential Institutions: Primary Health Care Building  
 Non-residential Institutions: Crown and County Courts  
 General Assembly and Leisure, Night Clubs, and Theatres  
 Others: Passenger Terminals  
 Others: Emergency Services  
 Others: Miscellaneous 24hr Activities  
 Others: Car Parks 24 hrs  
 Others: Stand Alone Utility Block

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

|                | Actual       | Notional     |
|----------------|--------------|--------------|
| Heating        | 10.78        | 12.18        |
| Cooling        | 0            | 0            |
| Auxiliary      | 2.51         | 2.26         |
| Lighting       | 4.53         | 7.51         |
| Hot water      | 3.55         | 5.73         |
| Equipment*     | 24.13        | 24.13        |
| <b>TOTAL**</b> | <b>21.37</b> | <b>27.67</b> |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 25.22  | 0        |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 25.22  | 0        |

## Energy & CO<sub>2</sub> Emissions Summary

|                                                     | Actual | Notional |
|-----------------------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m <sup>2</sup> ]       | 116.65 | 121.82   |
| Primary energy [kWh <sub>nc</sub> /m <sup>2</sup> ] | -4.75  | 41.57    |
| Total emissions [kg/m <sup>2</sup> ]                | -0.13  | 3.95     |

| HVAC Systems Performance                                                                     |                   |                   |                    |                    |                   |               |               |                  |                  |
|----------------------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|---------------|---------------|------------------|------------------|
| System Type                                                                                  | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEFF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 61.6              | 0                 | 5.7                | 0                  | 9.7               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 53                | 0                 | 5.3                | 0                  | 3.9               | 2.78          | 0             | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 42.9              | 0                 | 4                  | 0                  | 1.2               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 52.7              | 0                 | 5.3                | 0                  | 1.2               | 2.78          | 0             | ----             | ----             |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity            |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 0                 | 0                 | 0                  | 0                  | 0                 | 3.14          | 3.74          | 3.2              | 5                |
| Notional                                                                                     | 0                 | 0                 | 0                  | 0                  | 0                 | 2.78          | 4.63          | ----             | ----             |
| [ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 202.5             | 0                 | 18.7               | 0                  | 1.9               | 3.01          | 0             | 3.2              | 0                |
| Notional                                                                                     | 209.7             | 0                 | 21                 | 0                  | 2.1               | 2.78          | 0             | ----             | ----             |
| [ST] No Heating or Cooling                                                                   |                   |                   |                    |                    |                   |               |               |                  |                  |
| Actual                                                                                       | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | 0                | 0                |
| Notional                                                                                     | 0                 | 0                 | 0                  | 0                  | 0                 | 0             | 0             | ----             | ----             |

## Key to terms

|                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Heat dem [MJ/m2]  | = Heating energy demand                                                                               |
| Cool dem [MJ/m2]  | = Cooling energy demand                                                                               |
| Heat con [kWh/m2] | = Heating energy consumption                                                                          |
| Cool con [kWh/m2] | = Cooling energy consumption                                                                          |
| Aux con [kWh/m2]  | = Auxiliary energy consumption                                                                        |
| Heat SSEFF        | = Heating system seasonal efficiency (for notional building, value depends on activity glazing class) |
| Cool SSEER        | = Cooling system seasonal energy efficiency ratio                                                     |
| Heat gen SSEFF    | = Heating generator seasonal efficiency                                                               |
| Cool gen SSEER    | = Cooling generator seasonal energy efficiency ratio                                                  |
| ST                | = System type                                                                                         |
| HS                | = Heat source                                                                                         |
| HFT               | = Heating fuel type                                                                                   |
| CFT               | = Cooling fuel type                                                                                   |



## **APPENDIX E – EARLIER PASSIVE DESIGN ANALYSIS (FLOH TN008)**

## **1.0 INTRODUCTION**

This note is one of series associated with the emerging engineering services design philosophy for Brookleigh School.

Through RIBA Stage 2, testing of various façade, fenestration and ventilation approaches was undertaken to assess the performance of the proposals against overheating and comfort metrics. Refer to the RIBA 2 report for the detail on that analysis.

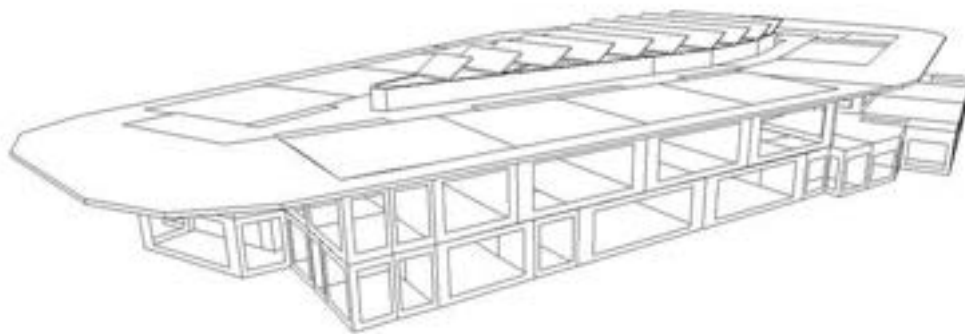
Analysis was undertaken on Oriel (projecting), finned (brise soleil) and flat (no manifestation) glazing options. Oriel glazing performed best overall, yet had the highest incident solar gain. This occurred out of occupied hours so had limited impact on overall performance.

Compliance could be demonstrated using natural ventilation but it was expected that this would evolve into one using a mixed mode approach with 'assisted extract' using buoyancy ducts in the deeper zones of classrooms to aid the draw of air through the space.

A predominantly naturally ventilated approach was developed to balance capital, lifetime and environmental performance considerations.

An example of the base model along with figures showing the finned and Oriel glazing are included below.

**Fig 1.1 Model extracts**



**Base model**



**Finned glazing arrangement**



**Oriel glazing arrangement**

## 1.1 Objective

Potential acoustic constraints were identified towards the end of the RIBA 2 process so application of the strategy was subject to management of external noise impact. It remains possible that the external noise level will be reduced through manifestation such as bunds, walls, fencing and vegetation.

As those interventions have not been decided upon, further analysis has been undertaken to set out performance using a range of approaches, such that the impact of opening windows, or not, can be spelt out.

The key objective here is to identify:

- Whether comfort conditions can be achieved using natural ventilation
- Whether comfort conditions can be achieved using mechanical ventilation

A decision can then be taken by others as to whether acoustic conditions dictate that windows can, or cannot be opened.

## 1.2 Allowable relaxation of internal acoustic requirements

In naturally ventilated spaces BB93 does allow some flexibility on acoustic conditions for the hottest 200 hours of the year during which the indoor noise level limit is less than or equal to 55 dB. Refer to BB93 Table 2, and accompanying note 5, as below:

*Natural, mechanical or hybrid ventilation systems may be used to improve thermal comfort in summer at the expense of higher indoor ambient noise levels. The normal ventilation IANL can be exceeded during the hottest 200 hours in peak summertime conditions and the design should show that IANLs, defined in table 3 can be met under these conditions as well as under normal operation. The ventilation must be under the local control of the teacher so that the noise level can be reduced to normal levels when needed. This does not apply to classrooms intended specifically for students with special hearing and communication needs, or to speech therapy rooms.*

As a simple position, this has been interpreted as allowing windows to be opened for up to 200 hours throughout the year.

None of the natural ventilation approaches had window open periods as low as 200 hours, either for the full year, or the summer only. All options were considerably higher.

**This relaxation as a potential course of action can thus be discounted.**

## 1.3 Analysis

Given the number of models and resultant data from simulations each option was assessed using the finned glazing option since this performed worse than the Oriel glazing at RIBA 2. Once possible approaches were refined, a limited number were then run for the Oriel option. Analysis was grouped into the following sub-sets

- Natural ventilation
- Mechanical ventilation
- Mixed mode.

## 1.4 Carbon performance

Net zero carbon performance associated with regulated energy demands is a DFE requirement and such performance was demonstrated at RIBA 2 for the natural ventilation approach.

Carbon performance analysis will need to be undertaken for any systems using mechanical assistance to ensure that that requirement can still be achieved, and if not what further interventions will be required.

## 2.0 ANALYSIS

Analysis has been undertaken to assess performance under a wide range of conditions. Models have been selected in some cases to test extremes, to avoid numerous incremental stages of analysis.

Key principles are:

- Approximate glazed area of 43%, from SFS information
- Glazing G value of 0.4
- Windows open when internal air temperature is greater than 20 degrees.
- Any passive louvre or night purge is controlled via BMS controlled damper
- NV denotes natural ventilation, MV denotes mechanical ventilation, CLG denotes cooling
- Any mechanical ventilation solutions supply air at outdoor conditions only (no treatment)

### 2.1 Scenarios

Scenario's assessed are as follows

**Table 2.1 Modelling summary**

| Ref. | Model | Windows | Mechanical assistance | Comment |
|------|-------|---------|-----------------------|---------|
|------|-------|---------|-----------------------|---------|

#### Natural ventilation

|   |        |                                   |      |                                                       |
|---|--------|-----------------------------------|------|-------------------------------------------------------|
| 1 | TM902  | Closed                            | None | To represent worst case and provide benchmarking      |
| 2 | TM902A | Open to 20%                       | None | To reflect a 100mm restrictor                         |
| 3 | TM902B | Open to 40%                       | None | Incremental opening, restrictor disengaged.           |
| 4 | TM902C | Open to 60%                       | None | Incremental opening, restrictor disengaged.           |
| 5 | TM902D | Open to 20%, plus acoustic louvre | None | Automatically controlled louvre, to allow night purge |

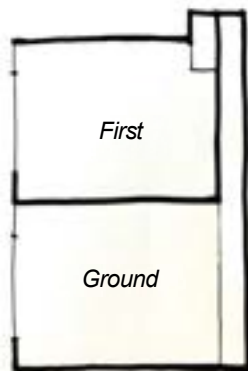
#### Mechanical ventilation

|   |        |        |                              |                                              |
|---|--------|--------|------------------------------|----------------------------------------------|
| 6 | TM902E | Closed | 150 l/s MV                   | Nominal mechanical ventilation               |
| 7 | TM902F | Closed | 150 l/s MV, with night purge | As 6, but with, with night purge             |
| 8 | TM902G | Closed | 300 l/s MV                   | Minimum fresh air via mechanical ventilation |
| 9 | TM902H | Closed | 300 l/s MV, with night purge | As 8, but with, with night purge             |

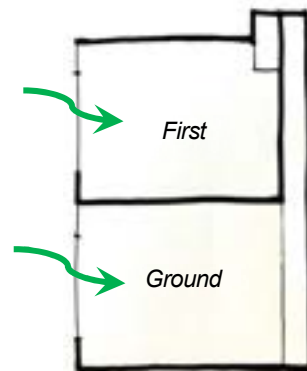
#### Mixed mode

|    |        |             |                           |                                  |
|----|--------|-------------|---------------------------|----------------------------------|
| 10 | TM902I | Closed      | 150 l/s MV, plus 100W CLG | Token cooling provision          |
| 11 | TM902J | Closed      | 150 l/s MV, plus 200W CLG | Increased cooling                |
| 12 | TM902K | Open to 20% | 150 l/s night purge only  | To assess benefit of night purge |
| 13 | TM902L | Closed      | 150 l/s MV, plus 1 kW CLG | Extreme cooling case test        |

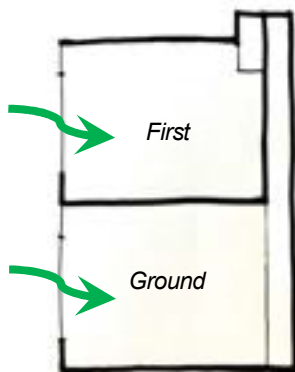
Simple images representing the scenarios are included below.



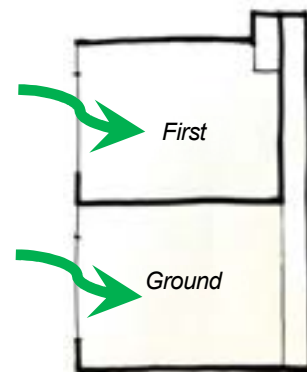
1. Windows closed



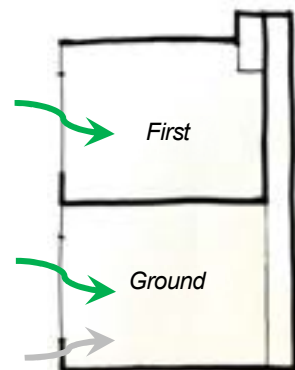
2. Windows open (20%)



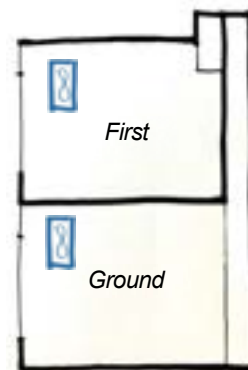
3. Windows open (40%)



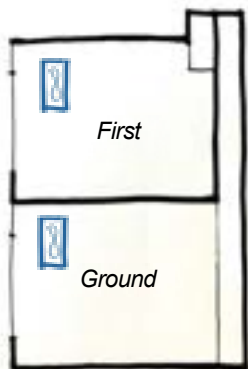
4. Windows open (60%)



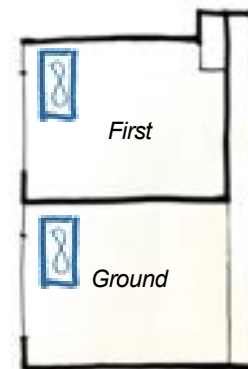
5. Windows open (20%) with acoustic louvre



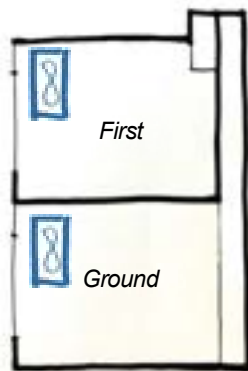
6. Mechanical ventilation (150 l/s)



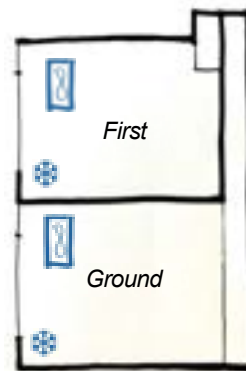
7. Mechanical ventilation (150 l/s) with night purge



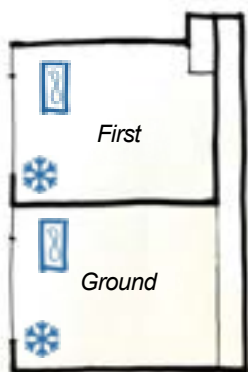
8. Windows Mechanical ventilation (300 l/s)



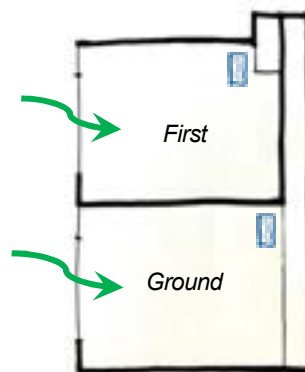
9. Mechanical ventilation (300 l/s) with night purge



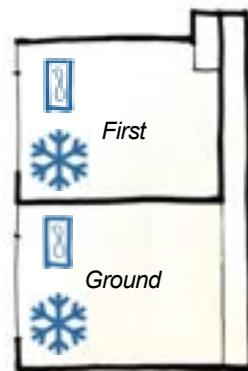
10. Mechanical ventilation (150 l/s) and cooling (100W)



11. Mechanical ventilation (150 l/s) and cooling (200W)



12. Windows open (20%) with mechanical night purge



13. Mechanical ventilation (150 l/s) and cooling (1,000W)

### 3.0 RESULTS

A summary of results is provided below.

Refer to appendix A for a more detailed breakdown of modelling scenarios and results.

Refer to the RIBA 2 report for a summary of the BB101 compliance metrics.

**Table 3.1 Compliance summary**

| Ref. | Model | Basis | Level | BB101 Compliance |   |   |         | CO <sub>2</sub><br>(Ave.) |
|------|-------|-------|-------|------------------|---|---|---------|---------------------------|
|      |       |       |       | 1                | 2 | 3 | Overall |                           |

#### Natural ventilation

|   |        |                                   |   |   |   |   |   |      |
|---|--------|-----------------------------------|---|---|---|---|---|------|
| 1 | TM902  | Windows closed                    | 0 | F | F | F | F | 3019 |
|   |        |                                   | 1 | F | F | F | F | 3019 |
| 2 | TM902A | Open to 20%                       | 0 | P | F | F | F | 666  |
|   |        |                                   | 1 | P | F | P | P | 628  |
| 3 | TM902B | Open to 40%                       | 0 | P | F | F | F | 582  |
|   |        |                                   | 1 | P | F | P | P | 559  |
| 4 | TM902C | Open to 60%                       | 0 | P | F | P | P | 541  |
|   |        |                                   | 1 | P | F | P | P | 525  |
| 5 | TM902D | Open to 20%, plus acoustic louvre | 0 | P | F | F | F | 615  |
|   |        |                                   | 1 | P | F | P | P | 594  |

#### Mechanical ventilation, all windows closed

|   |        |                              |   |   |   |   |   |     |
|---|--------|------------------------------|---|---|---|---|---|-----|
| 6 | TM902E | 150 l/s MV                   | 0 | F | F | F | F | 978 |
|   |        |                              | 1 | F | F | F | F | 978 |
| 7 | TM902F | 150 l/s MV, with night purge | 0 | F | F | F | F | 978 |
|   |        |                              | 1 | F | F | F | F | 978 |
| 8 | TM902G | 300 l/s MV                   | 0 | F | F | F | F | 724 |
|   |        |                              | 1 | F | F | F | F | 724 |
| 9 | TM902H | 300 l/s MV, with night purge | 0 | P | F | F | F | 723 |
|   |        |                              | 1 | P | F | P | P | 723 |

#### Mixed mode approaches

|    |        |                                       |   |   |   |   |   |     |
|----|--------|---------------------------------------|---|---|---|---|---|-----|
| 10 | TM902I | MV (150 l/s) and 100W CLG             | 0 | F | F | F | F | 978 |
|    |        |                                       | 1 | F | F | F | F | 978 |
| 11 | TM902J | MV (150 l/s) and 200W CLG             | 0 | F | F | F | F | 978 |
|    |        |                                       | 1 | F | F | F | F | 978 |
| 12 | TM902K | Windows open to 20%, plus night purge | 0 | P | F | F | F | 686 |
|    |        |                                       | 1 | P | F | P | F | 645 |
| 13 | TM902L | MV (150 l/s), plus 1 kW CLG           | 0 | P | F | P | P | 978 |
|    |        |                                       | 1 | P | P | P | P | 978 |

## 4.0 DISCUSSION

### 4.1 Summary

Outcomes from the analysis are:

- **All** approaches (excluding windows closed) meet air quality criteria.
- Ground floor spaces perform slightly worse than first floor spaces. This is due to additional shading provided by the roof overhang at the upper level.
- Such differences could be reduced through development of the external shading design.
- Overheating compliance **can** be achieved with the natural ventilation approaches
- Mechanical ventilation approaches generally **did not** meet overheating criteria.
- Compliance was only demonstrated for mechanical ventilation approaches with 300 l/s and night purge.
- Minimal cooling provision created a small improvement in conditions.
- Increased cooling of 1 kW, as a test case only, did demonstrate compliance.
- Model 12 which coupled natural ventilation with a mechanical night purge using an assisted extract approach was a marginal fail. It is expected that compliance **could** be demonstrated with this arrangement.
- Model 7 which had the same fixed ventilation rate throughout the day and night as model 12 did not perform as well as model 12. Highlighting the need for increased ventilation through the day.
- Options with Oriel glazing performed better than finned options in each case.

### 4.2 Options

Possible approaches are:

If windows can be opened, then:

- a predominantly natural ventilation approach could be adopted.

If windows must be closed, then:

- Mechanical ventilation at or around 300 l/s of outdoor air will be required, or
- Assisted extract at between 150 l/s and 300 l/s with acoustic louvres will be required as an alternative.

### 4.3 Close

As per the original objective, natural ventilation solutions would be appropriate at Brookleigh School. However if windows cannot be opened due to acoustic constraints then mechanical intervention will be essential.

If acoustic constraints cannot be overcome then rather than full mechanically ventilating teaching spaces, it is recommended that a mixed mode approach using assisted extract and acoustic louvres to allow increased daytime ventilation, and night purge, is developed.

Oriel glazed approaches performed better than finned glazing, yet would still require similar interventions to achieve compliance, only to a lesser extent. These marginal gains are extremely important however when trying to prioritise passive means.

Values above are not prescriptive and will be refined as the chosen solution is developed.



## **APPENDIX A – RIBA 3 THERMAL COMFORT ANALYSIS, ASSESSMENT OVERVIEW**



RIBA 3 THERMAL COMFORT ANALYSIS, ASSESSMENT OVERVIEW

Project: Brookleigh School  
Reference: F2371-BPS-CAL-0003  
Date: 29 April 2025  
Revision: -

|          |              |      |               |                 | Top windows |           |     |                 |                               |                     |       |                 | Mid windows |           |     |                 |                               |                     |       |                 |
|----------|--------------|------|---------------|-----------------|-------------|-----------|-----|-----------------|-------------------------------|---------------------|-------|-----------------|-------------|-----------|-----|-----------------|-------------------------------|---------------------|-------|-----------------|
| Calc ref | Model number | Room | % Glazed area | Glazing g-value | Size        | Area (m2) | No. | Area total (m2) | Openable free area total (m2) | Openable extent (%) | Basis | Opening profile | Size        | Area (m2) | No. | Area total (m2) | Openable free area total (m2) | Openable extent (%) | Basis | Opening profile |

Flat façade with 500mm deep fins

Natural ventilation

|        |   |        |    |     |            |       |   |       |       |     |                  |                 |           |      |   |      |       |     |                  |                 |
|--------|---|--------|----|-----|------------|-------|---|-------|-------|-----|------------------|-----------------|-----------|------|---|------|-------|-----|------------------|-----------------|
| TM902  | 1 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |
| TM902A | 2 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 | 1.551 | 24% | 150mm restrictor | ta>20 0900-1600 |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 | 2.068 | 24% | 150mm restrictor | ta>20 0900-1600 |
| TM902B | 3 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 |       | 40% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 |       | 40% | 150mm restrictor | ta>20 0900-1600 |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 |       | 40% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 |       | 40% | 150mm restrictor | ta>20 0900-1600 |
| TM902C | 4 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 |       | 60% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 |       | 60% | 150mm restrictor | ta>20 0900-1600 |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 |       | 60% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 |       | 60% | 150mm restrictor | ta>20 0900-1600 |
| TM902D | 5 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 | 1.551 | 24% | 150mm restrictor | ta>20 0900-1600 |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 | 2.068 | 24% | 150mm restrictor | ta>20 0900-1600 |

Mechanical ventilation

|        |   |        |    |     |            |       |   |   |   |    |     |     |           |      |   |   |   |    |     |     |
|--------|---|--------|----|-----|------------|-------|---|---|---|----|-----|-----|-----------|------|---|---|---|----|-----|-----|
| TM902E | 6 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 3 | 0 | 0 | 0% | n/a | n/a |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 4 | 0 | 0 | 0% | n/a | n/a |
| TM902F | 7 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 3 | 0 | 0 | 0% | n/a | n/a |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 4 | 0 | 0 | 0% | n/a | n/a |
| TM902G | 8 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 3 | 0 | 0 | 0% | n/a | n/a |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 4 | 0 | 0 | 0% | n/a | n/a |
| TM902H | 9 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 3 | 0 | 0 | 0% | n/a | n/a |
|        |   | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0 | 0 | 0% | n/a | n/a | 1.2Wx1.8H | 2.16 | 4 | 0 | 0 | 0% | n/a | n/a |

Mixed mode approaches

|        |    |        |    |     |            |       |   |       |       |     |                  |                 |           |      |   |      |       |     |                  |                 |
|--------|----|--------|----|-----|------------|-------|---|-------|-------|-----|------------------|-----------------|-----------|------|---|------|-------|-----|------------------|-----------------|
| TM902I | 10 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|        |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |
| TM902J | 11 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|        |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |
| TM902K | 12 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 | 1.551 | 24% | 150mm restrictor | ta>20 0900-1600 |
|        |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 | 2.068 | 24% | 150mm restrictor | ta>20 0900-1600 |
| TM902L | 13 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|        |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |

Oriel Glazing façade

|         |    |        |    |     |            |       |   |       |       |     |                  |                 |           |      |   |      |       |     |                  |                 |
|---------|----|--------|----|-----|------------|-------|---|-------|-------|-----|------------------|-----------------|-----------|------|---|------|-------|-----|------------------|-----------------|
| TM1002D | 5  | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 3 | 6.48 | 1.551 | 24% | 150mm restrictor | ta>20 0900-1600 |
|         |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 3.552 | 0.776 | 22% | 100mm restrictor | ta>20 0900-1600 | 1.2Wx1.8H | 2.16 | 4 | 8.64 | 2.068 | 24% | 150mm restrictor | ta>20 0900-1600 |
| TM1002H | 9  | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|         |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |
| TM1002J | 11 | Ground | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 3 | 0    | 0     | 0%  | n/a              | n/a             |
|         |    | First  | 43 | 0.4 | 1.2Wx0.74H | 0.888 | 4 | 0     | 0     | 0%  | n/a              | n/a             | 1.2Wx1.8H | 2.16 | 4 | 0    | 0     | 0%  | n/a              | n/a             |



RIBA 3 THERMAL COMFORT ANALYSIS, ASSESSMENT OVERVIEW

Project: Brookleigh School  
Reference: F2371-BPS-CAL-0003  
Date: 29 April 2025  
Revision: -

|          |              |      | Louvre |           |     |                 |                     |                 | Vent / clg        |                  |                       | BB101 Natural mode |            |            |            |            |            |                   |                   | BB101 Mechanical mode |           |                   |  |
|----------|--------------|------|--------|-----------|-----|-----------------|---------------------|-----------------|-------------------|------------------|-----------------------|--------------------|------------|------------|------------|------------|------------|-------------------|-------------------|-----------------------|-----------|-------------------|--|
| Calc ref | Model number | Room | Size   | Area (m2) | No. | Area total (m2) | Free area total (%) | Opening profile | MV (Occupied hrs) | MV (Night purge) | Cooling (W) (limited) | Criteria 1         | Criteria 2 | Criteria 3 | Criteria 1 | Criteria 2 | Criteria 3 | Overall pass/fail | Max daily average | Hours PMV > +0.5      | Pass/fail | Max daily average |  |
|          |              |      |        |           |     |                 |                     |                 |                   |                  |                       | <40                | <6         | <4         |            |            |            |                   | (<1200 PPM)       |                       |           | (<1000 PPM)       |  |

Flat façade with 500mm deep

Natural ventilation

|        |   |              |                          |                |        |                |            |                                    |              |              |          |            |          |        |        |        |        |        |              |  |  |  |
|--------|---|--------------|--------------------------|----------------|--------|----------------|------------|------------------------------------|--------------|--------------|----------|------------|----------|--------|--------|--------|--------|--------|--------------|--|--|--|
| TM902  | 1 | Ground First | n/a<br>n/a               | n/a<br>n/a     | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | None<br>None | None<br>None | No<br>No | 537<br>512 | 51<br>46 | 9<br>8 | F<br>F | F<br>F | F<br>F | F<br>F | 3019<br>3019 |  |  |  |
| TM902A | 2 | Ground First | 1.2Wx0.74H<br>1.2Wx0.74H | 0.888<br>0.888 | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | None<br>None | None<br>None | No<br>No | 26<br>17   | 17<br>14 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 666<br>628   |  |  |  |
| TM902B | 3 | Ground First | 1.2Wx0.74H<br>1.2Wx0.74H | 0.888<br>0.888 | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | None<br>None | None<br>None | No<br>No | 19<br>11   | 14<br>10 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 582<br>559   |  |  |  |
| TM902C | 4 | Ground First | 1.2Wx0.74H<br>1.2Wx0.74H | 0.888<br>0.888 | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | None<br>None | None<br>None | No<br>No | 16<br>11   | 13<br>10 | 4<br>4 | P<br>P | F<br>F | P<br>P | P<br>P | 541<br>525   |  |  |  |
| TM902D | 5 | Ground First | 1.2Wx0.74H<br>1.2Wx0.74H | 0.888<br>0.888 | 1<br>1 | 0.888<br>0.888 | 50%<br>50% | ta>20 0000-2400<br>ta>20 0000-2400 | None<br>None | None<br>None | No<br>No | 19<br>12   | 14<br>10 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 615<br>594   |  |  |  |

Mechanical ventilation

|        |   |              |            |            |        |        |          |            |                    |                    |          |            |          |        |        |        |        |        |            |            |        |            |
|--------|---|--------------|------------|------------|--------|--------|----------|------------|--------------------|--------------------|----------|------------|----------|--------|--------|--------|--------|--------|------------|------------|--------|------------|
| TM902E | 6 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 150 l/s<br>150 l/s | None<br>None       | No<br>No | 161<br>144 | 31<br>28 | 7<br>6 | F<br>F | F<br>F | F<br>F | F<br>F | 978<br>978 | 435<br>425 | F<br>F | 980<br>980 |
| TM902F | 7 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 150 l/s<br>150 l/s | 150 l/s<br>150 l/s | No<br>No | 56<br>42   | 19<br>16 | 5<br>5 | F<br>F | F<br>F | F<br>F | F<br>F | 978<br>978 | 237<br>237 | F<br>F | 979<br>979 |
| TM902G | 8 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 300 l/s<br>300 l/s | None<br>None       | No<br>No | 70<br>58   | 24<br>21 | 6<br>5 | F<br>F | F<br>F | F<br>F | F<br>F | 724<br>724 | 243<br>241 | F<br>F | 724<br>724 |
| TM902H | 9 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 300 l/s<br>300 l/s | 300 l/s<br>300 l/s | No<br>No | 12<br>11   | 13<br>10 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 723<br>723 | 95<br>93   | F<br>F | 724<br>724 |

Mixed mode approaches

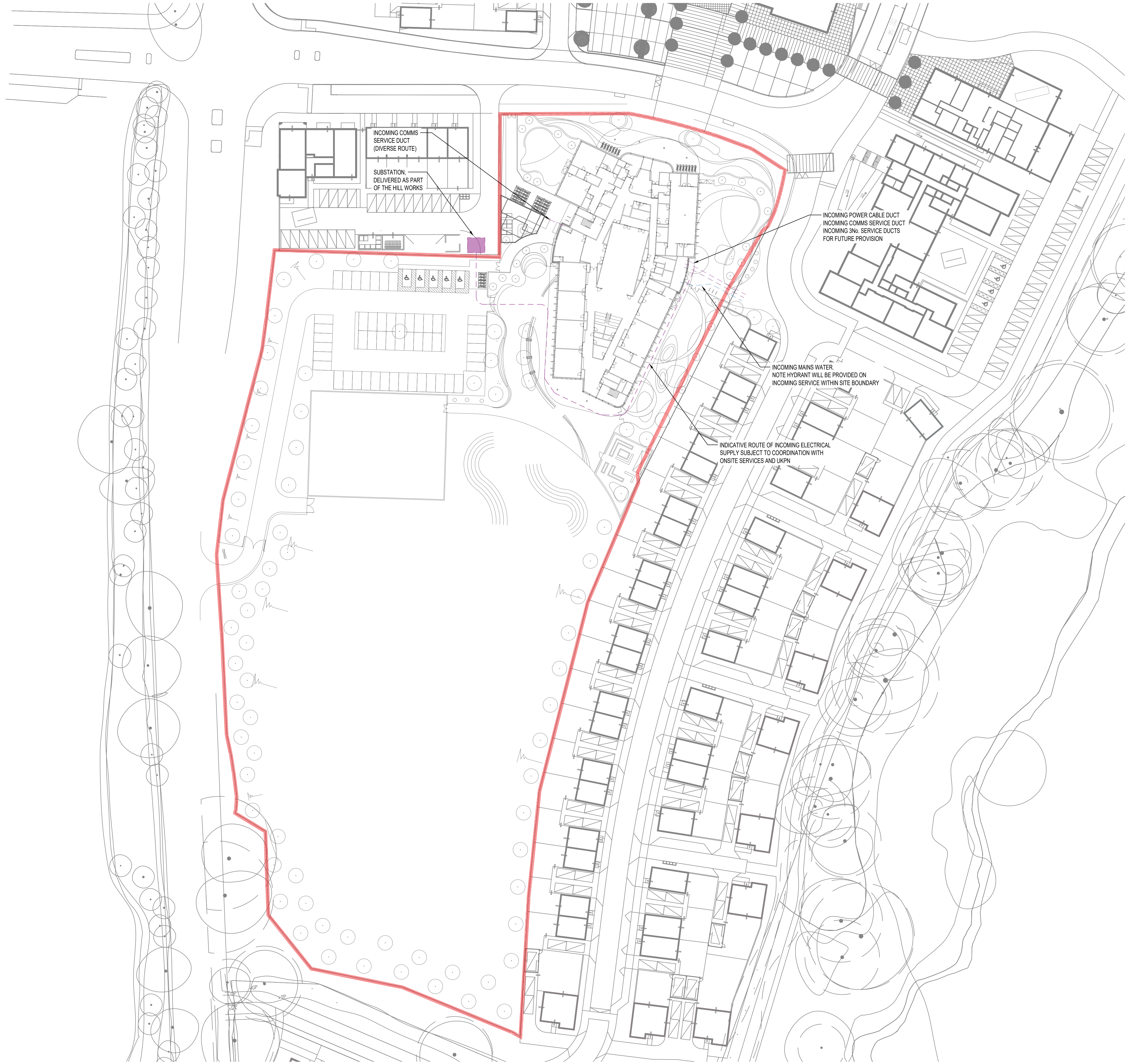
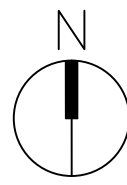
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|--------|----|--------------|------------|------------|--------|--------|----------|------------|--------------------|--------------------|--------------|------------|----------|--------|--------|--------|--------|--------|------------|------------|--------|--------------|
| TM902I | 10 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 150 l/s<br>150 l/s | None<br>None       | 100<br>100   | 132<br>115 | 31<br>26 | 7<br>6 | F<br>F | F<br>F | F<br>F | F<br>F | 978<br>978 | 408<br>394 | F<br>F | 980<br>980   |
| TM902J | 11 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 150 l/s<br>150 l/s | None<br>None       | 200<br>200   | 109<br>98  | 26<br>22 | 6<br>5 | F<br>F | F<br>F | F<br>F | F<br>F | 978<br>978 | 372<br>361 | F<br>F | 980<br>980   |
| TM902K | 12 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | None<br>None       | 150 l/s<br>150 l/s | No<br>No     | 17<br>10   | 13<br>10 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 686<br>645 | 112<br>96  | F<br>F | 1668<br>1543 |
| TM902L | 13 | Ground First | n/a<br>n/a | n/a<br>n/a | 0<br>0 | 0<br>0 | 0%<br>0% | n/a<br>n/a | 150 l/s<br>150 l/s | None<br>None       | 1000<br>1000 | 17<br>11   | 9<br>6   | 3<br>3 | P<br>P | F<br>P | P<br>P | P<br>P | 978<br>978 | 177<br>159 | F<br>F | 980<br>980   |

Oriel Glazing façade

|         |    |              |                          |                |        |                |            |                                    |                    |                    |            |          |          |        |        |        |        |        |            |            |        |            |
|---------|----|--------------|--------------------------|----------------|--------|----------------|------------|------------------------------------|--------------------|--------------------|------------|----------|----------|--------|--------|--------|--------|--------|------------|------------|--------|------------|
| TM1002D | 5  | Ground First | 1.2Wx0.74H<br>1.2Wx0.74H | 0.888<br>0.888 | 1<br>1 | 0.888<br>0.888 | 50%<br>50% | ta>20 0000-2400<br>ta>20 0000-2400 | None<br>None       | None<br>None       | No<br>No   | 16<br>10 | 14<br>10 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 590<br>601 |            |        |            |
| TM1002H | 9  | Ground First | n/a<br>n/a               | n/a<br>n/a     | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | 300 l/s<br>300 l/s | 300 l/s<br>300 l/s | No<br>No   | 12<br>6  | 10<br>6  | 4<br>3 | P<br>P | F<br>P | P<br>P | P<br>P | 722<br>722 | 75<br>61   | F<br>F | 723<br>723 |
| TM1002J | 11 | Ground First | n/a<br>n/a               | n/a<br>n/a     | 0<br>0 | 0<br>0         | 0%<br>0%   | n/a<br>n/a                         | 150 l/s<br>150 l/s | None<br>None       | 200<br>200 | 34<br>19 | 16<br>11 | 5<br>4 | P<br>P | F<br>F | F<br>P | F<br>P | 974<br>974 | 220<br>205 | F<br>F | 976<br>976 |



## **APPENDIX F – SUPPORTING DRAWINGS**



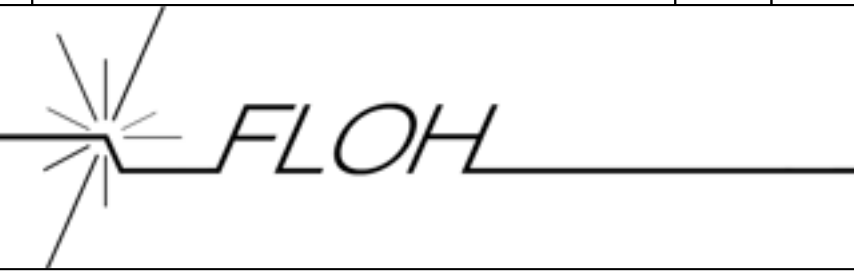
NOTES

- THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

LEGEND

- INCOMING POWER CABLE DUCT
- INCOMING COMMS SERVICE DUCT
- INCOMING 3 No. SERVICE DUCTS FOR FUTURE PROVISION
- INCOMING MAINS WATER

|     |                          |       |          |
|-----|--------------------------|-------|----------|
| P02 | ISSUE FOR PLANNING       | JG    | 13.10.25 |
| P01 | DRAFT ISSUE FOR PLANNING | JG    | 23.09.25 |
| REV | DESCRIPTION              | DRAWN | DATE     |



|   |                                                   |
|---|---------------------------------------------------|
| W | floh.consulting                                   |
| A | 66 Wentworth Street, Spitalfields, London, E1 7BB |

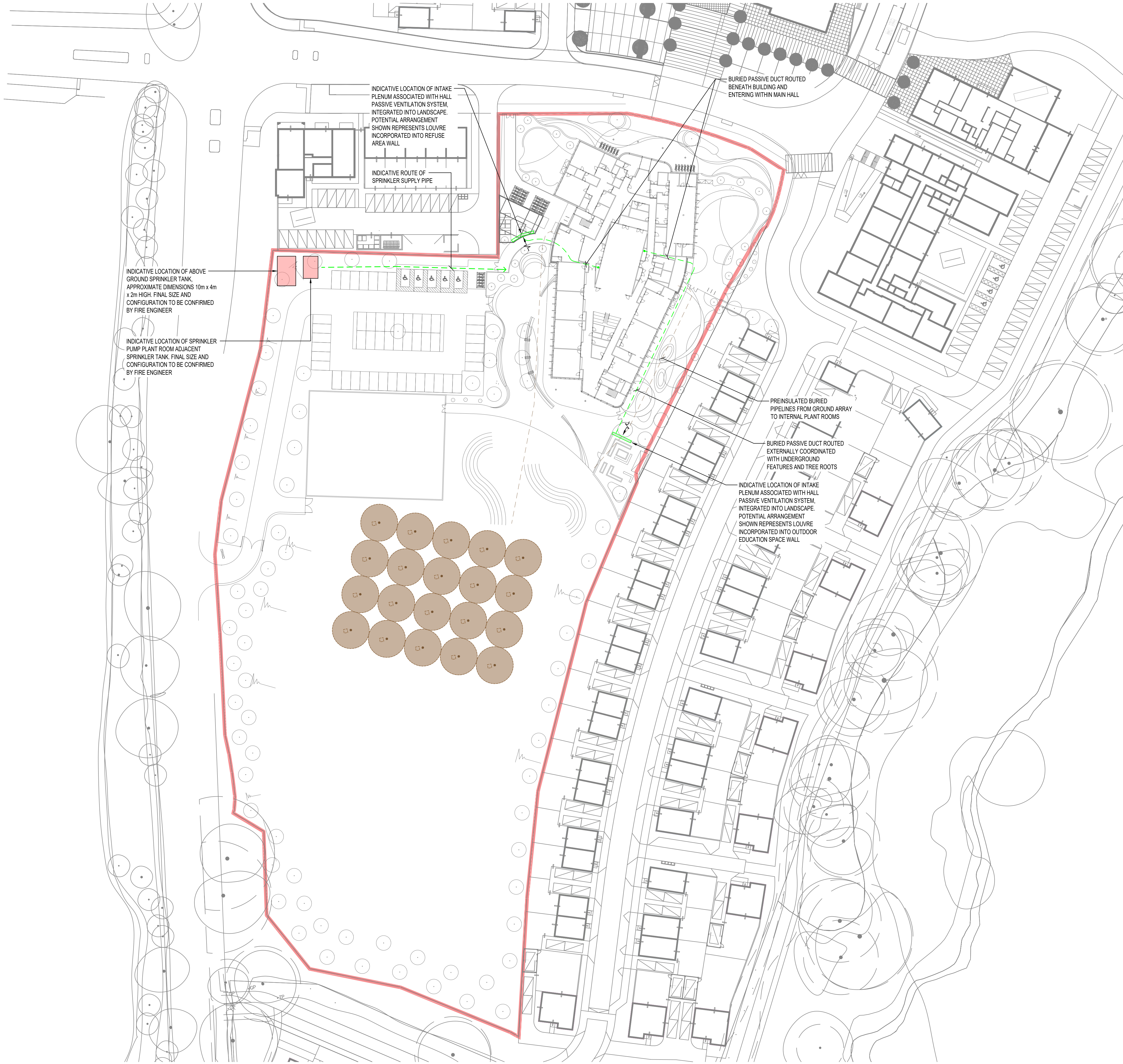
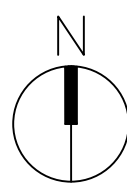
|        |               |
|--------|---------------|
| Client | HOMES ENGLAND |
|--------|---------------|

|           |                 |
|-----------|-----------------|
| Architect | SIX FOOT STUDIO |
|-----------|-----------------|

|              |                   |
|--------------|-------------------|
| Project name | BROOKLEIGH SCHOOL |
|--------------|-------------------|

|               |                                     |
|---------------|-------------------------------------|
| Drawing title | PROPOSED INCOMING SERVICES STRATEGY |
|---------------|-------------------------------------|

|                |                      |                |             |             |                       |               |                |                   |
|----------------|----------------------|----------------|-------------|-------------|-----------------------|---------------|----------------|-------------------|
| Drawn<br>JG    | Date made<br>SEP '25 | Scale<br>1:500 |             | Check<br>MF | Status<br>PRELIMINARY |               |                | FLOH ref<br>F2371 |
| Project<br>BPS | Originator<br>FLOH   | Zone<br>SW     | Level<br>XX | Type<br>DR  | Disc.<br>ME           | Service<br>40 | Number<br>0001 | Rev<br>P02        |



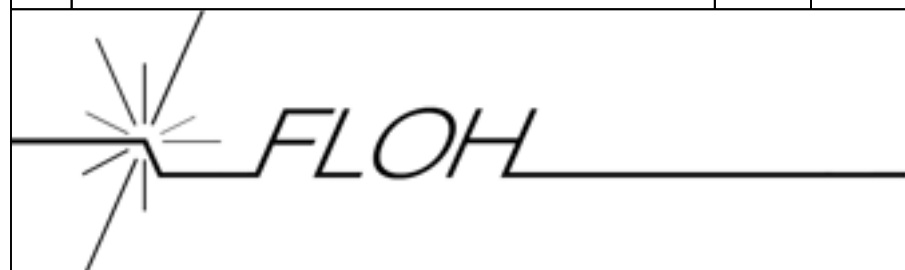
NOTES

1. THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

LEGEND

- APPROXIMATE POSITION OF 200m DEEP PILE WITH 5m PILE SEPARATION ZONE AROUND. 1m x 1m x 1m D VALVE PIT ADJACENT EACH PILE
- PRE-INSULATED BURIED PIPELINES
- PASSIVE BURIED DUCT

|     |                          |       |          |
|-----|--------------------------|-------|----------|
| P02 | ISSUE FOR PLANNING       | JG    | 13.10.25 |
| P01 | DRAFT ISSUE FOR PLANNING | JG    | 23.09.25 |
| REV | DESCRIPTION              | DRAWN | DATE     |



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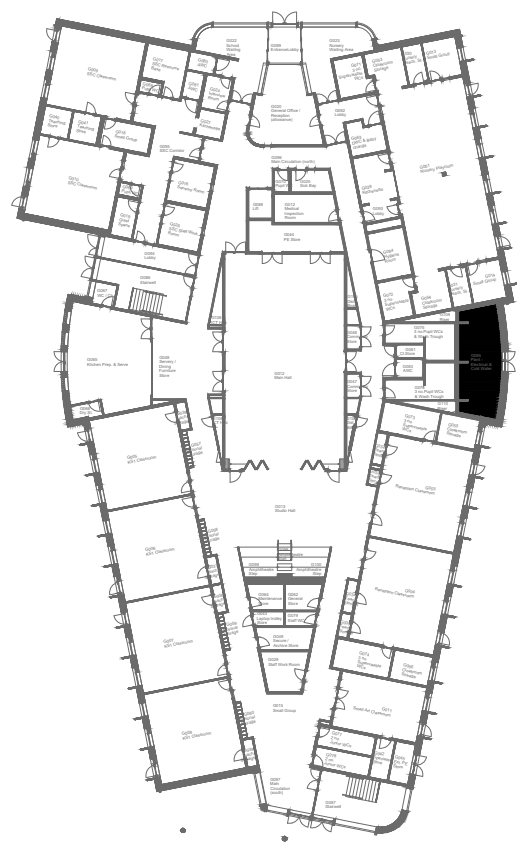
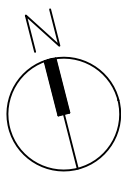
Client  
HOMES ENGLAND

Architect  
SIX FOOT STUDIO

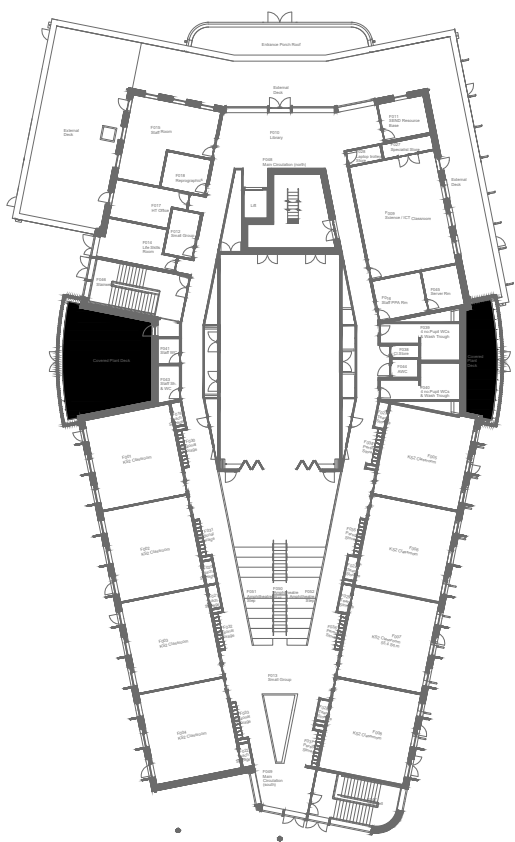
Project name  
BROOKLEIGH SCHOOL

Drawing title  
PROPOSED EXTERNAL SERVICES STRATEGY

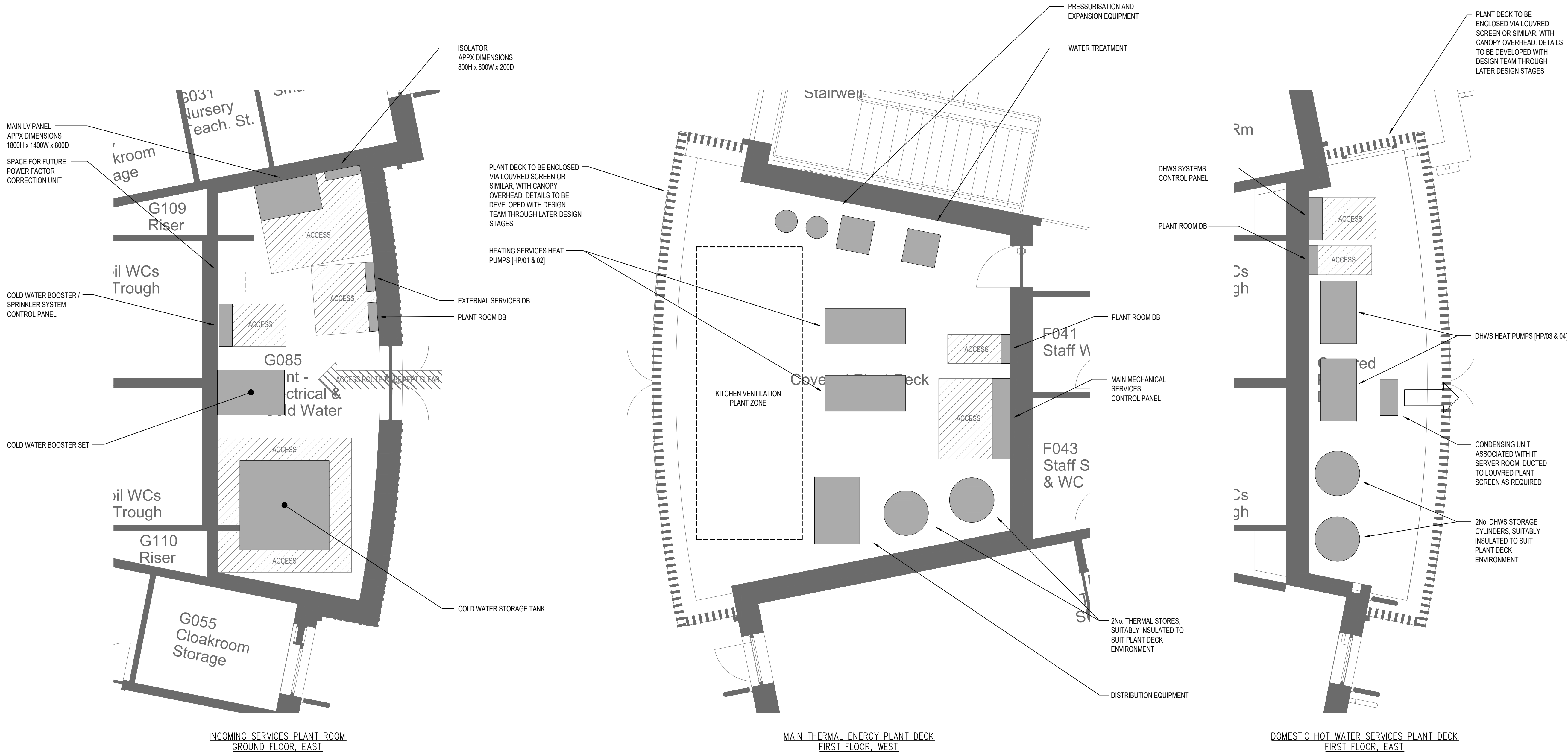
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| Drawn   | Date made  | Scale |       | Check | Status      |         |        | FLOH ref |
| JG      | SEP '25    | 1:500 |       | MF    | PRELIMINARY |         |        | F2371    |
| Project | Originator | Zone  | Level | Type  | Disc.       | Service | Number | Rev      |
| BPS     | FLOH       | SW    | XX    | DR    | ME          | 40      | 0002   | P02      |



KEY PLAN, GROUND FLOOR  
N.T.S.



KEY PLAN, FIRST FLOOR  
N.T.S.



- NOTES
1. THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
  2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
  3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

|     |                          |       |          |
|-----|--------------------------|-------|----------|
| P03 | ISSUE FOR PLANNING       | JG    | 13.10.25 |
| P02 | DRAFT ISSUE FOR PLANNING | JG    | 23.09.25 |
| P01 | STAGE 2 ISSUE            | JG    | 30.01.25 |
| REV | DESCRIPTION              | DRAWN | DATE     |



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Client  
HOMES ENGLAND

Architect  
SIX FOOT STUDIO

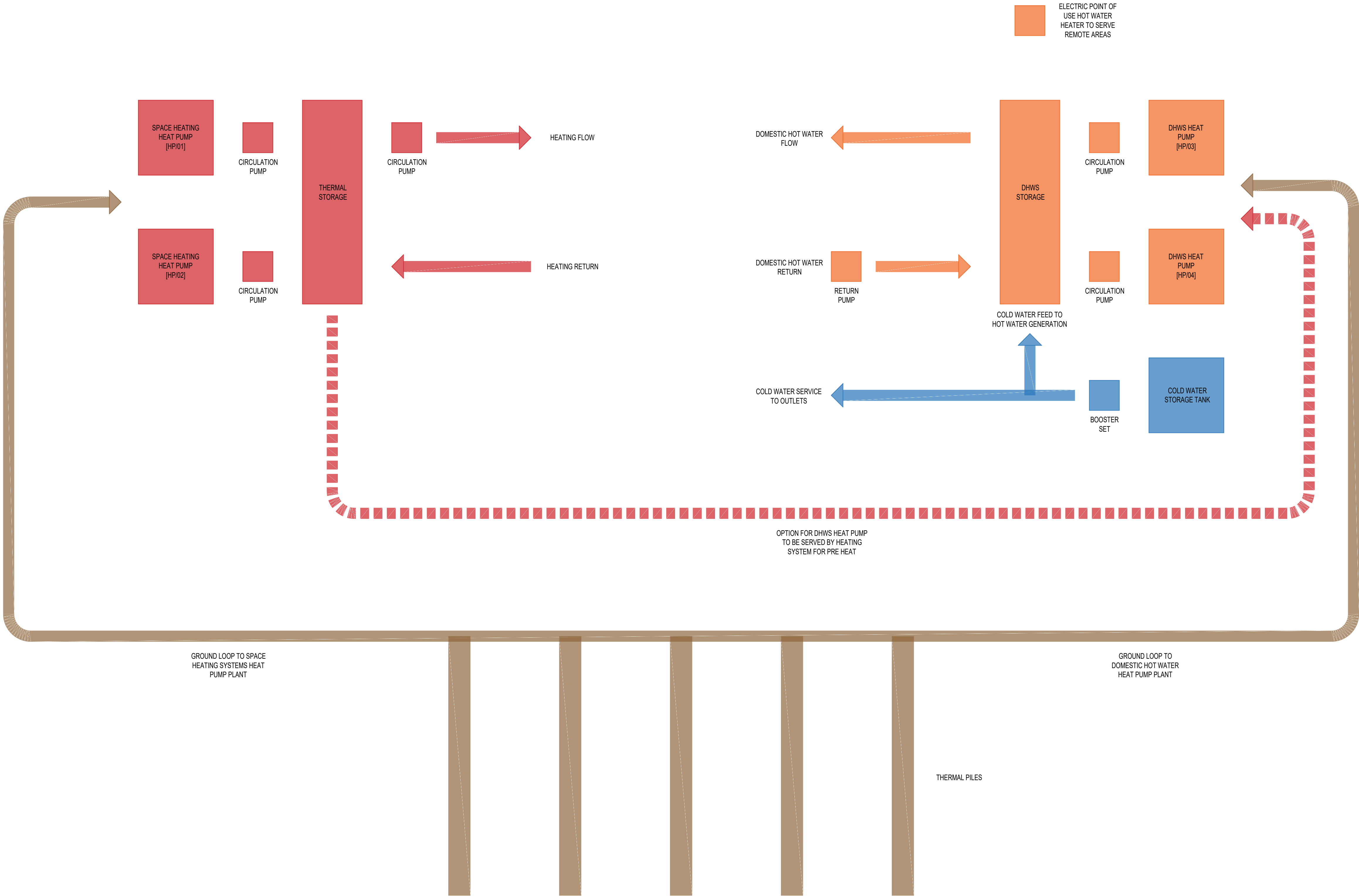
Project name  
BROOKLEIGH SCHOOL

Drawing title  
MECHANICAL ENGINEERING SERVICES  
PROPOSED PLANT SPACE STRATEGY  
GROUND AND FIRST FLOOR

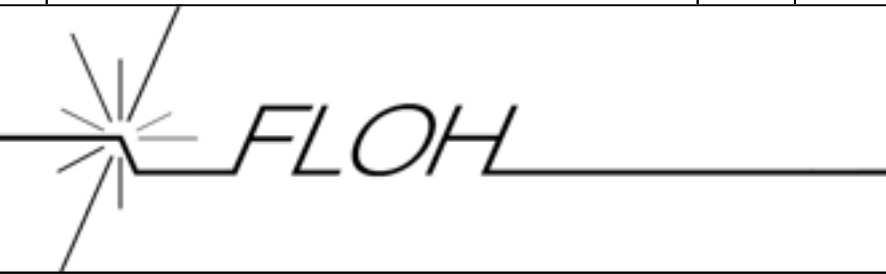
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| Drawn<br>JG    | Date made<br>DEC '24 | Scale<br>1:50 |             | Check<br>MF | Status<br>PRELIMINARY |               |                | FLOH ref<br>F2371 |
| Project<br>BPS | Originator<br>FLOH   | Zone<br>XX    | Level<br>XX | Type<br>DR  | Disc.<br>ME           | Service<br>PR | Number<br>0001 | Rev<br>P03        |

NOTES

1. THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.



|     |                          |       |          |
|-----|--------------------------|-------|----------|
| P03 | ISSUE FOR PLANNING       | JG    | 13.10.25 |
| P02 | DRAFT ISSUE FOR PLANNING | JG    | 23.09.25 |
| P01 | STAGE 2 ISSUE            | JG    | 30.01.25 |
| REV | DESCRIPTION              | DRAWN | DATE     |



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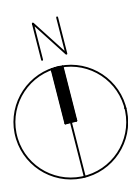
Client  
HOMES ENGLAND

Architect  
SIX FOOT STUDIO

Project name  
BROOKLEIGH SCHOOL

Drawing title  
MECHANICAL ENGINEERING SERVICES  
CONCEPT PLANT STRATEGY SCHEMATIC

|                |                      |                 |             |             |                       |                   |                |            |
|----------------|----------------------|-----------------|-------------|-------------|-----------------------|-------------------|----------------|------------|
| Drawn<br>JG    | Date made<br>JAN '25 | Scale<br>N.T.S. |             | Check<br>MF | Status<br>PRELIMINARY | FLOH ref<br>F2371 |                |            |
| Project<br>BPS | Originator<br>FLOH   | Zone<br>XX      | Level<br>XX | Type<br>SC  | Disc.<br>M            | Service<br>PR     | Number<br>0001 | Rev<br>P03 |

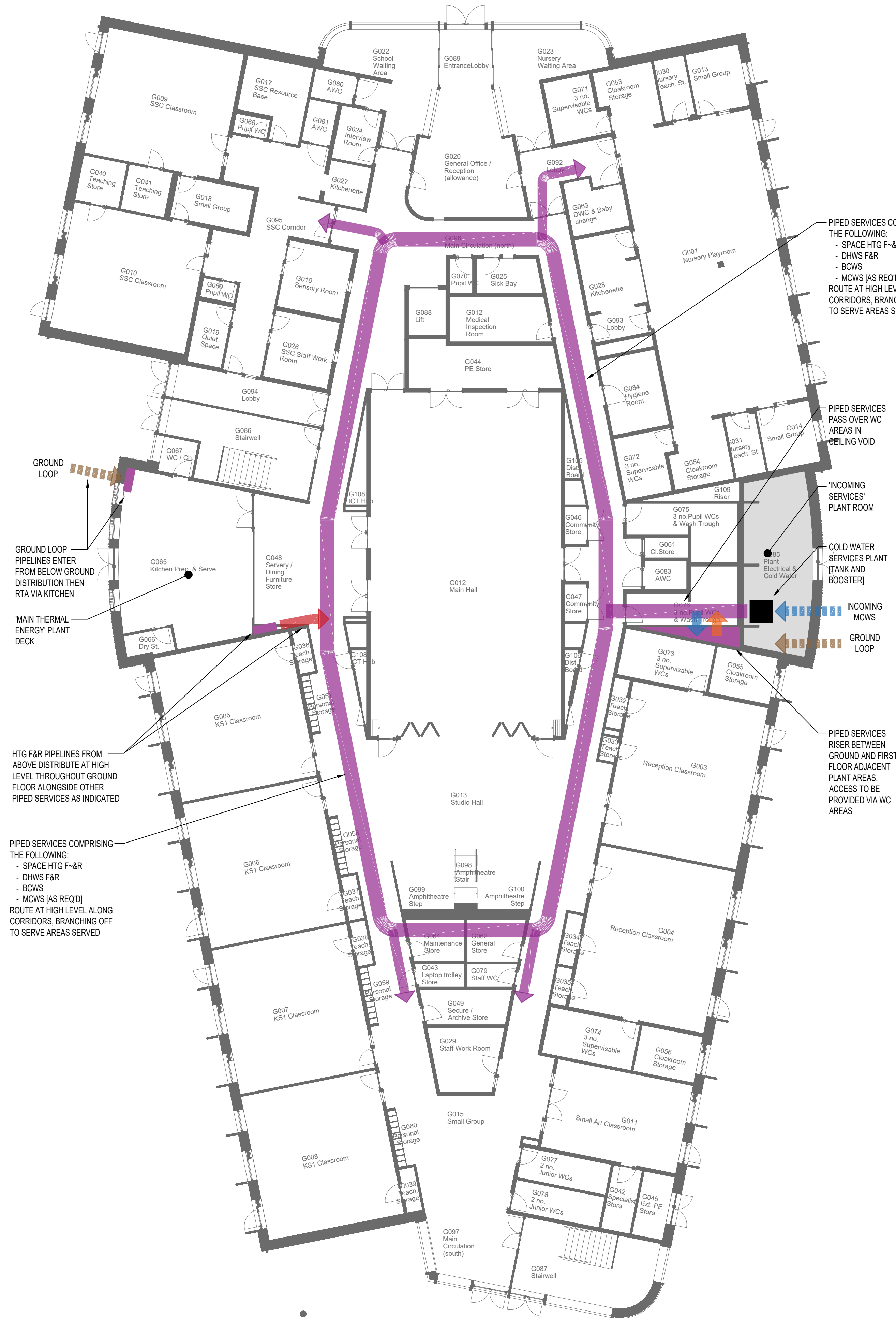


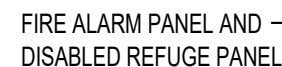
NOTES

1. THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

LEGEND

- COMBINED PIPED SERVICES DISTRIBUTION (AS NOTED)
- COLD WATER SERVICES PIPED DISTRIBUTION
- DOMESTIC HOT WATER SERVICES PIPED DISTRIBUTION
- SPACE HEATING SERVICES PIPED DISTRIBUTION
- GROUND LOOP PIPELINES
- PLANT / EQUIPMENT
- PLANT ROOMS / DECK AREAS
- RISER SPACE





1. THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
3. 3.THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

COMBINED ELECTRICAL SERVICES DISTRIBUTION (AS NOTED)

INCOMING ELECTRICAL SERVICES (POWER, COMMS)

PLANT / EQUIPMENT

PLANT ROOMS / DECK AREAS

RISER SPACE

ELECTRICAL  
SERVICES PASS  
OVER WC AREAS  
IN CEILING VOID

ELECTRICAL SERVICES  
COMPRISING THE FOLLOWING:

- SUB MAINS
- LV TRUNKING
- ELV

ROUTE AT HIGH LEVEL ALONG  
CORRIDORS, BRANCHING OFF  
TO SERVE AREAS SERVED

ELECTRICAL SERVICES TO  
PASS OVER WC AREAS IN  
CEILING VOID

ELECTRICAL SERVICES TO  
ABOVE VIA SERVICE RISER.  
RISER ACCESSED VIA WC  
AREAS

### MAIN ELECTRICAL INCOMER AND SWITCHGEAR

INCOMING

SERVICES

## EXTERNAL SERVICES

INCOMING SERVICES

ELECTRICAL SERVICES —  
COMPRISING THE  
FOLLOWING:

- SUB MAINS
- LV TRUNKING
- ELV

ROUTE AT HIGH LEVEL ALONG  
CORRIDORS, BRANCHING OFF  
TO SERVE AREAS SERVED

ELECTRICAL SERVICES —  
COMPRISING THE  
FOLLOWING:

- SUB MAINS
- LV TRUNKING
- ELV

ROUTE AT HIGH LEVEL ALONG  
CORRIDORS, BRANCHING OFF  
TO SERVE AREAS SERVED

FIRST FLOOR

|     |                          |       |         |
|-----|--------------------------|-------|---------|
| P03 | ISSUE FOR PLANNING       | JG    | 13.10.2 |
| P02 | DRAFT ISSUE FOR PLANNING | JG    | 23.09.2 |
| P01 | STAGE 2 ISSUE            | JG    | 30.01.2 |
| REV | DESCRIPTION              | DRAWN | DATE    |



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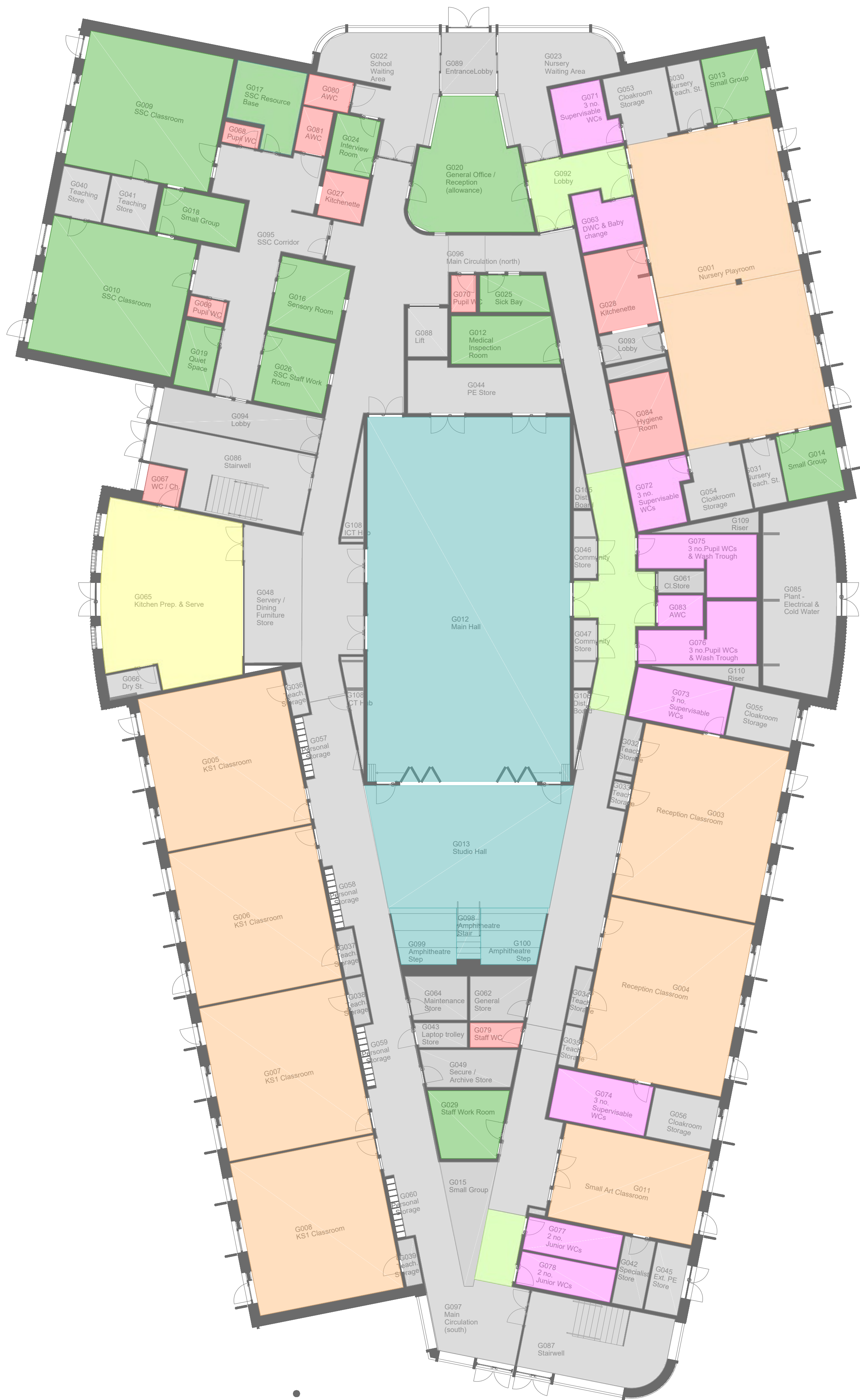
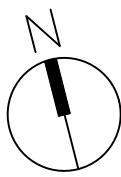
Client  
HOMES ENGLAND

Architect  
SIX FOOT STUDIO

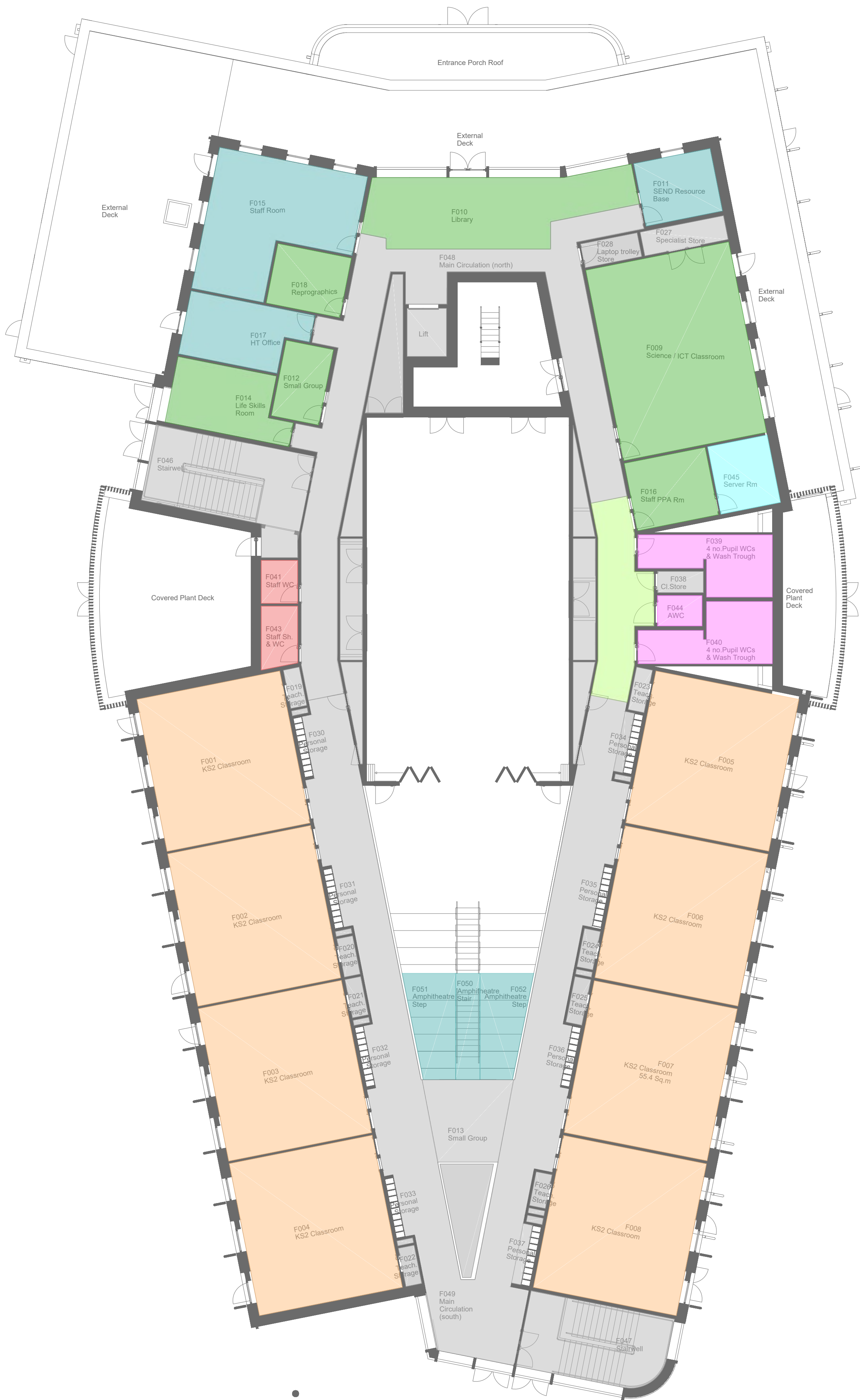
Project name  
BROOKLEIGH SCHOOL

Drawing title  
ELECTRICAL ENGINEERING SERVICES  
DISTRIBUTION STRATEGY  
GROUND AND FIRST FLOOR

|                |                      |                 |             |                       |                   |               |                |            |
|----------------|----------------------|-----------------|-------------|-----------------------|-------------------|---------------|----------------|------------|
| Drawn<br>JG    | Date made<br>JAN '25 | Scale<br>N.T.S. | Check<br>MF | Status<br>PRELIMINARY | FLOH ref<br>F2371 |               |                |            |
| Project<br>BPS | Originator<br>FLOH   | Zone<br>XX      | Level<br>XX | Type<br>DR            | Disc.<br>E        | Service<br>69 | Number<br>0001 | Rev<br>P03 |



GROUND FLOOR



FIRST FLOOR

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A1

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2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED RIBA 2 REPORT
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

LEGEND

- EXTRACT ONLY
- SUPPLY & EXTRACT
- SUPPLY & EXTRACT WITH HEAT RECOVERY
- NATURAL WITH MECHANICAL ASSISTANCE AS REQUIRED
- TOILET AREAS MVHR - EXTRACT
- TOILET AREAS MVHR - SUPPLY
- COMFORT COOLING
- NATURAL (OPENABLE WINDOWS)
- UNTREATED

|     |                                           |       |          |
|-----|-------------------------------------------|-------|----------|
| P03 | DRAFT ISSUE FOR PLANNING                  | JG    | 23.09.25 |
| P02 | SSC IDENTIFIED AS MECHANICALLY VENTILATED | JG    | 12.02.25 |
| P01 | STAGE 2 ISSUE                             | JG    | 30.01.25 |
| REV | DESCRIPTION                               | DRAWN | DATE     |



W A floh.consulting  
66 Wentworth Street, Spitalfields, London, E1 7BB

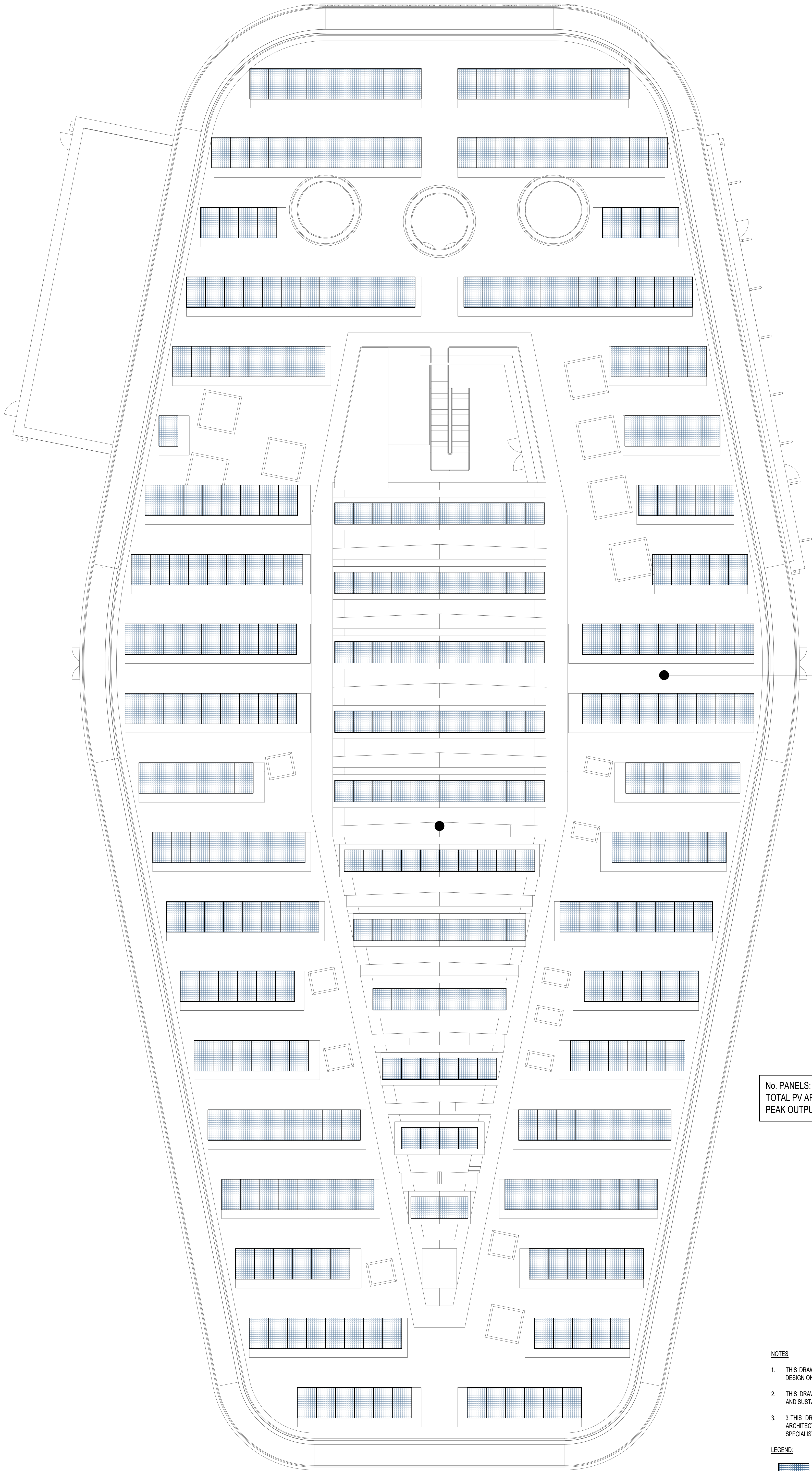
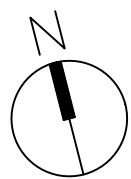
Client  
HOMES ENGLAND

Architect  
SIX FOOT STUDIO

Project name  
BROOKLEIGH SCHOOL

Drawing title  
MECHANICAL ENGINEERING SERVICES  
ENVIRONMENTAL TREATMENT PLAN  
EMERGING VENTILATION STRATEGY  
GROUND AND FIRST FLOOR

|                |                      |                 |             |             |                       |               |                   |            |
|----------------|----------------------|-----------------|-------------|-------------|-----------------------|---------------|-------------------|------------|
| Drawn<br>JG    | Date made<br>JAN '25 | Scale<br>N.T.S. |             | Check<br>MF | Status<br>PRELIMINARY |               | FLOH ref<br>F2371 |            |
| Project<br>BPS | Originator<br>FLOH   | Zone<br>XX      | Level<br>XX | Type<br>ETP | Disc.<br>M            | Service<br>57 | Number<br>0001    | Rev<br>P03 |



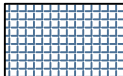
APPROX. 289 No. PANELS (462.4 m<sup>2</sup>)  
MOUNTED AT A SOUTH FACING 5 DEG. PITCH

APPROX. 94 No. PANELS (150.4 m<sup>2</sup>)  
MOUNTED AT A SOUTH FACING 45 DEG. PITCH

No. PANELS: 383  
TOTAL PV AREA: 612 m<sup>2</sup>  
PEAK OUTPUT: 94.3k Wp

- NOTES
- THIS DRAWING IS PRODUCED DURING RIBA STAGE 3 AND SETS OUT CONCEPT DESIGN ONLY.
  - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ASSOCIATED ENERGY AND SUSTAINABILITY STATEMENT
  - 3.THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL ASSOCIATED ARCHITECTURAL AND STRUCTURAL LAYOUTS AS WELL AS ANY OTHER SPECIALIST INFORMATION BY OTHERS.

LEGEND:

 INDICATIVE LOCATION OF PV PANEL



**END OF DOCUMENT**