



**Building Services  
Consulting Engineers**

**MECHANICAL & ELECTRICAL SERVICES  
RIBA STAGE 2 : CONCEPT DESIGN REPORT**

**AT**

**HASKINS FOREST LODGE GARDEN CENTRE  
FARNHAM ROAD  
HOLT POUND  
GU10 4LD**

**FOR**

**BIRDWORLD LTD & HASKINS GARDEN CENTRES LTD**

**JANUARY 2024**



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## **1 EXECUTIVE SUMMARY**

ION Consulting have been employed by Haskins Garden Centres to provide mechanical and electrical design services for the new Garden Centre at Farnham Road, Holt Pound, GU10 4LD, following a 'Design & Build' procurement route.

This RIBA Stage 2 'Concept Design' report is produced in advance of the final RIBA Stage 3 'Developed Design' tender pack to detail and agree the proposed M&E design strategy for the project. A Project Responsibility Matrix is provided in Appendix F of this report.

The proposed design described herein satisfies the local planning conditions, the client brief and incorporates appropriate design measures to ensure that the development complies with Part L of the Building Regulations and BREEAM.

Within the report proposals are provided for:

- New incoming electrical, water and telecoms utility infrastructure concept design to serve the development.
- Mechanical services concept design to serve the development.
- Electrical services concept design to serve the development.

### **Design Summary**

The site will be provided with new electric, water and telecoms infrastructure; however no gas services will be provided to the development.

The proposed development will achieve full compliance with Building Regulations and achieve BREEAM Excellent.

## 2 **PROJECT DESCRIPTION**

### 2.1 **THE WORKS**

#### **Haskins Garden Centres Forest Lodge Current Operations**

Haskins Group Ltd recently purchased the existing garden centre and birdworld attraction located at Holt Pound in February 2020. Haskins currently operate the existing Garden Centre store and the Birdworld attraction. The existing Garden Centre store and Birdworld attraction are located adjacent to one another, the Birdworld site is located towards the north of the Garden Centre and extends down the west of the Garden Centre towards the farm area at the south of the Garden Centre, essentially wrapping the Garden Centre on three sides.



The existing garden centre comprises of a retail area, warehouse, restaurant, survey, external sales area and back of house areas.

Haskins Garden Centres are looking to redevelop the existing garden centre and birdworld sites.

#### **Existing Site**

The existing building condition across both the Garden Centre and Birdworld site are poor. The existing buildings are outdated and don't meet the modern standards expected of today's buildings in respect to insulation, energy performance and sustainability.

The access to each site is via separate entrances from the A325 without dedicated right turn entries.

The Garden Centre deliveries access the service yard via the main carpark creating conflict with pedestrians and customer parking. Long banks of parking encourage increased speed and impact on customer safety.

The existing shape and narrowness of the Birdworld site results in an 'out and back' path structure. This results in poor customer journey and overall experience.

#### **Proposed Redevelopment**

The proposed redevelopment will split the overall site layout north/south for the Birdworld attraction and Garden Centre respectively. The redevelopment comprises of a new play barn building within the bird world site, new garden centre and associated parking, new entrance building to bird world and associated parking, and new living collections buildings for birdworld.

The proposed Garden will comprise of new entrance roundabout from the A325, with a secondary roundabout providing access to the Garden Centre and the new Bird World entrance. The Garden Centre building will comprise of new external car parking, garden centre, external covered sales area and external sales area. The building itself will include offices, warehouse area, retail space, restaurant, servery, conference room, kitchen, and back of house areas, similar to the existing building.

The new Garden Centre building will have a floor area of 5,620m<sup>2</sup>.

The new Birdworld Play Barn building will have a floor area of 1,545m<sup>2</sup>.

The new Birdworld Entrance building will have a floor area of 722m<sup>2</sup>.



The redevelopment works will be split into 3 phases as follows;

- Phase 1. New Birdworld Play Barn Building.
- Phase 2. New Garden Centre Building, carparking, access roundabout and new Birdworld Living Collections Buildings.
- Phase 3. New Birdworld Entrance Building and carparking.

The works are anticipated to occur over the new 3-5 years.

## 2.2 SITE ADDRESS

Haskins Forest Lodge Garden Centre, Farnham Road, Holt Pound, GU10 4LD.

## 2.3 THE CLIENT AND PROJECT TEAM

ION Consulting Engineers are employed by Birdworld & Haskins Garden Centre.

### Current appointments:

Role	Company
Client	Haskins Group Ltd
Project Manager	RPS Group
Quantity Surveyor	RPS Group
Planning Consultant	MD Associates
Civil/Structural Engineer	Scott White & Hookins
Architect & Lead Design	Roberts Limbrick Limited
Highways Engineer	i-Transport LLP
Landscape Architect	The Richards Partnership
Ecology Consultant	Peter Hadfield
Mechanical Engineer	ION Consulting Engineers
Electrical Engineer	ION Consulting Engineers
CDM Principal Designer	Scott White & Hookins
BSA Principal Designer	Roberts Limbrick Limited (TBC)
BREEAM Assessor	RPS Group
Fire Consultant	Part B
Acoustic Consultant	Impact Acoustics

## 2.4 PROGRAMME

An initial programme for the project has been prepared by the Project Manager:

Activity	Date
Appointment	September 2023
Phase 1-3 M&E Stage 2 Design	September 2023 – January 2024
Phase 1 Start on Site	August 2024
Phase 1 Finish on Site	February 2025
Phase 2 Start on Site	January 2026



Phase 2 Finish on Site	December 2026
Phase 3 Start on Site	January 2027
Phase 3 Finish on Site	July 2027

## 2.5 DEVELOPMENT PLANNING STATUS

The planning submission will be made to East Hampshire District Council on 22<sup>nd</sup> January 2024. It's understood the development will need to achieve BREEAM Excellent and adhere to the requirements set within the EHDC Supplementary Planning Document. This document however does not list any absolute planning conditions, although it does advise conditions which may be implemented following the detailed planning submission, the items pertinent to the design of the M&E services are provided in Section 3 of this report.

## 2.6 SITE VISITS

Ryan Dorrington & James Hicks of ION Consulting Engineers have undertaken initial surveys of the Haskins Forest Lodge Garden Centre and Birdworld sites on 17/03/2022, and 27/04/2022.

## 2.7 RECORD INFORMATION

The following record information has been obtained for the site:

- Scottish and Southern Energy Networks Map
- South East Water Map
- South East Water Sewerage Map
- Openreach Telecoms Map
- SGN Gas Map
- Virgin Media Map

Master versions of the above maps are available separately from this document on request.

The client has provided further record information for the site based upon knowledge of the staff; however this information has not been verified. Further surveys are required to determine the extent of the onsite services distribution, these will be undertaken through the Concept Design stage.

## 2.8 PROCUREMENT METHOD

ION Consulting are responsible for taking the project M&E design to RIBA Stage 3 following a design and build procurement route, as per the responsibility matrix in Appendix F of this report.

ION Consulting will prepare a 'Employers Requirements' M&E tender package. The tender package will comprise specifications and concept design drawings.

The services works will be tendered by the chosen Contractors who will engage experienced services Sub-Contractors to design and install the M&E services.

ION Consulting will remain 'Client side' in a 'Checking / Design Guardian' role to monitor the performance of the Contractor through to final project completion at RIBA Stage 6.



### **3 POLICY, REGULATION & CERTIFICATION**

The following section describes the national and local, policy and regulations, and any certification schemes relevant to the project:

#### **3.1 DEVELOPMENT PLANNING CONDITIONS**

East Hampshire District Council have provided their 'Climate Change and Sustainable Construction Supplementary Planning Document – April 2022', for which the development must comply.

The development will comply with the minimum requirements for the following policies;

- CP24 – Sustainable Construction
- CP25 – Flood Risk
- CP26 – Water resource/Water Quality
- CP27 – Pollution
- CP28 – Green Infrastructure
- CP29 – Design
- CP31 – Transport
- CSWB5 – Design
- CSWB6 – Sustainable Construction
- CSWB7 – Waste
- CSWB8 – Sustainable Water Management
- CSWB10 – Green Infrastructure
- CSWB12 – Pedestrian and Cycle Routes
- CSWB13 – Public Transport
- CSWB18 – Low Carbon Vehicles

Other relevant local policy documents include;

- Climate and Environment Strategy 2020-2025
- Hampshire County Councils Climate Change Strategy 2020-2025
- Hampshire County Councils Minerals and waste Plan 2011-2030

#### **3.2 BUILDING REGULATIONS**

##### **Approved Document L: Conservations of Power & Fuel**

The UK is committed to reaching net-zero carbon emissions by 2050. New homes and buildings within England will have to produce significantly less CO<sub>2</sub> to help the country move towards this net-zero target.

The target requirement for the reduction in carbon emissions for new buildings is set within the Building Regulations Approved Document L. Each update to the regulations sets a lower carbon emission target than the previous version to achieve compliance.

Emphasis within the latest 2021 revision to the Building Regulations is on the adoption of a fabric-first approach; with higher minimum fabric standards for the external envelope and improved airtightness. The regulation also introduces a new 'primary energy target' accounting for power station efficiency for electricity, and energy used to produce fuel and deliver it to the building. In addition, a reduction in the carbon factor for electricity means that the use of electrically powered heating systems such as heat pumps are incentivised.

The guidance applies as follows:

- The latest 2021 revision to the Part L Building Regulations applies to all work subject to a building notice, full plans application or initial notice submitted on or after 15<sup>th</sup> June 2022.
- The previous 2018 revision to the Part L Building Regulations applies to work subject to a building notice, full plans application or initial notice submitted before 15<sup>th</sup> June 2022, but only if the works subsequently start on-site before 15<sup>th</sup> June 2023.



### **Approved Document B: Fire Safety**

The Building Regulations Approved Document B is intended to ensure a reasonable standard of life safety in a fire. The protection of property, including the building itself, often requires additional measures beyond that mandated within these regulations.

Additionally, insurers may set higher standards of fire safety before accepting the building insurance risk.

### **Approved Document F: Ventilation**

The Building Regulations Approved Document F is intended to protect the health of occupants of the building by providing adequate ventilation. Without adequate ventilation, mould and internal air pollution may become hazardous to health and the risk of transmission of airborne infection is increased.

### **Approved Document G: Sanitation, Hot Water Safety and Water Efficiency**

The Building Regulations Approved Document G is intended to ensure standards for cold water supply, water efficiency, hot water supply and systems, sanitary conveniences and washing facilities, bathrooms and kitchens and food preparation areas.

### **Approved Document M: Accessibility to and Use of Buildings**

The Building Regulations Approved Document M is intended to ensure that buildings are accessible and usable. Specifically, that people regardless of disability or age should be able to gain access to and within buildings, and use their facilities, both as visitors and as people who work within them.

### **Approved Document S: Infrastructure for Charging Electric Vehicles**

The Building Regulations Approved Document S is intended to ensure that buildings are provided with a minimum level of electric vehicle charging provision.

## **3.3 BREEAM**

BREEAM (Building Research Establishment Environmental Assessment Method) is a comprehensive sustainability assessment method used to evaluate the environmental performance and sustainability of buildings. It considers various factors such as energy efficiency, water usage, materials selection, waste management, and indoor environmental quality. BREEAM provides a framework for measuring and certifying the sustainability achievements of buildings, promoting sustainable design, construction, and operation practices to create more environmentally responsible and healthier built environments.

The proposed development is set to achieve a BREEAM 'Excellent' rating in accordance with EHDC's 'Climate Change and Sustainable Construction Supplementary Planning Document – April 2022'.



#### **4 PROJECT DESIGN PRINCIPLES**

The following section describes the design principles relevant to the project:

##### **4.1 POLICY, REGULATION & CERTIFICATION**

The M&E installation will comply with the full requirements of the following:

- Climate Change and Sustainable Construction Supplementary Planning Document – April 2022'
- BREEAM 'Excellent' rating.
- National Building Regulations Approved Documents.

##### **4.2 INSURERS REQUIREMENTS**

The building insurers will be consulted on the scheme to gain their approval as part of the design process, with particular attention to the fire safety requirements.

##### **4.3 STANDARDS**

The M&E installation will comply with the current versions of the following:

- Relevant British and European Standards
- Relevant CIBSE Design Guides.

##### **4.4 CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2015**

The M&E services design will eliminate foreseeable health and safety risks to anyone affected by the work and, where that is not possible, take steps to reduce or control those risks, including for the installation and future maintenance, repair or removal of fixed services.

##### **4.5 DESIGN LIFE**

The design life for the M&E services installation will be between 15 to 25 years, dependant on individual items of equipment. Reference life expectancy factors for various systems are provided in CIBSE Guide M, Maintenance Engineering and Management, 2014.

##### **4.6 DESIGN FLEXIBILITY**

The M&E services design will allow for flexibility in the arrangement of furniture and equipment within the offices, retail and the restaurant areas.

##### **4.7 RESILIANCE**

The mechanical and electrical systems will be simple to operate, robust in use and also be easy to maintain.

Provision of specialist systems that require unusual skills to operate and maintain will be avoided where possible.

## **5 BUILDING PERFORMANCE MODELLING**

### **5.1 BUILDING REGULATIONS PART L**

A thermal model of the building has been developed in the approved SBEM software, 'IES-VE Feature Pack 2 version 2023.2.0.0' to test compliance with Building Regulations Approved Document L (2021).

Compliance is achieved by performing analysis of the carbon emissions of two buildings:

- The actual building – The building as designed, but subject to standard patterns of occupancy and plant operation.
- The notional building – A version of the building that conforms to the standards defined in the National Calculation Methodology (NCM) Modelling Guide. The notional building is subject to the same occupancy and plant operation patterns as the actual building.

The analysis must demonstrate the following to satisfy compliance with the building regulations:

- That the actual building's carbon emissions and primary energy rates improve on those of the notional building.
- That the performance of building fabric and fixed building services achieve reasonable standards of overall efficiency.
- That spaces in the building have appropriate passive control measures to limit solar gains.

The resulting BRUKL report document is produced to evidence this compliance. It should be noted that the BRUKL report contained within this RIBA Stage 2 report is preliminary only.

A further preliminary BRUKL report will be produced throughout RIBA 'Stage 3 – Spatial Coordination' and RIBA 'Stage 4 - Technical Design' phase to validate the design approach (by the contractor), and a final 'as-built' BRUKL report will be produced (by the contractor) at the completion of RIBA 'Stage 6 - Handover' construction phase. This final report will be provided to building control as evidence of compliance.

#### **Data Input**

The fabric values utilised within the preliminary model are as follows:

Construction Elements U-Values		
	Proposed Building	Notional Building
Floor	0.12W/m <sup>2</sup> .k	0.15W/m <sup>2</sup> .k
Wall	0.15W/m <sup>2</sup> .k	0.18W/m <sup>2</sup> .k
Roof	0.12W/m <sup>2</sup> .k	0.15W/m <sup>2</sup> .k
Windows Glazing (Clear)	1.20W/m <sup>2</sup> .k	1.60W/m <sup>2</sup> .k
Windows Glazing (Tinted)	1.20W/m <sup>2</sup> .k	1.60W/m <sup>2</sup> .k
Rooflight Glazing	1.20W/m <sup>2</sup> .K	2.20W/m <sup>2</sup> .k
Doors (Opaque)	1.30W/m <sup>2</sup> .K	1.60W/m <sup>2</sup> .k
Vehicle Access Door	1.30W/m <sup>2</sup> .K	1.30W/m <sup>2</sup> .K



Solar Transmittance (G-Value)		
	Proposed Building	Notional Building
Window Glazing (Clear)	0.69	0.28
Window Glazing (Tinted)	0.39	0.28
Rooflight Glazing	0.48	0.40
Light Transmittance		
	Proposed Building	Notional Building
Window Glazing (Clear)	0.78	0.6
Window Glazing (Tinted)	0.37	0.6
Rooflight Glazing	0.78	0.71



Air Permeability		
	Proposed Building	Notional Building
Permeability	5m <sup>3</sup> /hr/m <sup>2</sup> @ 50Pa	3m <sup>3</sup> /hr/m <sup>2</sup> @ 50Pa

### Results

The preliminary RIBA Stage 2 'concept design' BRUKL document is provided in Appendix C of this report.

## 5.2 PHOTOVOLTAIC

A model of the building has been developed to analyse the viability of the rooftop areas to accommodate photovoltaic panels with respect to orientation and shading.

### Result

The analysis is based on a monocrystalline panel with an efficiency of 21.1% mounted at a pitch matching that of the roof (22°). It is proposed that PV panels are installed on the south facing roof elevations.

A visual representation of the viability of each roof elevation is provided in Appendix A of this report.

The client has a desire to cover the entire roof where viable with PV to ensure maximum energy yield. As a result the building will have approximately 1300m<sup>2</sup> of PV installed, providing a 78% reduction in BER over TER, therefore providing compliances with Building regulations Part L. The BREEAM pre-assessment requires minimum ENE 01 credits of 7, the proposed PV array for this building, along with the Birdworld buildings achieves 8 credits for ENE01.

The quantity of PV to be installed for the building will be such that the building achieves compliance with Building Regulations Part L with the actual Building Carbon Emissions being 78% below that of the Notional to allow for build tolerances and changes to the fabric properties and also such that the BREEAM ENE01 calculator achieves the targeted credits of 7. The initial BRUKL output document suggests that 1300m<sup>2</sup> of PV will be required on the roof, to achieve compliance with building Regulations Part L & achieve a minimum of 7 BREEAM credits for ENE 01.



## **6 MECHANICAL SERVICES CONCEPT DESIGN**

### **6.1 GAS**

No new incoming gas services will be provided to the new Graden Centre building. The gas service serving the existing Graden Centre will be disconnected and striped out following construction of the new Garden Centre.

There is an existing incoming gas supply serving a number of Birdworld buildings which enters from the A325. The supply is in close proximity to the new play barn building, and therefore it is imperative to undertake a below ground services scan to ensure the gas services does not impose within 1m on the building footprint, otherwise it will require re-routing.

### **6.2 INCOMING MAINS COLD WATER**

#### Existing

The Birdworld and Garden centre site is currently provided with multiple water supplies, splits as follows;

- An existing Birdworld supply enters the site from Gravel Hill Road from the south.
- An existing Birdworld supply enters the site from the A325 just south of the Birdworld main entrance.
- An existing Birdworld supply enters the site from the A325 and serves the Birdworld office building – the supply is un-metered.
- An existing Garden Centre supply enters the site from the A325 towards the south of the Garden Centre car park.
- An existing Garden Centre supply enters the site from the A325 adjacent to the Garden Centre car park entrance.

It should be noted that the 2No. birdworld supplies are cross-connected within the back of the toilet block located within the centre of the site, such that if one supply is disconnected the other will continue to serve the site, subject to flow rate and pressure available. This theory should be tested prior to any permanent disconnections being made.

It's not yet understood exactly which parts of the Garden Centre are served by each supply; further investigations are therefore required.

A below ground services scan of the site is required prior to any works commencing to understand exact services routes.

#### Proposed – Phase 1 (Play Barn)

In Phase 1 a new incoming mains cold water supply and firefighting supply will be taken from the infrastructure within the A325. The incoming mains cold water supply will serve the new Play Barn building but be suitably sized to meet the needs to the entire Birdworld attraction at completion of all phases. A MCWS supply will be extended to the boundary of Phase 3 to serve the entire Birdworld site and the new entrance building in Phase 3 complete with suitable flushing arrangement.

The firefighting supply will be suitable for 25l/s (1500l/min) for a minimum of 30 minutes. A separate supply will enter the site from the A325 to serve a fire hydrant positioned locally to the building and at 90m intervals on the supply. The fire hydrant supply will continue to the boundary of the phase 3 works for future extension.

#### Proposed – Phase 2 (Garden Centre)

In Phase 2 the existing incoming Birdworld supply which enters the site from Gravel Hill Road will be stripped out and disconnected. As a result the existing Birdworld infrastructure will now be served from the single incoming mains water supply from the north of the site. As detailed above, due to the cross-connection on site, the distribution should continue to operate without disruption, subject to adequate flow and pressure from the single remaining supply.

The existing incoming water supply located towards the south of the Garden Centre car park will be stripped out prior to commencement of Phase 2 to allow construction of the new roundabout and entrance. As detailed above, it's not understood which areas of the existing Garden centre this supply serves, ongoing investigations are being undertaken and therefore, a temporary

supply may be required from the other existing Garden Centre supply to serve any areas cut off when this supply is removed.

A new incoming mains cold water supply and firefighting supply will be taken from the infrastructure within the A325 and Gravel Hill Road respectively. The incoming mains cold water supply will serve the new Garden Centre building.

The firefighting supply will be suitable for 25l/s (1500l/min) for a minimum of 30 minutes. A separate supply will enter the site from the Gravel Hill Road (subject to confirmation from the water authority) to serve a fire hydrant positioned locally to the building and at 90m intervals on the supply. The fire hydrant supply will continue to the boundary of the phase 3 works for future extension.

#### Proposed – Phase 3 (Entrance Building & Living Collections)

In Phase 3 the existing incoming water supply serving the Graden Centre from the A325 adjacent to the car park entrance will be disconnected and removed.

The mains cold water service left ready for extension in phase 1 will be extended to serve the new entrance building.

The firefighting supply left ready for extension at the boundary of Phase 1 & 2 will be extended throughout phase 3 to create a private ring main throughout all phases, with a new fire hydrant installed adjacent to the entrance building and at 90m intervals on the ring main.

The Living Collections buildings will be connected to the existing site infrastructure in the local vicinity of the buildings.

The existing Birdworld incoming mains water supply located adjacent to the existing car park entrance will be retained until such time in the future as the remaining buildings are connect to the new supply installed as part of the Phase 1 works.

Note: An application for the above works has been made to South East Water, due to the complexity of the works, the proposals need to be hydraulically modelled to understand the impact on the network. Therefore, any proposals/quotations are anticipated to be returned by March 2024.

Should there be inadequate flow or pressure in the local network, or South East water cannot guarantee the fire hydrant flow rates required, then a 45,000l storage tank will be required to serve both the Garden Centre site and the Birdworld Entrance Building and Play Barn Building.

### **6.3 HEATING**

The building will typically be heated via air source heat pumps.

An air source heat pump system is a versatile solution that provides heating capabilities using electricity as a primary energy source with the efficiency of the refrigeration cycle and heat extraction form the environment to achieve an energy efficient means of heating a building. This system is designed to serve multiple heat emitter solutions, including heating coils, overdoor heaters and underfloor heating.

The air source heat pump system operates by utilising refrigerant to transfer heat. In the heating mode, the refrigerant absorbs heat from the outdoor air and delivers it to the heating coils, overdoor heaters and underfloor heating system.

The heat pump will be connected to a distribution network that serves heating coils, overdoor heaters and underfloor heating. Heating coils within air handling units are responsible for distributing conditioned air. Overdoor heaters will be positioned at the entrances and exits to the main retail areas, to ensure energy is not lost from the building when the doors are opened, but also to provide a quick heat response should some energy be lost. All areas with the exception of the kitchen and associated food prep areas, IT comms rooms, restaurant, servery and IT comms room will be provided with underfloor heating.

Underfloor heating involves a network of pipes installed beneath the floor surface. These pipes circulate warm water during the heating mode, creating a comfortable and even temperature distribution across the floor.

The kitchen and associated food prep areas, restaurant and servery will be provided with heating via their respective air handlings units.





This type of HVAC system offers flexibility and energy efficiency. By utilising an air source heat pump, it can effectively meet the heating needs of the building, while heating coils, overdoor heaters and underfloor heating provide localised temperature control for enhanced comfort.

No heating will be provided to the MEP plant areas.

The air source heat pumps will be positioned externally within a dedicated compound towards the north of the Garden centre adjacent to the warehouse area. All associated plant and equipment will be positioned in the external plantroom positioned towards the south of the building, therefore, buried external heating flow and return pipework will need to route from the air source heat pumps to the mechanical plant room. To ensure adequate air flow to the air source heat pumps, the compound will be louvred. The exact location and technical design of the ASHPs is to be confirmed through developed design stage.

Heating controls will be via localised room temperature sensors controlled via the BMS.

#### **6.4 COOLING**

The cooling requirements for the building have been selected following a combination of replicating the cooling needs from previous Haskins stores and incorporating additional cooling to achieve the BREEAM HEA 04 Thermal Comfort credit.

Mechanical cooling will be provided to the following areas;

- Cash office
- Kitchen Office
- AGM Office
- GM Office
- Office
- Meeting Room
- Conference Room
- Staff Room
- Restaurant
- IT Cupboard

Cooling will be provided by means of localised DX 1-1 or multi split units. Direct Expansion (DX) air conditioning systems offer an efficient approach to providing mechanical cooling. DX air conditioning systems operate on the principle of direct heat exchange between the refrigerant and the air within a space.

Where DX systems are provided with duct mounted cooling coils, these will be controlled via localised room temperature sensors in conjunction with the BMS.

Individual room AC units will be controlled via a combination of localised room temperature sensors, and the BMS.

Note: commercial catering fridges and freezers will require external condensers (by specialist) it is anticipated these will be located adjacent to the external mechanical plantroom within a compound towards the south of the building.

#### **6.5 VENTILATION**

The building will utilise a mixture of natural and mechanical ventilation means to provide a comfortable internal environment and air quality for the occupants.

The retail space, and warehouse will utilise openable rooflights to provide fresh air ventilation to control internal air quality and temperature.

The restaurant area / servery will utilise a mechanical heat recovery ventilation unit to operate when the spaces are occupied to provide tempered fresh air to the restaurant and extract air from the servery space. The units will be capable of meeting both the heating and cooling needs of the space via integral LTHW heating & DX cooling coils. This will be controlled via a combination of CO2 sensors and room temperature sensors in conjunction with the BMS. The air handling unit will be positioned in the roof level plant area above.

Mechanical ventilation will be provided to the kitchen areas and will include the following;

- Main canopy extract fan
- Main canopy/kitchen supply air fan (inc. heating coil) Note: 80% of total extract air volume.
- Condense canopy extract fan
- Pizza oven extract fan

Kitchen ventilation system will be manually controlled.

Back of House WCs and staff areas will utilise a mechanical heat recovery ventilation unit to operate when the spaces are occupied to provide tempered fresh air to each area. Where ducted ac units are installed fresh air will terminate at the back of each fan coil unit, otherwise, fresh air will be ducted directly into each space. Heat recovery units will typically be positioned within the roof void areas above. Heat recovery units will be controlled via a combination of PIR sensors, CO2 sensors and temperature sensors in conjunction with the BMS.

All office areas, meeting rooms and conference rooms will utilise a mechanical heat recovery ventilation unit to operate when the spaces are occupied to provide tempered fresh air to each area. Where ducted ac units are installed fresh air will terminate at the back of each fan coil unit, otherwise, fresh air will be ducted directly into each space. Heat recovery units will typically be positioned within the roof void areas above. Heat recovery units will be controlled via a combination of PIR sensors, CO2 sensors and temperature sensors in conjunction with the BMS.

The warehouse wc areas will be provided with extract air ventilation via a localised inline extract fan positioned on the mezzanine area above, complete with PIR sensors to call the fan to run in each space and an overrun timer. Make-up air will be provided by door transfer grilles or door under-cuts.

The IT Comms room will be provided with extract air ventilation via a localised inline extract fan positioned on the mezzanine area above and will operate continuously. Make-up air will be provided by a door transfer grille.

The heat recovery ventilation units will recover in excess of 70% the heat from the extract air to pre-heat the incoming fresh air, each MVHR unit will be provided with an integral heating coil to ensure supply air conditions do not create draughts for occupants. Each MVHR unit will also be complete with a by-pass damper around the heat recovery coil to allow the units to provide cooling via ventilation and to operate out of hours to provide nighttime cooling to the building as required.

## **6.6 DOMESTIC COLD WATER**

A new incoming mains cold water service will be provided to serve the Garden Centre presented within the mechanical plantroom towards the south of the site complete with appropriate isolation and backflow protection to meet the local utility company requirements. The incoming water supply will serve the new heating systems filling loop, the site wide break tank and booster set, and the irrigation tank.

The building will be provided with a combined break tank and booster set to ensure adequate flow and pressure is provided to all sanitary outlets throughout the building. The break tank will be positioned externally towards the south of the building adjacent to the mechanical plantroom. The break tank will incorporate a split compartment to allow maintenance to occur without disruption to the building operation.

The site wide irrigation system will be served via an above ground storage tank and irrigation pump set positioned in the service yard, providing category 5 backflow protection. The irrigation tank will be provided with a mains water top up; top-up will only occur outside of normal operational hour to ensure the building supply is not starved.

A separate supply will be provided from the below ground rainwater harvesting tank, which during periods where rainwater is collected will be pump to the above ground irrigation tank. For further details, see below.

Separate metering will be provided to the building and irrigation systems, with further sub-metering provided to separate areas of the building.

## **6.7 DOMESTIC HOT WATER**

Domestic hot water services to the Restaurant/Servery/Kitchen end of the building will be provided via 2No. commercial electric boilers coupled with hot water storage cylinders. The hot water boilers will utilise energy from the roof mounted PV system to generate hot water. The system will utilise 2



separate hot water boilers and cylinders to allow maintenance of the hot water system without disruption to the building, but also provide resilience should a component fail.

Domestic hot water services to the WC wash hand basins and sinks towards the warehouse end of the building will be provided via a local point of use water heaters, this is to reduce the energy losses associated with long hot water circulation loops should the main plant detailed above be used to serve this end of the building. Hot water heaters will be positioned locally to the hot water outlet in which they are serving.

The wash hand basins will be provided with a thermostatic mixing valve where it does not form an integral part of the tap specification.

No provision has been made for boiling hot water taps or similar.

## **6.8 ABOVE GROUND DRAINAGE**

New above ground drainage will be provided to sanitaryware throughout the building.

Condensate wastes will be provided to all MVHR units, and fan coil units as required.

The mezzanine plant area and plant room will be provided with a floor gully to collect water from any leaks and allow a termination position for safety valves and overflows.

- kitchen above ground drainage system (including enzyme treatment system).
- Above ground drainage will be provided to all sanitaryware throughout the building, carefully coordinated with the below ground drainage.
- A rainwater harvesting system will be installed below ground to facilitate the collection of rainwater for irrigation purposes – exact location TBC.
- An appropriate location for the rainwater harvesting tank associated control panel needs to be determined following confirmation of the tank location.
- Further drainage points will be necessary for AC condensate, MVHR condensate, plantroom safety valves etc.

## **6.9 SERVICE DISTRIBUTION**

Mechanical services distribution is to be routed on common service raceways wherever possible, combined and integrated into the building structure as the majority of services are 'on-show'. Similar to that found within the new Haskins Snowhill Garden Centre. All containment will be colour coded to match the internal finish of the building structure.



## **7 ELECTRICAL SERVICES CONCEPT DESIGN**

### **7.1 INCOMING ELECTRICAL SERVICES**

The incoming electrical supply to the Garden Centre will be via a new ground mounted SSEN substation located near the entrance building. The substation will be used to supply the Garden centre site, including car park, EV chargers, service yard and other back-of-house areas.

The substation will comprise an SSEN specification Holly Green 14C39 GRP enclosure complete with double hinged doors and ventilation louvres, mounted on a concrete base. Incoming and outgoing HV and LV cabling to the substation will be routed below ground.

### **7.2 ELECTRICAL DISTRIBUTION**

A client owned main LV switchboard will be located within an external enclosure close to the new SSEN substation.

The switchboard will serve external mechanical plant, external EV chargers, external lighting and small power and the garden centre building.

MCCB panel boards will be minimum Form 3 type 2 and fitted with lockable covers.

Single and split-load MCB distribution boards will be selected as required to satisfy the sub-metering requirements. All MCB boards will be manufactured to BS EN 60439-3 and fitted with lockable doors.

All distribution equipment will be located discretely and securely in back-of-house areas and service cupboards with equipment sized to allow for 25% spare capacity.

An MCCB distribution panel will be installed within the back of house kitchen/ restaurant to provide safe and reliable primary electrical distribution across this area of the building.

The MCCB distribution panels will distribute power to MCB final circuit distribution boards and other large individual loads across the building, including but not limited to PV system, sales, kitchen, servery, offices, warehouse, external sales mechanical services and external lighting MCB distribution boards.

Internal busbar distribution will be provided at high level within the garden centre.

### **7.3 LIGHTNING PROTECTION**

A lightning protection system will be provided to the garden centre building, designed to prevent damage to the building and injury to occupants as a result of a lightning strike.

The design of each system will be subject to a risk assessment carried out by a specialist in compliance with BS EN 62305 & BS 7430.

The building construction may utilize the available steel work or may necessitate the use of separate earth tapes and arrays fixed to the free surface of the building fabric. These will be concealed behind rainwater down pipes or other discrete locations in order not to compromise the aesthetics of the facades.

### **7.4 SURGE PROTECTION**

A combined lightning and surge arrestor device will be provided either within or adjacent to each electrical distribution panel and distribution board.

The new inverters provided as part of the PV arrays will be provided with integral surge protection devices.

### **7.5 EARTHING & BONDING**

Earthing and bonding systems will be provided to meet all statutory and regulatory requirements. All extraneous metalwork will be earthed including but not limited to the following:

- Incoming Services
- Building Structure
- Lightning protection System
- Mechanical Services
- Enclosures and IT Equipment

## **7.6 ENERGY METERING**

Comprehensive energy monitoring will be provided across the installation in compliance with BREEAM requirements.

The meters will be integrated into the building BMS system to provide energy monitoring and management.

## **7.7 PHOTOVOLTAIC**

A photovoltaic array will be installed on the roof of the Garden Centre.

The photovoltaic inverters will be located discretely within a back-of-house area of each building.

The photovoltaic installation will provide primary benefit to the building user, reducing the electrical demand of the building from the local electricity network. Any surplus energy will be exported to the local energy network.

The Photovoltaic installation will include monitoring functionality to provide the client granular import, generation and export consumption data.

## **7.8 CABLING**

Primary Electrical Distribution will comprise multi-core armoured cables to BS 6724, with full sized neutrals.

Final circuits for small power services and lighting will generally be via twin and earth LSZH sheathed & insulated cable 624\*B or LSZH multicore flex 318\*B cable.

## **7.9 CONTAINMENT**

The cable management will be segregated to provide individual containment for final distribution cables, sub-mains cabling, fire alarm, ELV systems (i.e. security, BMS) and data systems.

The main containment routes within building will generally be concealed above a suspended ceilings where possible. Within areas where no ceiling voids are available the containment systems, routes and finishes will be carefully considered to align with the architectural and interior design requirements of the space.

Appropriate additional containment capacity will be provided across the building to all for future site requirements.

Suitable ceiling access hatches will be provided as required to ensure ongoing access to containment routes for installation, maintenance, and service alterations.

Where appropriate and in areas with high numbers of socket outlets (for example office areas), surface mounted multi-compartment dado trunking will be installed.

## **7.10 SMALL POWER SUPPLIES**

Supplies will be provided to:

- Mechanical services equipment.
- EV Chargers.
- Kitchen and server equipment.
- Irrigation systems.
- General small power outlets.
- Fire alarm system.
- Security alarm system.
- Disabled WC Alarm system.
- PA system.
- Door access controls.
- Motorised doors.
- Data racks & UPS equipment
- Hand driers / Auto flushes / Sensor Taps.
- Doorbell / intercom / access barrier.



- EAS Pedestals.
- AV Equipment.
- CCTV Equipment.

#### **7.11 MOTORISED DOORS**

Motorised sliding doors will be provided at the following locations:

- Public entry / exit doors between the car park and garden centre retail areas.
- Public entry / exit doors between the internal and external retail areas.
- Public entry / exit doors between the internal and external restaurant areas.

The retail area doors will each be provided with closed, open and automatic key-switch controls. The automatic function will comprise overdoor proximity sensors.

The restaurant area door will be provided with closed, open and automatic pushpad-only controls. The automatic function will comprise accessible push-pad controls to allow the user to open the door as necessary whilst preventing unintended operation by persons seated in close proximity to the doors.

A motorised roller shutter door will be provided between the retail areas and warehouse area. The door will be PIR and access control controlled.

A motorised roller / section door will be provided between the warehouse area and service yard. The door will be operated via manual controls within the warehouse.

#### **7.12 DOOR ACCESS CONTROL**

Access control will be provided to the following areas to prevent unauthorised entry by the public:

- Staff external access door.
- Motorised roller door between warehouse and retail area.

Door controllers for the access-controlled doors will be located discretely typically within services cupboards and other non-customer facing areas.

All doors with access control installed will fail safe during a fire alarm activation, this will be achieved by connection to the fire alarm system in the building through an interface unit.

#### **7.13 TELECOMMUNICATIONS**

Telephony services will be provided to the buildings via a series of below ground ducts and pits. The Openreach duct infrastructure will rise within a secure area of the building.

Below ground client communication ducts will be installed across the site, complete with suitable draw pits. The client duct infrastructure will rise within a secure area of the buildings allowing connection of the clients private IT network between various buildings and areas of the site.

The provision of the incoming telephony services from external providers will be by the client.

#### **7.14 STRUCTURED CABLING**

Cross site private fibre links will be provided between buildings and areas of the site.

A structured cabling installation will be provided throughout each of the buildings.

The structured cabling system will comprise CAT6A cabling run in dedicated discrete data cabling containment with suitable separation from other services.

It is anticipated that IT racks or cabinets will be installed in a secure area of each building. The IT system specification will be by the Haskins IT specialist.

The requirements for interactive displays, displays, TV's, wireless access points and other hardware across each site will be finalised with the client.

The specification and supply of IT hardware computers and TV's will be by the client.

Uninterruptable Power Supplies (UPS) will be provided as required to support the IT infrastructure, the equipment will be located within the IT equipment spaces, typically within the equipment rack or cabinet.

#### **7.15 CCTV**

A new CCTV system will be provided to the building, including internal and external areas.



The CCTV system will be provided via the data network in accordance with the requirements that fully complies with BS 7958:2015 '*Closed circuit television (CCTV). Management and operation. Code of practice*'

Digital recording equipment will be installed in a central secure location.

#### **7.16 INTRUDER ALARM SYSTEM**

A comprehensive intruder alarm system will be provided to the building.

New intruder detection and alarm system will be provided in accordance with the specific security grade &, environmental class that satisfies the requirements of the client and building insurer.

The system will comprise window / door contacts, vibration sensors, PIRs, internal and external sounders.

Panic alarms will be installed at various locations across the site, typically at point-of-sale positions.

External beam detectors will be installed to provided perimeter protection to external sales areas.

The security alarm system will be interfaced to the building management system, thus allowing last-person-out profile to enabled across the building services systems.

#### **7.17 EAS (ELECTRONIC ARTICLE SURVEILLANCE)**

An EAC pedestal system will be installed at the following areas. The system is designed to detect security tags on items of high value equipment and thus to prevent the removal of unpaid items from the store.

- Main entrance internal door.
- Main exit internal door.
- Entrance to public toilet corridor.

#### **7.18 WORKFORCE MANAGEMENT SYSTEM**

A biometric workforce management system will be installed to facilitate employee sign-in/sign-out, as undertaken at other Haskins stores.

The system will be installed close to the staff entrance to the building.

#### **7.19 DOORBELL / INTERCOM / ACCESS BARRIER**

A doorbell will be installed adjacent to the at the kitchen delivery door entrance complete with internal bell in the back-of-house kitchen area.

An audio intercom will be installed adjacent to the service yard delivery entrance, the intercom will be interfaced to a receiver located within the goods-in desk within the warehouse.

A motorised access barrier will be installed at the entrance to the service yard. The barrier will comprise a control switch at the good-in desk within the warehouse and a ground loop to automatically raise the barrier upon vehicle approach from the service yard side of the barrier. The barrier will be located within the threshold of the service yard, thus allowing secure manual gates to be closed outside of operating hours.

#### **7.20 PUBLIC ADDRESS SYSTEM**

A new public address system will be provided and installed throughout the new garden centre development for suitable for voice (tannoy) announcements and music playback, compliant with BS 6259:2015.

The system will include a central undercounter rack located at the retail area Public Information desk.

The system will be interfaced to the fire alarm system to inhibit music playback upon activation of the fire alarm. The fire alarm system will not be used as a voice alarm systems.

#### **7.21 INTERNAL LIGHTING**

Internal lighting will be LED low energy type throughout, compliant with CIBSE SLL Guides.

Lighting control methodology and zoning within buildings will be compliant with BREEAM requirements.



All lighting switches / accessories will typically be white / coloured plastic, with metal finish within plant room areas etc. IP 65 rated switches will be provided in wet and hazardous areas.

The lighting within the toilet and back-of-house areas will comprise automatic PIR controls.

The lighting within the front-of-house areas and M&E plant rooms will typically comprise manual controls.

The light fittings will be selected to achieve lighting to minimise contrast and achieve a good average level of illuminance. Particular attention will be paid to ensuring that walls and ceilings are illuminated to enhance the building appearance.

#### **7.22 EMERGENCY LIGHTING**

All emergency lighting will generally be LED type complete with 3-hour duration in compliance with BS 5266 and Building Regulations.

Additional safety emergency lighting will be installed in high-risk plant areas.

Exit signs will be illuminated by local emergency lighting.

A key switch testing facility will be provided that will require enhanced input from the building user in order to maintain the building emergency lighting system in compliance with BS 5266.

#### **7.23 EXTERNAL LIGHTING**

Internal lighting will be LED low energy type throughout, compliant with CIBSE SLL Guides.

Lighting control and zoning will be compliant with BREEAM requirements.

For further details refer to the external lighting strategy document.

#### **7.24 FIRE DETECTION CONTROL & SUPPRESSION SYSTEMS**

A fire alarm system will be installed in compliance with the requirements of the fire engineer and building insurer.

The fire alarm panel will be located adjacent to the main entrance door.

A firefighting gateway system will be installed and connected into the new photovoltaic array installed upon the roof of the building, this will ensure that during a fire alarm activation the inverters will shut down the systems to a 'touch safe' voltage.

Kitchen fire suppression and fire smoke shutters will be provided as required by the fire engineer and building insurer.

Door hold open devices will be provided as required by the fire engineer to provide compartmentation as required by the fire engineer and building insurer.

Visual fire alarm warning indicators are to be provided to alert occupants with sensory disabilities of an alarm situation.

Input/output Interface modules will be provided to signal third party equipment upon alarm activation.

Automatic smoke detectors, heat detectors, and manual break glass call points will be located throughout the building to detect a fire condition. Break Glass Units will be provided with plastic drop down covers.

#### **7.25 ACCESSIBLE WASHROOM ALARMS**

A new localised disabled WC alarm will be provided to a public and staff accessible washrooms.

The overdoor buzzer and warning lamp will be provided above each washroom door.

All alarms will be relayed to a central annunciation panel located at the public information desk within the retail area of the building.

#### **7.26 ELECTRIC CAR CHARGING**

EV chargers will be installed within the Garden Centre public car park in compliance with Building Regulations Part S, local planning and client requirements.

EV chargers will be supplied from a nearby electrical feeder pillar.

The EV charging system will be cloud connected to allow management of the use chargers and to facilitate load management of the installation.



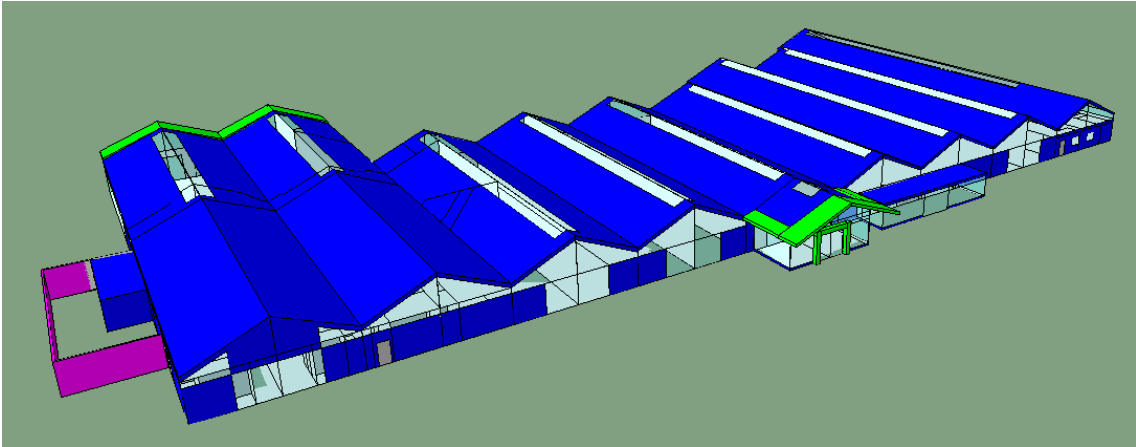
**8 APPENDIX A: PHOTOVOLTAIC ASSESSMENT MODEL**

**8.1 GARDEN CENTRE IMAGES**



**9 APPENDIX B: RIBA STAGE 2 SBEM MODEL**

**9.1 GARDEN CENTRE IMAGE**



10 **APPENDIX C: RIBA STAGE 2 BRUKL REPORT**  
10.1 **GARDEN CENTRE BRUKL REPORT**

# BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

<b>Project name</b>	
<b>Haskins Forest Lodge Garden Centre</b>	As designed
Date: Thu Jan 04 20:59:14 2024	

### Administrative information

<p><b>Building Details</b></p> <p>Address: Haskins Forest Lodge Garden Centre, Farnham, GU10 4LD</p> <p><b>Certifier details</b></p> <p>Name: Neil Bajaj Telephone number: Phone Address: Street Address, City, Postcode</p>	<p><b>Certification tool</b></p> <p>Calculation engine: Apache Calculation engine version: 7.0.24 Interface to calculation engine: IES Virtual Environment Interface to calculation engine version: 7.0.24 BRUKL compliance module version: v6.1.e.1</p>
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Foundation area [m<sup>2</sup>]: 6238.64

### The 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	5.85
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> :annum	1.3
Target primary energy rate (TPER), kWh <sub>ep</sub> /m <sup>2</sup> :annum	62.51
Building primary energy rate (BPER), kWh <sub>ep</sub> /m <sup>2</sup> :annum	10.19
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>b-Limit</sub>	U <sub>b-Calc</sub>	U <sub>i-Calc</sub>	First surface with maximum value
Walls*	0.26	0.15	0.15	1_000015:Surf[3]
Floors	0.18	0.12	0.12	1_000015:Surf[0]
Pitched roofs	0.16	0.12	0.12	1_00000C:Surf[2]
Flat roofs	0.18	0.12	0.12	1_000015:Surf[1]
Windows** and roof windows	1.6	1.2	1.2	1_000015:Surf[2]
Rooflights***	2.2	1.3	1.3	1_00001E:Surf[1]
Personnel doors <sup>^</sup>	1.6	1.3	1.3	CN00000B:Surf[3]
Vehicle access & similar large doors	1.3	1.3	1.3	FF000003:Surf[0]
High usage entrance doors	3	-	-	No high usage entrance doors in building

U<sub>b-Limit</sub> = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]  
 U<sub>b-Calc</sub> = Calculated 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)]  
 \* 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	5

**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	<0.9

**1- UFH System + NV**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3.2	-	0.2	-	-
<b>Standard value</b>	2.5*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

**2- DX + MVHR**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	4	5	0	-	0.7
<b>Standard value</b>	2.5*	5	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

**3- Restaurant Supply/Extract**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3.2	-	0.2	1.9	0.7
<b>Standard value</b>	2.5*	N/A	N/A	1.9^	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

**4- UFH System + Mech Vent**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3.2	-	0.2	-	0.7
<b>Standard value</b>	2.5*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

**5- UFH System + Ext**

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3.2	-	0.2	-	-
<b>Standard value</b>	2.5*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

**1- DHW 10L POU**

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	1	0.041
<b>Standard value</b>	1	N/A

2- DHW Restaurant

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	1	0.004
<b>Standard value</b>	1	N/A

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	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
<b>Standard value</b>	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
CASH OFFICE (WAREHOUSE)	-	-	-	1.5	-	-	-	-	-	-	N/A	
CONFERENCE ROOM	-	-	-	1.5	-	-	-	-	-	-	N/A	
STAFF ROOM	-	-	-	1.5	-	-	-	-	-	-	N/A	
STAFFROOM SHOWERROOM	-	-	-	1.9	-	-	-	-	-	-	N/A	
STAFFROOM WC	-	-	-	1.9	-	-	-	-	-	-	N/A	
STAFFROOM WC	-	-	-	1.9	-	-	-	-	-	-	N/A	
CHANGING PLACES	-	-	-	1.9	-	-	-	-	-	-	N/A	
KITCHEN	-	-	1	-	-	-	-	-	1	-	N/A	
DDA WC	-	-	-	1.9	-	-	-	-	-	-	N/A	
FEMALE WASHROOM	-	-	-	1.9	-	-	-	-	-	-	N/A	
MALE WASHROOM	-	-	-	1.9	-	-	-	-	-	-	N/A	
OFFICE (KITCHEN)	-	-	-	1.5	-	-	-	-	-	-	N/A	
WC (WAREHOUSE)	-	-	0.5	-	-	-	-	-	-	-	N/A	
MEETING ROOM (WAREHOUSE)	-	-	-	1.5	-	-	-	-	-	-	N/A	
ACC WC (WAREHOUSE)	-	-	0.5	-	-	-	-	-	-	-	N/A	
AGM OFFICE (WAREHOUSE)	-	-	-	1.5	-	-	-	-	-	-	N/A	
GM OFFICE (WAREHOUSE)	-	-	-	1.5	-	-	-	-	-	-	N/A	

Zone name	General lighting and display lighting	General luminaire	Display light source	
		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
<b>Standard value</b>		95	80	0.3
SALES AREA EXIT		120	-	-
PLANT		120	-	-
ENTRANCE LOBBY (WAREHOUSE)		120	-	-
CASH OFFICE (WAREHOUSE)		120	-	-
LOBBY (WAREHOUSE)		120	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
	<b>Standard value</b>	95	80	0.3
MEZZANINE PLANT		120	-	-
MEZZANINE PLANT		120	-	-
RESTAURANT		120	120	1.25
CONFERENCE ROOM		120	-	-
FIRE EXIT		120	-	-
STAFF ROOM		120	-	-
STAIRS TO ROOF		120	-	-
DRY STORE 1		120	-	-
STAFFROOM SHOWERROOM		120	-	-
STAFFROOM WC		120	-	-
STAFFROOM WC		120	-	-
DRY STORE 2		120	-	-
FIRE EXIT		120	-	-
CIRCULATION		120	-	-
CHANGING PLACES		120	-	-
KITCHEN		120	-	-
DDA WC		120	-	-
FEMALE WASHROOM		120	-	-
MALE WASHROOM		120	-	-
CLEANERS CUPBOARD		120	-	-
COLD ROOM		120	-	-
LAUNDRY		120	-	-
COSH		120	-	-
CIRCULATION		120	-	-
COLD ROOM		120	-	-
STORE (KITCHEN)		120	-	-
OFFICE (KITCHEN)		120	-	-
FREEZER		120	-	-
WC (WAREHOUSE)		120	-	-
MEETING ROOM (WAREHOUSE)		120	-	-
ACC WC (WAREHOUSE)		120	-	-
MAIN ENTRANCE LOBBY		120	-	-
RETAIL		120	120	1.25
OFFICE (WAREHOUSE)		120	-	-
AGM OFFICE (WAREHOUSE)		120	-	-
CUPBOARD (WAREHOUSE)		120	-	-
GM OFFICE (WAREHOUSE)		120	-	-
IT CUPD		120	-	-
WAREHOUSE		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?
CASH OFFICE (WAREHOUSE)	N/A	N/A
RESTAURANT	YES (+413.3%)	NO
CONFERENCE ROOM	YES (+58.8%)	NO
STAFF ROOM	YES (+76.7%)	NO
OFFICE (KITCHEN)	NO (-74.3%)	NO
MEETING ROOM (WAREHOUSE)	N/A	N/A
RETAIL	YES (+150.2%)	NO
OFFICE (WAREHOUSE)	NO (-70%)	NO
AGM OFFICE (WAREHOUSE)	N/A	N/A
GM OFFICE (WAREHOUSE)	N/A	N/A

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

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

## Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m <sup>2</sup> ]	6097.9	6097.9	100	<b>Retail/Financial and Professional Services</b>
External area [m <sup>2</sup> ]	13212.1	13212.1		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	4		General Industrial and Special Industrial Groups
Average conductance [W/K]	3614.82	3498.39		Storage or Distribution
Average U-value [W/m <sup>2</sup> K]	0.27	0.26		Hotels
Alpha value* [%]	25	10		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
				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

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

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

	Actual	Notional
Heating	7.6	10.15
Cooling	0.89	0.33
Auxiliary	7.04	3.71
Lighting	8.24	7.61
Hot water	22.42	20.12
Equipment*	44.75	44.75
<b>TOTAL**</b>	<b>46.19</b>	<b>41.91</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	40.94	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	40.94	0

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

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	90.34	106.99
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	10.19	62.51
Total emissions [kg/m <sup>2</sup> ]	1.3	5.85



<b>HVAC Systems Performance</b>									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	107.8	0	10.5	0	2.1	2.86	0	3.2	0
Notional	143	0	14.3	0	1.2	2.78	0	---	---
<b>[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	59.8	0	5.8	0	12	2.86	0	3.2	0
Notional	36.8	0	3.7	0	12.5	2.78	0	---	---
<b>[ST] Central heating using water: floor heating, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	16	0	1.6	0	11.2	2.86	0	3.2	0
Notional	16.8	0	1.7	0	5.6	2.78	0	---	---
<b>[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	96.6	395.4	7.2	30.9	4.9	3.73	3.55	4	5
Notional	83.5	190	8.3	11.4	2.8	2.78	4.63	---	---
<b>[ST] Central heating using air distribution, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	12.9	0	1.2	0	25.8	3.01	0	3.2	0
Notional	8	0	0.8	0	14.1	2.78	0	---	---
<b>[ST] No Heating or Cooling</b>									
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

11 **APPENDIX D: RIBA STAGE 2 EPC**  
11.1 **GARDEN CENTRE EPC**

**Energy Performance Certificate** HM Government  
Non-Domestic Building

Haskins Forest Lodge Garden Centre  
Holt Pound  
Farnham  
GU10 4LD

**Certificate Reference Number:**  
2141-8642-6044-5933-5987

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at [www.gov.uk/government/collections/energy-performance-certificates](http://www.gov.uk/government/collections/energy-performance-certificates).

**Energy Performance Asset Rating**

More energy efficient

**A+**

**A** 0-25

**B** 26-50

**C** 51-75

**D** 76-100

**E** 101-125

**F** 126-150

**G** over 150

Less energy efficient

Net zero CO<sub>2</sub> emissions

**3**

This is how energy efficient the building is.

**Technical information**

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Natural Ventilation
Total useful floor area (m <sup>2</sup> ):	6097.886
Building complexity:	Level 5
Building emission rate (kgCO <sub>2</sub> /m <sup>2</sup> per year):	1.3
Primary energy use (kWh <sub>w</sub> /m <sup>2</sup> per year):	10.19

**Benchmarks**

Buildings similar to this one could have ratings as follows:

**12** If newly built

**48** If typical of the existing stock

## Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

**Assessment Software:** Virtual Environment v7.0.24 using calculation engine ApacheSim v7.0.24

**Property Reference:** UPRN-000000000000

**Assessor Name:** Neil Bajaj

**Assessor Number:** EES/027663

**Accreditation Scheme:** Elmhurst Energy Systems

**Assessor Qualifications:** NOS5

**Employer/Trading Name:** Trading Name

**Employer/Trading Address:** Trading Address

**Issue Date:** 05 Jan 2024

**Valid Until:** 04 Jan 2034 (unless superseded by a later certificate)

**Related Party Disclosure:** Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 0875-1555-4772-5470-9316

## About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Elmhurst Energy Systems. You can obtain contact details of the Accreditation Scheme at [www.elmhurstenergy.co.uk](http://www.elmhurstenergy.co.uk).

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at [www.ndepcregister.com](http://www.ndepcregister.com). The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at [www.opendatacommunities.org](http://www.opendatacommunities.org).

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit [www.ndepcregister.com](http://www.ndepcregister.com). To opt out of having information about your building made publicly available, please visit [www.ndepcregister.com/optout](http://www.ndepcregister.com/optout).

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: [www.gov.uk/government/collections/energy-performance-certificates](http://www.gov.uk/government/collections/energy-performance-certificates). It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

## Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.



12 **APPENDIX F: RIBA PROJECT RESPONSIBILITY MATRIX**

RIBA stage and title	Summary of main deliverables for the Building Services Designer	Responsibility
Project Initiation		
1 Preparation & Brief	<ul style="list-style-type: none"><li>Appraisal of physical site data, assess any key planning and environmental issues for the site.</li><li>Gather key Client data and any special requirements</li></ul>	Consulting Engineer
2 Concept Design	<ul style="list-style-type: none"><li>Draw up strategic proposals for M&amp;E services</li><li>Consider site services infrastructure</li><li>Undertake essential M&amp;E spatial planning</li><li>Agree project procurement strategy</li><li>Confirm project design brief / M&amp;E budget cost</li></ul>	Consulting Engineer
3 Developed Design	<ul style="list-style-type: none"><li>Develop concept design proposals</li><li>Arrange / liaise with Statutory Service suppliers</li><li>High level co-ordination of services with building &amp; structure</li><li>Prepare Employers Requirements documents / sketch drawings for tender</li><li>Assist QS with pre-tender estimate</li></ul>	Consulting Engineer
Tender		
4 Technical Design	<ul style="list-style-type: none"><li>Confirm spatial requirements for all services.</li><li>Confirm sizes of ducts, pipework, flues, cables and electrical containment etc.</li><li>Prepare schematics and technical design drawings.</li><li>Carry out all necessary design calculations</li><li>Select plant and equipment</li><li>Freeze technical design and issue fixed general arrangement drawings.</li></ul>	Contractor
5 Construction	<ul style="list-style-type: none"><li>Prepare builders' work information and co-ordinated working drawings.</li><li>Review, collate and integrate information from sub-contractors and specialists</li><li>Allow for liaison with specialist contactors and supplies and co-ordinate their services with M&amp;E systems</li></ul>	Contractor
6	<ul style="list-style-type: none"><li>Record any changes to design information</li><li>Prepare building manuals including drawings, test results, certificates, health and safety file.</li></ul>	Contractor



Handover and Close Out	<ul style="list-style-type: none"><li>▪ Contribute to energy log book and end user guide etc.</li><li>▪ Prepare pre-handover defects schedule.</li><li>▪ Prepare As Built BRUKL / SBEM documents &amp; submit to Building Control</li><li>▪ Prepare &amp; Issue EPC</li></ul>	
	<ul style="list-style-type: none"><li>▪ Demonstrate services installations to Consulting Engineer, allow for Engineer to witness testing &amp; commissioning</li></ul>	Consulting Engineer Contractor
7 In Use	<ul style="list-style-type: none"><li>▪ Review and clear list of defects from post-completion audit.</li><li>▪ Train facility management team and building users on the installed systems.</li><li>▪ Undertake seasonal commissioning</li></ul>	Contractor
Project Completion		