

Sustainability Strategy Review

Site Name:	Kneller Hall
Planning reference number:	22/3004/ FUL
Case officer:	[REDACTED]
Consultant:	[REDACTED]
Comments provided on:	16/03/2023

Details:

The demolition of existing modern buildings on the site and the conversion of and extensions to Kneller Hall and other ancillary buildings associated with the former royal military music school to a day school (Use Class F1), together with the construction of associated new purpose-built buildings including teaching space, indoor sports facilities, sporting pavilion and forest school building. Alterations to the existing playing fields, to include an all weather pitch with fencing and flood lighting to existing tennis courts. Provision of a new access from Whitton Dene, and other ancillary works including parking areas, hard and soft landscaping, lighting, access alterations and energy centre. Internal and external alterations to Kneller Hall and the curtilage listed buildings to facilitate the day school use, including demolition and rebuilding of single storey extension to the west wing of Kneller Hall, extension to the Band Practice Hall and re-opening of Whitton Dene site entrance.

Recommended actions for planner: (conditions)

- Provide a copy of the completed TM54 assessments evaluating operational unregulated energy demand.
- Provide copies of the TM52 overheating assessment for the sports pavilion and the Sports Hall.
- The BREEAM 'Refurbishment and Fit out' AND 'New Construction 2018' final certifications will be required before occupation of the last phased building for each assessment.

Documents considered:

Sustainability Strategy Review Applicant Response- by SRE - February 2023

GLA Be Seen Spreadsheet v2.1-by SRE- August 2022

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General requirements

As a major **Non-residential** development, the following is required:

- Achieve zero carbon standards in line with the London Plan.
- Achieve an energy efficiency value at least 15% greater than Part L through energy efficient measures.
- 35% reduction in in CO2 emissions over Building Regulations Part L (2021) achieved on-site with the remaining emissions (up to 100%) to be offset through a contribution into the Council's Carbon Offset Fund.
- Achieve BREEAM Excellent rating.

Key points presented

New buildings (Sports Hall, Teaching Block, Sports Pavilion and School Hall extension)

- 4% CO2 reduction compared to the Building Regulations Part L 2021 for the 'Be Lean' scenario which is below the 15% threshold required.
- 0% for the 'Be Clean' scenario
- 68.3% for the 'Be Green' scenario
- 78% total reduction.
- Achieves BREEAM 'Excellent' rating using the BREEAM New Construction 2018 scheme.
- This results in a carbon offset payment of £25,008 (8.8 tonnes CO2)

Refurbished existing buildings (Kneller Hall, School Hall and Guard House)

- 6% CO2 reduction compared to the Building Regulations Part L 2021 for the 'Be Lean' scenario but does not comply with the Building Regulations Part L 2021
- 0% for the 'Be Clean' scenario
- 12% for the 'Be Green' scenario
- 18% total reduction
- Achieves BREEAM 'Very Good' rating using the BREEAM Refurbishment and Fitout 2014 scheme.
- This results in a carbon offset payment of £96,373 (33.8 tonnes CO2)

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The London Borough of Richmond-upon-Thames

Adopted Local Plan 2018- Policy LP 22 Sustainable Design and Construction

A. Developments will be required to achieve the highest standards of sustainable design and construction to mitigate the likely effects of climate change. Applicants will be required to complete the following:

1. Development of 1 dwelling unit or more, or 100sqm or more of non-residential floor space (including extensions) will be required to complete the Sustainable Construction Checklist SPD.
2. Development that results in a new residential dwelling, including conversions, change of use, and extensions that result in a new dwelling unit, will be required to incorporate water conservation measures to achieve maximum water consumption of 110 litres per person per day for homes (including an allowance of 5 litres or less per person per day for external water consumption).
3. New non-residential buildings over 100sqm will be required to meet BREEAM 'Excellent' standard.
4. Proposals for change of use to residential will be required to meet BREEAM Domestic Refurbishment 'Excellent' standard (where feasible).

Comment:

A copy of the completed Sustainable Construction Checklist SPD has been provided in Appendix E of the Energy and Sustainability report confirming a score of 71.5% (A+) has been achieved for the New Buildings

Two BREEAM pre-assessments have been provided, Refurbishment and Fitout for the existing building (School Hall, Kneller Hall and Guard House) achieving 'Very Good' rating and BREEAM New Construction 2018 for (Sports Hall, Teaching block, Sports Pavilion and the School Hall extension) achieving 'Excellent' rating.

Due to the refurbished buildings been listed with existing elements been retained, it would be difficult to achieve an 'Excellent rating'. The minimum standards for 'an 'Excellent rating have been met and the overall very high Very Good score of 65% has been reflected. This justification has been accepted.

Action:

None

Reducing Carbon Dioxide Emissions

B. Developers are required to incorporate measures to improve energy conservation and efficiency as well as contributions to renewable and low carbon energy generation. Proposed developments are required to meet the following minimum reductions in carbon dioxide emissions:

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1. All new major residential developments (10 units or more) should achieve zero carbon standards in line with London Plan policy.
2. All other new residential buildings should achieve a 35% reduction.
3. All non-residential buildings over 100sqm should achieve a 35% reduction. From 2019 all major non-residential buildings should achieve zero carbon standards in line with London Plan policy. Targets are expressed as a percentage improvement over the target emission rate (TER) based on Part L of the 2013 Building Regulations.

C. This should be achieved by following the Energy Hierarchy:

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

D. The Council requires developments to contribute towards the Mayor of London target of 25% of heat and power to be generated through localised decentralised energy (DE) systems by 2025. The following will be required:

1. All new development will be required to connect to existing DE networks where feasible. This also applies where a DE network is planned and expected to be operational within 5 years of the development being completed.
2. Development proposals of 50 units or more, or new non-residential development of 1000sqm or more, will need to provide an assessment of the provision of on-site decentralised energy (DE) networks and combined heat and power (CHP).
3. Where feasible, new development of 50 units or more, or new non-residential development of 1000sqm or more, as well as schemes for the Proposal Sites identified in this Plan, will need to provide on-site DE and CHP; this is particularly necessary within the clusters identified for DE opportunities in the borough-wide Heat Mapping Study. Where on-site provision is not feasible, provision should be made for future connection to a local DE network should one become available.

Applicants are required to consider the installation of low, or preferably ultra-low, NOx boilers to reduce the amount of NOx emitted in the borough.

Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged where appropriate

Comment:

Whole Life carbon assessment confirms (page 14) the embodied carbon emissions over the lifetime of the new buildings is 10006.4 kgCO₂e/m².

The Energy and Sustainability Statement (section 3) demonstrates addressing the Energy Hierarchy for the Be Lean, Be Clean and Be Green scenarios.

Be Lean

The proposed u-values are of an excellent standard for the New buildings' elements. The Refurbished listed buildings u-values stays the same.

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The Be Lean measures have been addressed including location, building form, glazing specification, shading, LED lightings.

For the New buildings, the CO2 reduction achieved through the passive design measures is 4% which is below the 15% required due to using the new Part L 2021 with difficult perimeters.

For the Refurbished buildings the CO2 reduction has been confirmed as 6%.

The New building achieves 4% for the Be Lean option using the new building regs Part L 2021. The BRUKL shows failure to the Refurbished buildings.

Be Clean

The Energy and Sustainability Statement confirms (section 3.4) that the development is not located within an area with an existing or proposed district heating system.

The communal heat pump system has been proposed to meet the heating and hot water demand. This system will be designed to have centralised boiler plant which will allow connection to a district heating scheme in the future.

The CHP plant has been addressed but it has been proven that it is not suitable for the development (intermittent usage periods, noise consideration, cost)

Be Green

The GLA carbon sheets confirm that the new development achieves 74% and the Refurbished buildings achieves 12% improvement over Part L 2021 for the 'Be Green' scenario.

In section 3.5 the Energy and Sustainability Statement confirms that the 'Be Green' option has been fully addressed stating that a combination of Air Source Heat Pumps (ASHPs) and PV panels have been proposed for the development.

The applicant's repose sheet states that future connection would be made within the energy centre to integrate a suitable heat exchanger between the Kneller Hall district heating circuit and the wider district heating system. WB Shiels have prepared three drawings showing the possible connection from the energy centre to the main road, which has been submitted at Appendix A.

Action:

None

London Local Plan (March 2021)

Requirement: SI 2 Minimising greenhouse gas emissions

Requirement: SI 2 A

Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

- 1) be lean: use less energy and manage demand during operation.

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- 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
- 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
- 4) be seen: monitor, verify and report on energy performance.

Comment:

The Energy and Sustainability Statement demonstrates compliance with the first three steps of the hierarchy, actions have been taken at each step. Be Green 'Connection to an existing network' option has been excluded due to not having existing networks.

Communal centralised pump system has been proposed to meet the development heating and cooling demands.

The Energy and Sustainability Statement confirms (section 3.5) addresses the 'Be Seen' scenario including the three stages of reporting the energy performance data. It also confirms that the development will be supplied by Smart Meters and Building Energy management system (BEMS) with internal energy displays to allow the observation on the energy use during the development occupation.

Copy of the 'Be Seen' spread sheets have been provided.

Action:

None

Requirement: SI 2 B

Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

Comment:

Detailed energy assessment has been provided with clear energy hierarchy and calculations have been made to meet the net zero with the £95/t offset.

The Energy and Sustainability Statement confirms in section 3.6 that a payment of £25,008 (8.8 tonnes CO₂) will be provided covering the New Buildings.

The GLA carbon sheets confirm a payment of £96,373 (33.8 tonnes CO₂) is needed for the Refurbished buildings.

The applicant's repose sheet states that the School Hall is a very small extension of only 129 m² and is an area where people be located for only short periods of time.

Th Sports pavilion (305m²) has glazed openings are primarily on the eats elevation. The club room space will be used during matches and has large opening doors.

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The Sports Hall will be delivered as part of the final phase of the project and a full overheating assessment has not been undertaken currently.

Action:

None

Requirement: SI 2 C

A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures.

Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:

- 1) through a cash in lieu contribution to the borough's carbon offset fund, or
- 2) off-site provided that an alternative proposal is identified, and delivery is certain

Comment:

The Energy and Sustainability Statement addresses the energy efficient design features including passive and active measures with enough details including excellent U-values and air permeability for the New buildings.

The Refurbished listed buildings u-values stays the same.

For the New buildings, the CO2 reduction achieved through the passive design measures is 4% which is below the 15% required due to using the new Part L 2021 with difficult perimeters.

For the Refurbished buildings the CO2 reduction has been confirmed as 6%.

Offsetting requirement is correctly calculated as £25,008 for the New Buildings and £96,373 for the refurbished buildings.

Action:

None

Requirement: SI 2E

Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.

Comment:

The BRUKL documents for the New and Refurbished buildings include information about the unregulated loads (equipment) but minimising the CO2 emissions from them has not been addressed.

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The applicant's repose sheet confirms that Ene08- energy equipment credits have been targeted on the BREEAM which aims to encourage using energy efficient equipment. Furthermore, SRE will complete TM54 assessments at an appropriate stage.

Action:

None

Requirement: SI 2F

Development proposals referable (150+ homes, 300m+ high, Greenbelt or open land) to the Mayor should calculate whole lifecycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions."

Comment:

I'm not aware of this being referable.

Action:

None

Policy SI 3 – Energy Infrastructure

- A. Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
- B. Energy masterplans should be developed for large-scale development locations (such as those outlines in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify;
 - 1) major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
 - 2) heat loads from existing buildings that can be connected to future phases of a heat network
 - 3) major heat supply plant including opportunities to utilise heat from energy from waste plants
 - 4) secondary heat sources, including both environmental and waste heat
 - 5) opportunities for low and ambient temperature heat networks
 - 6) possible land for energy centres and/or energy storage
 - 7) possible heating and cooling network routes
 - 8) opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
 - 9) infrastructure and land requirements for electricity and gas supplies

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- C. Development Plans should:
- 1) identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
 - 2) identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and interconnecting existing networks as well as establishing new networks.
- D. Major development proposals within Heat Network Priority Areas should have a communal low temperature heating system
- 1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
 - a. connect to local existing or planned heat networks
 - b. use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
 - c. use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)
 - d. use ultra-low NOx gas boilers.
 - 2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements of policy SI1 Part B
 - 3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.
- E. Heat networks should achieve good practice design and specification standards for primary, secondary, and tertiary systems comparable to those set out in the CIBSE CP1 Heat Networks: Code of Practice for the UK or equivalent.

Comment:

The implementation of community or district-based heating system has been considered for the site.

The Energy and Sustainability Statement confirms (section 3.4.1) that the development is located within Heat Network Priority Area.

The Energy and Sustainability Statement further confirms (section 3.4) that the development is not located within an area with an existing or proposed district heating system.

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The CHP plant has been addressed but it has been proven that it is not suitable for the development (intermittent usage periods, noise consideration, cost)

The communal heat pump system has been proposed to meet the heating and hot water demand with a centralised boiler plant allowing future connection to a district heating scheme.

The applicant's response provide drawings and details about how the communal centralised system will be connected to a network district heating scheme if it became available.

Action:

None

Policy SI 4 - Managing heat risk

Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.

A. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

- 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
- 2) minimise internal heat generation through energy efficient design
- 3) manage the heat within the building through exposed internal thermal mass and high ceilings
- 4) provide passive ventilation
- 5) provide mechanical ventilation
- 6) provide active cooling systems

Comment:

The cooling hierarchy has also been addressed (section 3.3.3).

Passive design measures have been incorporated including exposed ceilings, reduced glazing g-value, building orientation, external shading, openable windows.

The Energy and Sustainability Statement (section 7) addresses the Thermal Comfort for the new Teaching Block. An overheating assessment using CIBSE TM52 methodology has been carried out addressing the current and future weather files for London (DSY1 and DSY2).

The results section 7.1.1) confirm that the Teaching block passes the current weather file but fails in some areas for the future file. Purge ventilation has been proposed to overcome the overheating.

Active Cooling has been proposed for the dining Hall for the Teaching Block, activity and fitness studios in the New Sports Centre. And school hall auditorium.

Action:

None

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Policy SI 5 - Water Infrastructure

- A. In order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner.
- B. Development Plans should promote improvements to water supply infrastructure to contribute to security of supply. This should be done in a timely, efficient and sustainable manner taking energy consumption into account.
- C. Development proposals should;
 - 1) Through the use of Planning Conditions minimise the use of mains water in line with the optional Requirement of the Building Regulations (residential development) achieving mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption).
 - 2) Achieve at least the BREEAM Excellent standard for the 'Wat01' water category or equivalent (commercial developments)
 - 3) Incorporate measures such as smart metering, water saving and recycling measures, including retrofitting, to help to achieve lower water consumption rates and to maximise futureproofing.

Comment:

The provided two BREEAM Pre-assessment reports for the Existing and new Built spaces, confirm that three credits have been targeted using good sanitary fittings. This would achieve 40% improvement over baseline building water consumption which exceeds the minimum 12.5% improvement required to achieve the BREEAM excellent rating.

Action:

None