

Highgate School MSC 4 Phases

Sustainability Statement



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Executive Summary

This report has been prepared for the proposed development of Mallinson Sports Centre to show compliance with sustainability targets set by London Borough of Haringey, Greater London Authority (GLA) and Highgate School in the following documents:-

- Sustainable Design and Construction SPG (GLA) April 2014
- Sustainable Design and Construction SPD (Haringey)
- Highgate School SPD (Haringey)
- Environmental Sustainability Initial Strategy Plan (Highgate School)

The proposed development has been designed and will be constructed with a significant emphasis on sustainability. Key decisions in the design development including choice of materials, building design, energy efficient services and end of life disposal will be considered at design stage to ensure high levels of sustainable products and design is maintained.

This report uses the Building Research Establishment Environmental Assessment Method (BREEAM) New Construction 2018 to highlight sustainable design measures being proposed for the MSC development. This document along with the BREEAM pre-assessment identifies all credits targeted and explains how the credit is to be met. The report contains information taken from the following reports:

- Design and Access Statement
- Energy Statement
- Flood Risk and Sustainable Urban Drainage Strategy
- Ecology assessment
- Construction statement
- Air quality report

The report uses BREEAM new construction 2018 as the basis of pre-assessment. However, the works are scheduled as a later project within the school's five major projects.

The design team have undertaken a BREEAM pre-assessment (pre-registration) and energy workshop, including the appointment and involvement of Jeanne Davidson of Eight Associates as the BREEAM Approved Professional to review the building design and pre-assessment.

In line with London Borough of Haringey Local Plan Strategic Policy 4 Working towards a Low Carbon Haringey, the proposed development is designed to aim an 'Excellent' BREEAM rating and should be built to achieve a 'Very good' rating as a minimum.

- Management

The whole building elemental life cycle costing requires specially trained consultants using BRE-developed elemental life cycle costing computer software. This process is time-consuming and is generally only undertaken for BREEAM Projects targeting an 'Outstanding' rating. The design team concluded that the life cycle costing analysis would not be cost-effective as it would impart little helpful information on the project.

The project targets 13 out of a possible 21 credits to obtain a 'Very Good' rating. A further 3 credits could achieve.

- Health and Wellbeing

There are more accessible credits to target in other sections. Targeting 8 out of 18 credits which are standard achievable credits. The use of the building as a sports centre does not help achieve much well-being, which sets high standards general found in building design for sedentary occupations (working at a desk). It has not been

possible to provide windows or daylight to all where staff may be expected to spend more than one hour at work daily. Other wellbeing credits are not targeted as reliable credit because of onerous data collection, e.g., the design team and contractor. For example, achieving the indoor air quality credit requires the contractor to record all the paint, varnishes and adhesives used by all the subcontractors and purge the building of Volatile Organic Compounds before commissioning the ventilation system.

- Energy

The project targets 7 out of the 23 available credits, which will only achieve a "Very Good" rating. An 'Excellent' rating requires an additional 4 credits, which will be achieved using the 80kW PV array from the temporary building.

The additional energy credits are at risk as the Phase 2 to 4 works are interlinked with Phase 1 (Pool Hall refurbishment). As the building contains new elements, the BREEAM Assessment includes the whole building as a new structure. This makes achieving the additional 4 credits very difficult. As the last project, the PV array from the temporary building will be installed on the MCS roof. The 80kW PV array will help to ensure that the mandatory level for excellent rating can be achieved.

- Transport

Highgate Village has relatively poor public transport connections for London, as it is generally at the end of bus routes and has no tube station. This has resulted in the loss of almost half the transport credits. There is a limited opportunity for improving transport links as assessed by the BREEAM process. The school should commission a travel plan for the whole, covering and promoting various sustainable transport routes for the students and staff.

The "Excellent" rating requires targeting 6 out of 11 credits; additional credits are site related and unlikely to be achieved.

- Materials

The material credits are very challenging to achieve, as it requires accurate data collection early in the design process, with information being carried forward to the contractor. These credits are easily lost when records of quantities and volumes are lost, and suppliers are changed due to stock availability.

The 'Very Good' rating only requires targeting 5 out of 14 credits, whereas the 'Excellent' rating assumes 13 out of 14 credits are difficult to achieve and require good communication with the architect contractor and BREEAM Assessor. The Client should work proactively with the design team to meet these credits.

- Waste

Targeting 9 out of 10 waste credits to achieve an excellent rating. Many London construction site waste contractors recycle over 90% of the construction waste. A component contractor should exceed best practice standards and will not have too much difficulty managing and auditing the demolition and construction waste streams. The school working with the architect, has provided space for recycling operational waste streams (plastic, paper, glass and metal).

The demolition report covers climate change, and end-of-life disassembly would need to be undertaken as part of the early design process.

- Land Use and Ecology

An ecologist and landscape designer have been employed, and the design was developed to achieve 11 out of the possible 13 credits To achieve an 'Excellent' rating.

- Pollution

All standard pollution credits, such as air quality, light pollution, surface water run-off, and noise, are targeted to meet an 'Excellent' rating with 10 out of 12 credits. An additional 2 credits are available if a low global warming-depleting refrigerant is used in all air source heat pumps.

Management	21	13	16	62%	76%	11%	6.8%	8.4%
Health and Wellbeing	18	12	14	67%	78%	14%	9.3%	10.9%
Energy	25	11	14	44%	56%	16%	7.0%	9.0%
Transport	11	6	6	55%	55%	10%	5.5%	5.5%
Water	9	7	7	78%	78%	7%	5.4%	5.4%
Materials	14	5	13	36%	93%	15%	5.4%	13.9%
Waste	10	6	8	60%	80%	6%	3.6%	4.8%
Land Use and Ecology	13	6	9	46%	69%	13%	6.0%	9.0%
Pollution	12	9	11	75%	92%	8%	6.0%	7.3%
Innovation	10	1	1	10%	10%	10%	1.0%	1.0%
						Total	56%	75%
							Very good	Excellent

Table 1Summary BREEAM Assessment score

BREEAM pre-assessment tables in Appendix A confirm targeted credits that will form basis of the design and the design team will aim to achieve an 'Excellent' (XL) rating but it is expected that some of the targeted credits may not be achieved due to constraints such as working with existing buildings, excessive costs, construction complications and therefore a minimum of 'Very good' (VG) rating will be achieved.

London Borough of Haringey will also expect Highgate School to target an 'Excellent' rating for the proposed development in accordance with LBH Local Plan SP4. 'Very good' (VG) rating is lower risk and highly achievable whereas the targeted 'Excellent' (XL) includes higher risk credits and may not be achieved.

BREEAM Rating	% Score	%
Outstanding	≥ 85	99%
Excellent	≥ 70	84%
Very good	≥ 55	69%
Good	≥ 45	55%
Pass	≥ 30	44%
Unclassified	< 30	30%

Table 2 BREEAM Score Ratings

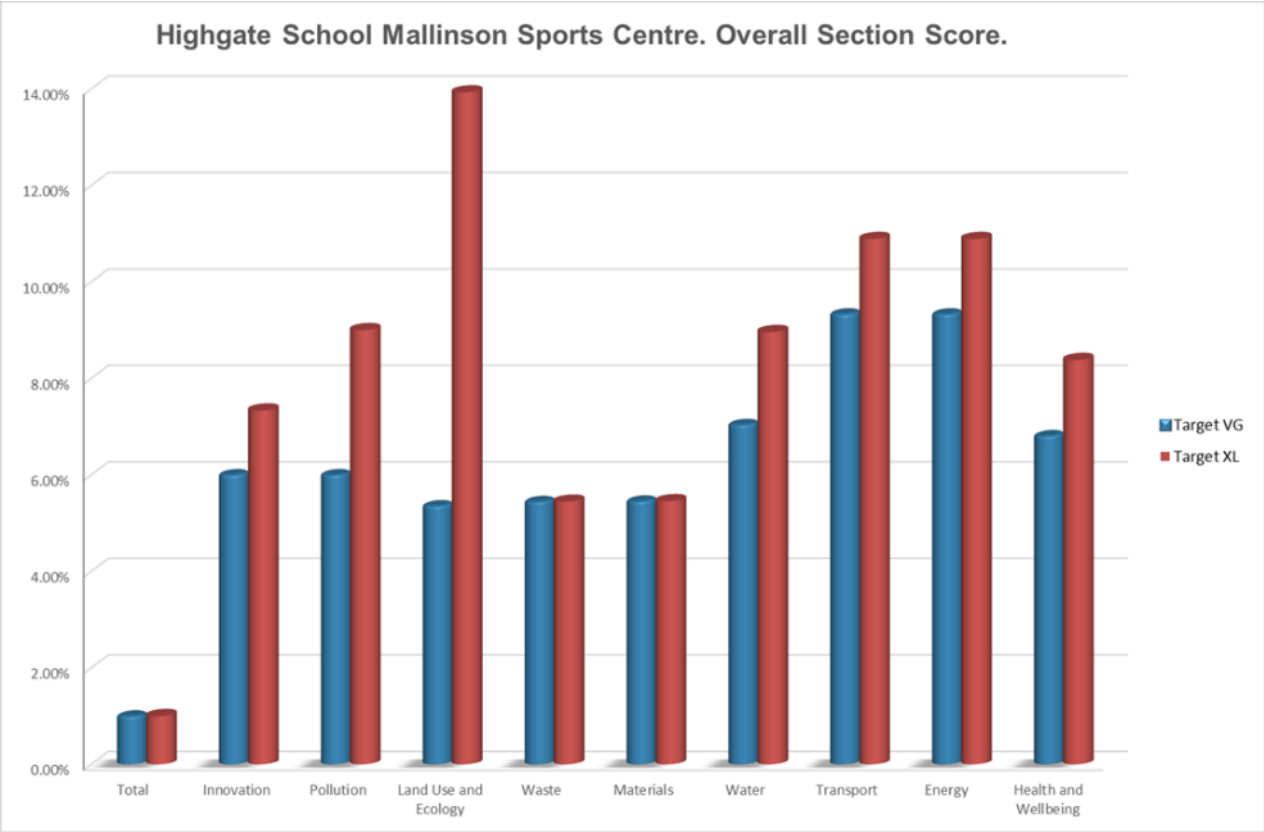


Figure 1 BREEAM Overall Percentage Credits

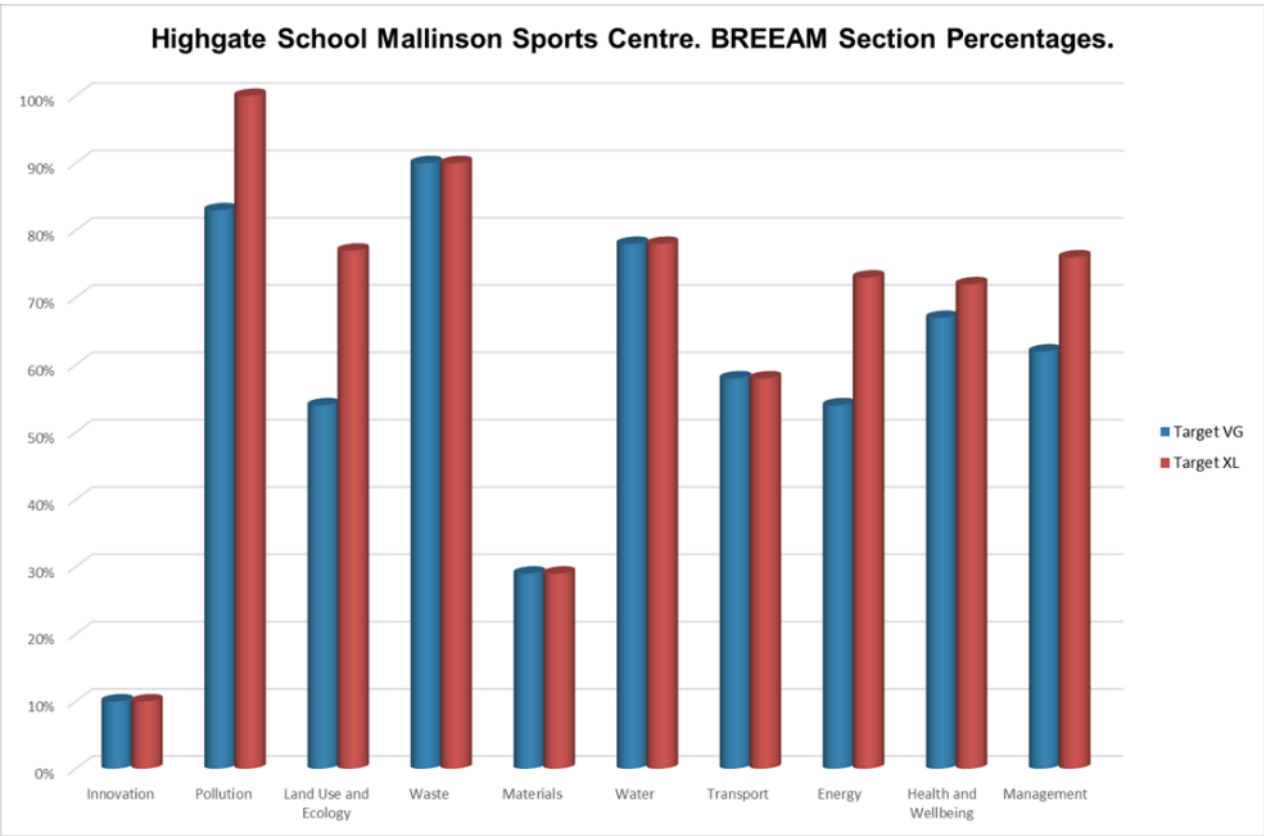


Figure 2 BREEAM Section Credits.

1

Introduction

- 1.1
- Highgate School has commissioned Peter Deer and Associates to provide a sustainability statement to accompany the planning application for redevelopment and extension of Mallinson Sports Centre, Bishopswood Road, Highgate, London.
- 1.2
- The purpose of this document is to outline the information required for this project to demonstrate that highest levels of sustainable measures will be incorporated into the building design.
- 1.3
- The sustainable building design will be assessed using BREEAM new construction 2018 to demonstrate that the development is predicted to achieve a minimum of BREEAM 'Very Good' rating and the design will aim to target a BREEAM 'Excellent' rating, in line with London Borough of Haringey strategic policy SP4: Working towards a Low Carbon Haringey
- 1.4
- This document should be read in conjunction with:
 - Design and Access Statement
 - Energy Statement
 - Flood Risk and Sustainable Urban Drainage Strategy
 - Ecology assessment
 - Construction statement
 - Air quality report

Site

- 1.5
- The Mallinson Sports Centre (MSC) is located on the Bishopswood Road campus of the school estate near other principal school buildings such as the Mills Centre, the Dining Hall, the Pre-preparatory School, and the Junior School.

Site address

Mallinson Sports Centre

Bishopswood Road,

London.

N6 4PH
- 1.6
- The main building comprises the Pool Hall and associated changing rooms, which was the first building on the site in 1969, followed by the main sports hall with associated ancillary accommodation, gym, entrance hall, central offices and other sports spaces completed in 1989.
- 1.7
- The overriding aim of the design seeks to transform this building and create enhanced building aesthetics within the Conservation Area whilst providing all the sports and ancillary-related facilities that the school will need soon.
- 1.8
- The intention is to retain the essential elements of the existing building that have significant long-term value and condition, providing spaces of the required technical standard, and integrating them with alterations and extensions into a unified whole, a single sports centre.
- 1.9
- The new sports hall is the principal component of the proposed Development of the School's indoor sports facilities. As part of the work, the school intends to demolish the existing Fives Court and Squash Courts

building to open a large area within the site that can be more efficiently and architecturally developed. These works are also designed to incorporate a new sports centre building comprising an indoor sports hall, teaching classrooms and staff offices.

- 1.10
- The hall's design is to accommodate a National Standard Netball Court within the hall, one that will allow Premier League games to be played. There is an aspiration nationally for netball courts of this standard, for a sport that is increasing in popularity. Many other sports courts will fit within this same interior footprint.

The Vision

- 1.11
- The proposed development is auxiliary to several other applications in various parts of the school. The vision behind all the proposed developments at the school is set out in the planning statement accompanying the applications, an extract of which is reproduced as follows:

“Being both a Charity and a School, sustaining and further improving what Highgate does for the benefit of its pupils and pupils of partner schools elsewhere within the borough is never finished business.”

“The school has, over the last 15 years or so, been undertaking an extensive programme of modernising and renewing its extensive and mixed stock of buildings and facilities to meet the educational and other demands of a 21st Century establishment. Significant funds have been invested over that period, and the programme will continue over the next decade.”

“This programme combines the continuing need to maintain, both in terms of safety and appearance, the buildings on several sites and in varying degrees of condition, with the need to provide essential, flexible, good quality and long-lasting educational facilities for its varied educational and charitable objectives, as well as catering for its diverse pupil-body, which meets the different educational and supporting requirements for each of the three Schools to satisfy Department of Education (DfE) and other statutory requirements.”

Community Uses

- 1.12
- The Mallinson Sports Centre is currently available to the community for use outside School hours. There are public uses for the outdoor pitches and the indoor sports centre, including other schools and sports clubs. In the holidays there are also holiday camps and other activities. The options for public use are noted as follows on the Camden Cindex website:

Private school facilities are available to the public. Term-time sports activities for children aged 5-14. School holiday courses include multi-activity, football, cricket, tennis, and dance. Facilities for adults include squash, fitness suite and tennis (courts available), 25m x 12.5m swimming pool. Children's parties for 5-15-year-olds (maximum 25 children) are available at weekends, including a variety of sports options and games and swimming sessions. Bouncy castle party available for children aged 5-7 years. Swimming club.



Figure 3 Aerial View of the site in Red

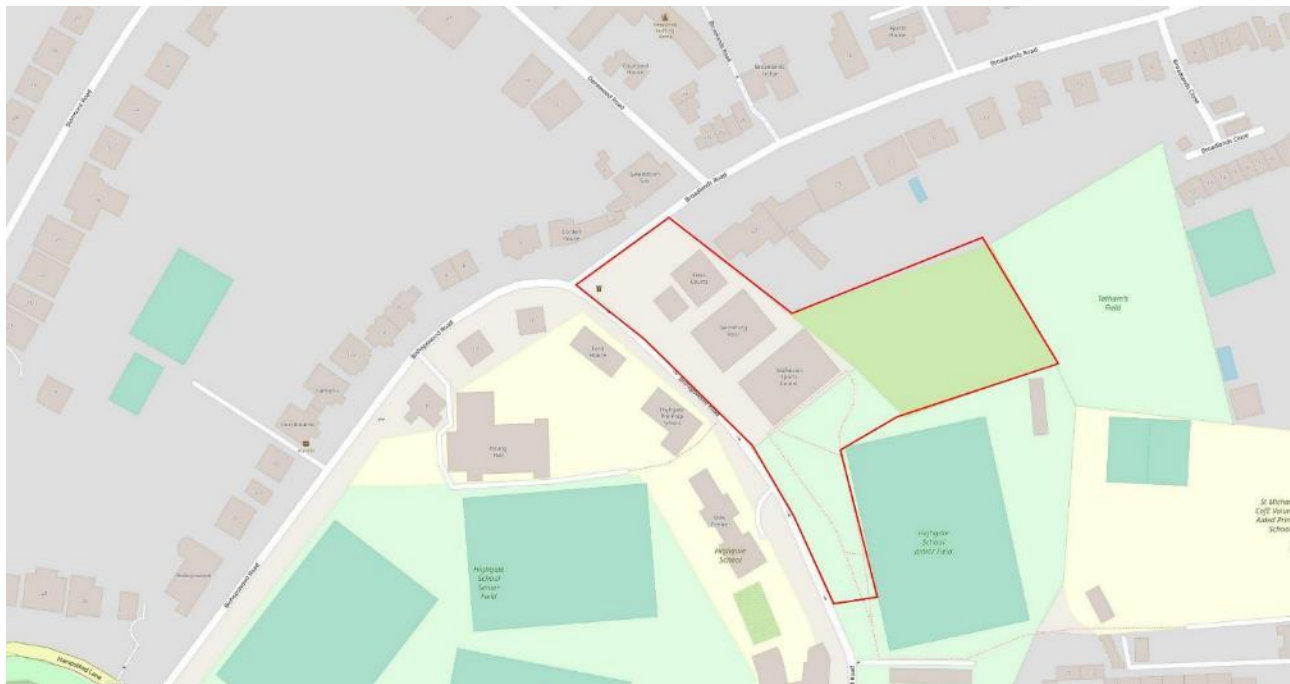


Figure 4 Site Location in Context (Open Street Map)

The Proposed works

1.13 The new extensions will create a larger building with various sports facilities, including a second sports hall, which will also be used for other School events, parent evenings, examinations, and assemblies.

1.14 The principle of a single secure point of access at the south end is to be maintained, with a larger and more open entrance and foyer fronting the all-weather pitches. Once inside the foyer via a draught lobby, the main Sports Centre reception desk immediately controls the area, which will always be staffed during regular operational hours. The desk will be open within the space to create a friendly and welcoming impression for pupils and visitors and improve visibility. It is anticipated that turnstiles will be used to control and monitor access into the sports centre – Turnstiles are provided at the west entrance next to the second hall. Turnstiles and entry doors would all be linked to the building fire alarm and detection system and default to open in the event of a fire for emergency egress.

1.15 As a result of the proposed extensions, new lifts will allow complete accessibility for disabled users to all areas of the building which is not currently wheelchair accessible.

1.16 Generally, during the school Day, the main doors will be openable, the entry doors being on automatic electric opening systems for disabled and Part M access. After School hours, it is anticipated that the main doors at both entrances will have access security control, operated by coded entry devices with magnetic closing locks. An option being investigated is to have the entry systems operated by pupil and staff cards, which will also serve several other functions in the school.

- 1.17 The proposed works in this submission include:
- The Fives Court and Squash Courts building is being demolition at the site's north end. The removal of the outer games court area and high chain-link fencing.
 - New north-west extension for a second indoor sports hall with associated:
 - new circulation corridor,
 - viewing gallery,
 - access stairs and lift,
 - ancillary spaces for storage and plant, and
 - A teaching block extension for 'Combined Cadet Force' and 'Outdoor Education' classrooms, offices, and associated storage.
 - A new south extension to the existing sports hall for eight (8) no. New external covered Fives Courts with run-off area.
 - New southwest extension and alterations to the existing building to create an enhanced entrance with a foyer, reception, and café. Including a bespoke staircase down to the current changing rooms.
 - New roof to sports hall 1 with new roof lights adding natural daylight to the and improved thermal comfort.
 - The courtyard between the pool hall and sports hall 1 will be covered to provide additional space. The space provides new dance studio and weights gym spaces and forms connections back to the changing rooms, with ancillary external storage for sports.
 - The external surrounding is improved with new hard and soft landscaping around the site's perimeter, including removing three trees. The trees will be replaced with new semi-mature trees and form an entrance courtyard area at the new south main entrance.

1.18 The swimming pool and changing rooms refurbishment project completed in 2020 is the first phase of these works and provides the changing room facilities for the following sports hall phases.

1.19 The proposed works will modernise this important indoor sports facility with alterations and extensions and significantly extend the life of the retained elements of the existing building while also providing significant improvements to accessibility, energy efficiency and reduction of the carbon footprint of the whole Development.

Landscaping & External Works

- 1.20 The design strategy for the new sports centre is to:
- Create new landscape areas which maximise the amount of planting so that the new building becomes a recognisable and embedded part of the school’s landscape and estate.
 - Introduce new tree planting.
 - Provide low-level, safe, and efficient lighting for students and visitors.
 - Surface the paths with permeable paving as part of a sustainable drainage system.
 - Utilise a no-dig construction methodology to prevent damage to tree roots where necessary.
- 1.21 The design strategy for the Orchard site is to:
- Create a new outdoor sports area with a unique and elegant oval-shaped amphitheatre that will provide seating around the pitch and act as a barrier and flood water storage device to prevent future flooding events.
 - Introduce new tree planting.
 - Provide accessible and safe access to the sports pitches for students and visitors and connect with other areas of the School.
 - Utilise a no-dig construction methodology to prevent damage to tree roots where possible.
 - Minimise any impacts on the most valuable, existing trees around the site.
- There are mature trees around the site perimeter, between the MSC and the Orchard site, and all-round and to the east of the Orchard site, where there is a small natural wood.

2 Planning Policies

National Planning Policy

- 2.1
- The National Planning Policy Framework ('NPPF') was published in 2021 which superseded the 2012, 2018 and 2019 versions. Paragraphs 2 and 12 within the Framework confirm that the NPPF must be considered a material planning consideration in planning decisions.
- 2.2
- To ensure that sustainable Development is pursued positively, a presumption favouring sustainable Development is at the heart of the NPPF. Sustainable Development is explained in more detail in NPPF paragraph 11, which requires Local Planning Authorities to:
- 2.3
- Approve development proposals that accord with an up-to-date development plan without delay; or
- 2.4
- Where there are no relevant development plan policies or the policies which are most important for determining the application are out-of-date, granting permission unless:
- 2.5
- Applying policies in the framework that protect areas or assets of particular importance provides an apparent reason for refusing the development proposed; or
- 2.6
- Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits when assessed against the policies in this framework when taken as a whole
- 2.7
- The NPPF includes a 'presumption in favour of sustainable Development. It states that for plan-making, the presumption means that local authorities should positively seek opportunities to meet the development needs of their area and that plans should meet objectively assessed needs. Plans should also be based on the Local Plan.

London Plan

- 2.8
- The London Plan is the Mayor's planning strategy for Greater London. It sets borough-level housing targets and identifies locations for future growth of London-wide importance.
- 2.9
- The London Plan is the overall strategic Plan for London, setting out an integrated economic, environmental, transport and social Framework for the Development of London over the next 20 to 25 years.
- 2.10
- The London Plan is part of the Development Plan. The policies have been drafted to allow London to implement this ambitious London Plan as soon as possible. There is no requirement for the policies to be repeated locally. However, some instances require a local approach within the overall policy context. The London Plan sets out where this is the case.
- 2.11
- The London Plan provides the strategic framework for making all these decisions. It guides boroughs' Development Plans to ensure they work toward a shared vision for London. It establishes policies that allow everyone involved in new developments to know what is expected.

Policy SI 2 Minimising greenhouse gas emissions	
A)	Major Development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand under the following energy hierarchy: • be lean: use less energy and manage demand during operation • be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly • be green: maximise opportunities for renewable energy by producing, storing, and using renewable energy on-site • be seen: monitor, verify and report on energy performance.
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.
C)	A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for significant Development. Residential Development should achieve 10 per cent, and non-residential Development should achieve 15 per cent through energy efficiency measures. Where it is demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the Borough, either: D) Through cash in lieu contribution to the Borough's carbon offset fund, or E) off-site provided that an alternative proposal is identified and delivery is certain.
F)	Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported annually
G)	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.
H)	Development proposals to the Mayor should calculate whole lifecycle carbon emissions through a nationally recognised Whole Lifecycle Carbon Assessment and demonstrate actions to reduce lifecycle carbon emissions.

Table 3 GLA Policy SI 2 Minimising greenhouse gas emissions

- 2.12
- The Mayor is committed to London becoming a zero-carbon city. Becoming zero-carbon will require reducing all greenhouse gases, of which carbon dioxide is the most prominent. London homes and workplaces are responsible for producing approximately 78 per cent of its greenhouse gas emissions. New Development must meet the framework's requirements if London aims to become a zero-carbon city by 2050. Development involving major refurbishment should also strive to meet this framework.
- 2.13
- The energy hierarchy should inform new buildings' design, construction, and operation. The priority is to minimise energy demand and address how energy will be supplied and renewable technologies incorporated. An essential aspect of managing demand will be to reduce peak energy loadings.
- 2.14
- Boroughs should ensure that all developments maximise on-site Electricity and heat production opportunities from solar technologies (photovoltaic and thermal) and use innovative building materials and intelligent technologies. This approach will reduce carbon emissions, reduce energy costs to occupants, improve London's energy resilience and support the growth of green jobs.
- 2.15
- A zero-carbon target for significant residential developments has been in place for London since October 2016 and applies to significant non-residential developments on the final publication of this Plan.
- 2.16
- Meeting the zero-carbon target - an on-site reduction of at least 35 per cent beyond the baseline of Part L of the current Building Regulations is required.
- 2.17
- The minimum improvement over the Target Emission Rate (TER) will increase over time to achieve the net zero-carbon London ambition and reflect the costs of more efficient construction methods. The net-zero target costs will be reflected in future updates to the London Plan.
- 2.18
- The Mayor recognises that Building Regulations use outdated carbon emission factors and that this will continue to cause uncertainty until Government updates them. Interim guidance has been published in the Mayor's Energy Planning Guidance on using appropriate emissions factors. The GLA guidance will be updated once Building Regulations are updated to help developers determine how these policies are implemented.

2.19 Developments are expected to achieve carbon reductions beyond Part L from energy efficiency measures alone to reduce energy demand as far as possible. Residential Development should achieve 10 per cent, and non-residential Development should achieve 15 per cent over Part L.

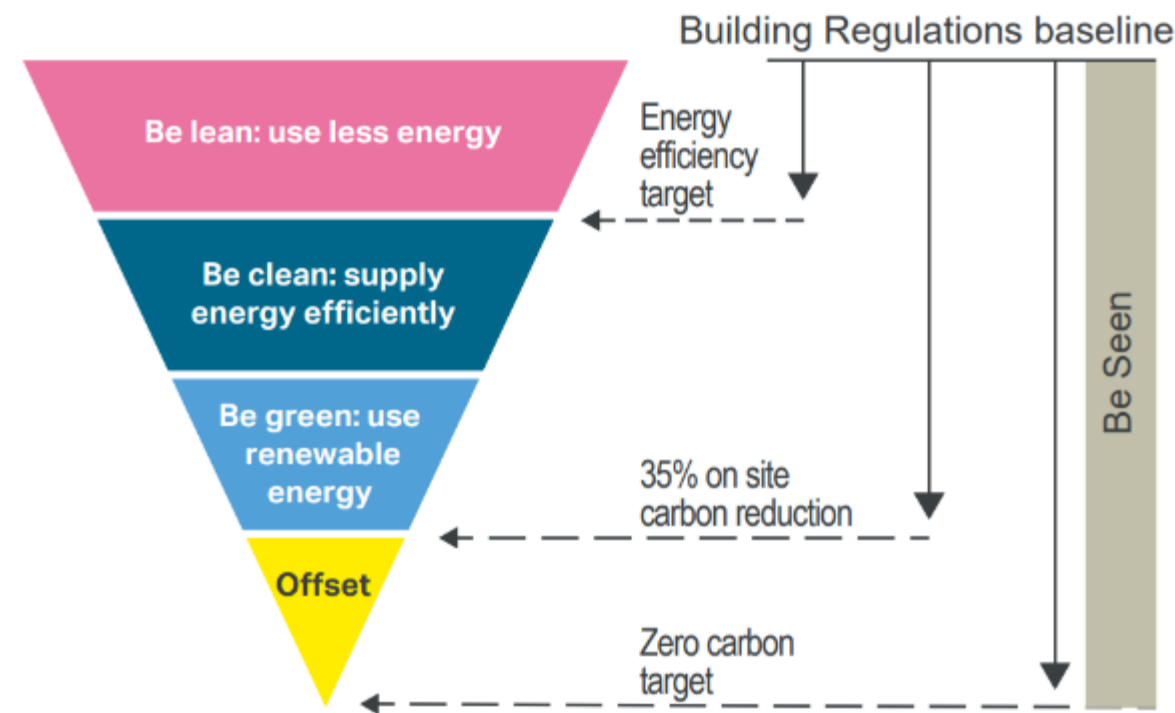


Figure 5 London plan Energy Hierarchy.

- 2.20 The price for offsetting carbon is regularly reviewed. Changes to the GLA's suggested carbon offset price will be updated in future guidance. The new Development is expected to get as close as possible to zero-carbon on-site, rather than relying on offset payments to make up for any shortfall in emissions. However, offset funds can unlock carbon savings from the existing building stock through energy efficiency programmes and by installing renewable technologies – typically more expensive to deliver in London due to the building's age, type, and tenure.
- 2.21 The Mayor will work with boroughs, energy companies, and major developers to promote London's energy system's timely and effective Development (energy production, distribution, storage, supply, and consumption).
- 2.22 London is part of a national energy system and currently sources approximately 95 per cent of its energy from outside the GLA boundary. Meeting the Mayor's zero-carbon target by 2050 requires changes to how we use and supply energy to generate power and heat for our buildings and transport from clean, low-carbon, and renewable sources. London will need to shift from relying on natural gas as its primary energy source to a diverse range of low and zero-carbon sources, including renewable energy and secondary heat sources. Decentralised energy and local secondary heat sources will become an increasingly important element of London's energy supply. They will help London become more self-sufficient and resilient concerning its energy needs.

Policy SI 3 Energy Infrastructure

- A) Boroughs and developers should engage with relevant energy companies and bodies early 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 outlined in Part A and other opportunities), establishing the most effective energy supply options. Energy masterplans should identify:
- 1) significant heat loads (including anchor heat loads concerning 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 of road works
 - 9) infrastructure and land requirements for electricity and gas supplies
 - 10) implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
 - 11) opportunities to maximise renewable Electricity generation and incorporate demand-side response measures.
- 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 and 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 Electricity following 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)
 - b) 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)
 - c) use ultra-low NOx gas boilers
 - d) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
 - e) where a heat network is planned but not yet in existence, the Development should be designed to allow a cost-effective connection later.
- E) Heat networks should achieve good practice design and specification standards for primary, secondary, and tertiary systems comparable to those in the CIBSE/ADE Code of Practice CP1 or equivalent.

Table 4 GLA Policy SI 3 Energy Infrastructure

- 2.23 The heating system should be designed to facilitate cost-effective future connections where developments are proposed within Heat Network Priority Areas but are beyond existing heat networks. Future connections may include, for example, allocating space in plant rooms for heat exchangers and thermal stores, safeguarding suitable routes for pipework from the site boundary and making provision for connections to the future network at the site boundary. The Mayor is taking a more direct role in delivering district-level heat networks. Newer communally heated developments will connect to them and develop a comprehensive decentralised energy support package. Further details are available in the London Environment Strategy.
- 2.24 Electricity is essential for the functioning of any modern city. Demand is expected to rise in London in response to a long-term growing population and economy, the increased take-up of electric vehicles, and the switch to electric heating systems (such as through heat pumps). The Electricity network and substations are at or near capacity in several areas, especially in central London. The Mayor will work with the Electricity and heat industry, boroughs, and developers to ensure that appropriate infrastructure is integrated within a more comprehensive smart energy system designed to meet London's needs.

Policy SI 4 Managing Heat Risk.

- A) Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials, and green infrastructure.
- B) Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems following 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.

Table 5 GLA Policy SI 4 Managing Heat Risk

- 2.25 Climate change means London is already experiencing higher than historical average temperatures and more severe hot weather events. Higher temperatures combined with a growing population, urbanisation, and the urban heat island effect, means London must manage heat risk in new developments, using the cooling hierarchy above. The cooling hierarchy applies to major developments, and the principles can also be applied to minor Development.
- 2.26 In managing heat risk, new developments in London face two challenges – the need to ensure London does not overheat (the urban heat island effect) and that individual buildings do not overheat. The urban heat island effect is caused by extensive built-up areas absorbing and retaining heat day and night, leading to parts of London being several degrees warmer than the surrounding area. The extra-urban heat can become problematic on the hottest days of the year as daytime temperatures can reach well over 30°C and not drop below 18°C at night. These circumstances can lead many people to feel too hot or not sleep, but for specific health conditions and 'at risk' groups, such as some young or elderly Londoners, the effects can be severe and worsen health conditions. Green infrastructure can mitigate this effect by shading roof surfaces and through evapotranspiration. Development proposals should incorporate green infrastructure in line with Policy G1 Green Infrastructure and Policy G5 Urban Greening.

London Borough of Haringey Policies

- 2.27 Haringey's Local Plan is made up of several individual planning policy documents. These are Haringey's Local Plan Strategic Policies 2013 – 2026 (formerly the Core Strategy) March 2013. Consolidated with alterations since 2017, it sets out the Council's spatial strategy and critical policies for the Borough's future development through to 2026.

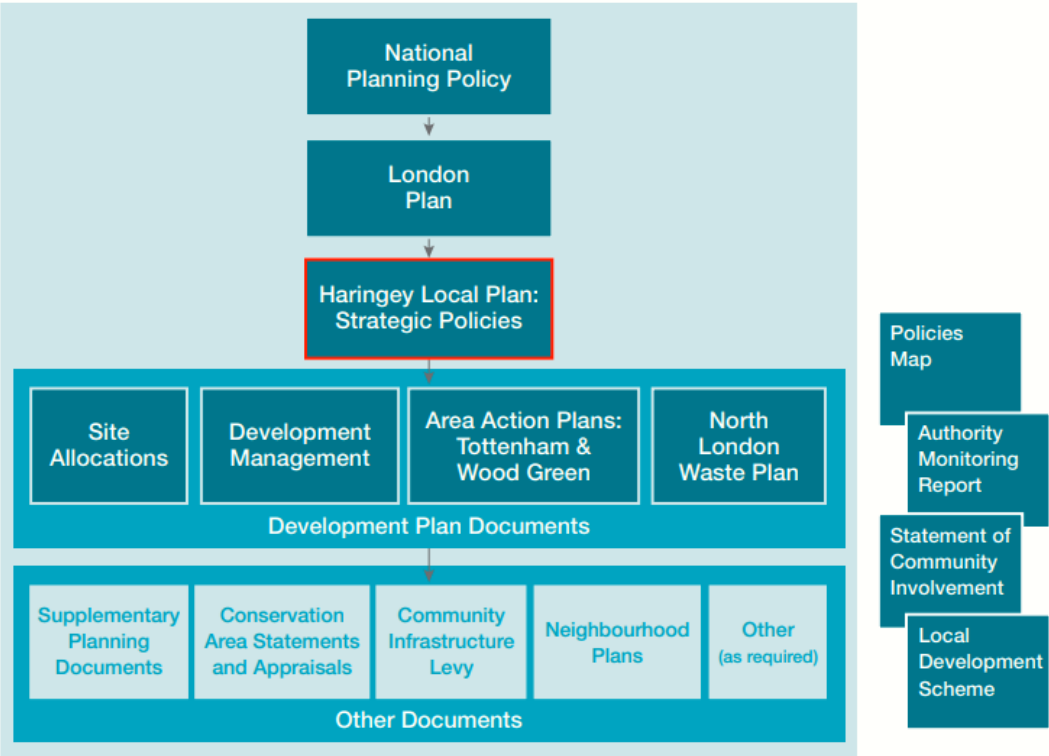


Figure 6 Haringey Local Plan

- 2.28 SP4 Working towards a Low Carbon Haringey. The Local Plan has an essential role in reducing Haringey's environmental impact and achieving sustainable Development. Meeting Haringey's social, environmental, and economic needs in ways that protect the environment and do not harm our ability to meet our needs in the future. An environmentally sustainable future is one of the priorities of Haringey's Sustainable Community Strategy.

SP 4 Working towards a Low Carbon Haringey

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

1) 1. In line with the London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction, and occupation by incorporating the following measures:

a) From 2011 onwards, all new residential Development will achieve a minimum 25% reduction in total (regulated) CO₂ emissions in line with Code for Sustainable Homes Level 4 energy standards and should aim to achieve Level 6. All new residential Development shall be zero carbon from 2016 onwards: and

b) From 2011 onwards, all new non-residential Development shall be built to at least BREEAM "very good" standard and aim to achieve BREEAM "excellent" or the current nationally agreed standard. All new non-residential Development shall be zero carbon from 2019.

2) 2. The Council will promote low- and zero-carbon energy generation through the following measures:

a) Requiring all developments to assess, identify and implement, where viable, site-wide, and area-wide decentralised energy facilities, including the potential to link into a wider network.

b) Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible.

c) Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks, including the potential in the Upper Lee Valley Opportunity Area; and

d) Where viable, all new developments are required to reduce predicted carbon dioxide emissions by 20% from on-site renewable energy regeneration, including connections to local sources of decentralised renewable energy.

Development Management DPD (Adopted July 2017)

2.29 The Development Management Plan sets out Haringey's spatial strategy for managing Development and growth in the Borough up to 2026. The Local Plan provides a positive framework for ensuring that housing, employment, infrastructure, and other needs are met to contribute to sustainable Development in both the

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Borough and Greater London. Several key objectives, which are set across five overarching themes, as follows, guide the Local Plan:

- People are at the heart of change.
- An environmentally sustainable future.
- All share economic vitality and prosperity.
- Safer for all; and
- Healthier people with a better quality of life.

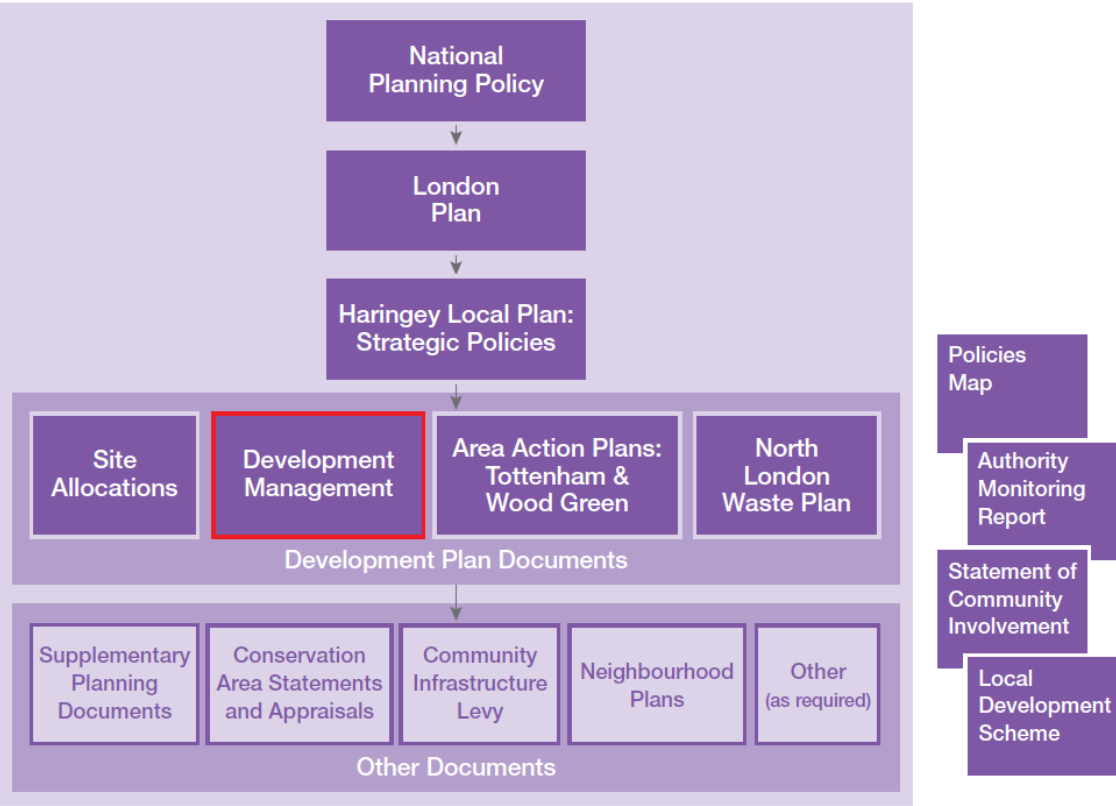


Figure 7 London Borough of Haringey Policy Hierarchy

Policy DM21: Sustainable Design, Layout and Construction

- A) All new Development, including building and landscape works, will be expected to consider and implement the sustainable design, layout, and construction techniques. Proposals should:
- a) Apply the energy hierarchy to minimise energy use to meet and, if possible, exceed minimum carbon dioxide reduction requirements.
 - b) Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems.
 - c) Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls
 - d) Wherever possible, use building materials with high environmental performance ratings; and
 - e) Seek opportunities for locally sourced labour.
- B) The Council will support appropriate measures to retrofit existing homes and non-residential buildings sustainably.
- C) Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted.
- D) Consideration will be given to using carbon offset payments, to be secured by planning obligations, where it can be demonstrated that proposals cannot meet carbon dioxide emission reduction targets on-site.

Energy Efficiency

- 2.31 London Plan Policy SI 2 states that all new development proposals should make significant contributions to minimising greenhouse gas emissions following the energy hierarchy, as follows:
- Be lean: use less energy
 - Be clean: supply energy efficiently
 - Be green: use renewable energy
- 2.32 The first step in the hierarchy should be met by adopting sustainable design principles and reducing energy demand. The second step should be met by fulfilling energy requirement of the development efficiently by prioritising decentralised energy, for which local requirements are set below (see Haringey DPD Policy DM22). The third step is to use renewable energy.

Highgate School SPD

- 2.33 Highgate school SPD has been developed by London Borough of Haringey in partnership with the school. The document provides guidance and compliance criteria for any new developments within school's site.
- 2.34 In compliance with the SPD, the design of proposed MSC buildings is in line with existing buildings within the area while providing enhanced building performance to reduce energy usage and carbon emissions.
- 2.35 The SPD also encourages new developments to consider enhancing biodiversity in the area. Green roofs have been incorporated into the design of MSC buildings which will enhance the biodiversity in the area as well as improving thermal performance of the building.

Policy DM21: Sustainable Design,

- 2.30 The principles of sustainable design, layout and construction are set out in London Plan (2021). The principles cut across a few policies in this Local Plan, and all proposals should positively respond to them by engaging with the Haringey Development Charter (see Policy DM1). Applying sustainable design principles can help improve the environmental performance of buildings, making them more resilient to climate change and mitigating their effect on it. Sustainable design and construction, therefore, provide clear environmental advantages. It also offers social and economic benefits. Sustainable design results in more efficient buildings with cheaper operating costs, benefiting future owners or occupiers, particularly those at risk of fuel poverty.

Layout and Construction

Policy DM22: Decentralised Energy

A) Subject to other policy requirements, proposals contributing to the provision and use of Decentralised Energy network infrastructure will be supported.

Communal energy systems

B) All Development that incorporates site-wide communal energy systems should examine opportunities for extending such systems, irrespective of whether it is connected to a DE Network.

C) All Development incorporating site-wide communal energy systems should optimise opportunities for extending such systems beyond the site boundary to supply energy to neighbouring existing and planned future developments.

Existing and planned future DE networks

D) All development proposals should prioritise connection to existing or planned future DE networks.

E) All major Development located within 500 metres of an existing DE Network, and minor new-build Development located within 25 metres, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.

F) All major Development located within 500 metres of a planned future DE Network, considered by the Council likely to be operational within 3 years of a grant of planning permission, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.

DE network' connection zones.'

G) All major Development located within 500 metres of a DE network' connection zone' should be designed for connection to a DE network.

H) All minor new-build Development located within 25 metres of a DE network' connection zone' should be designed for connection to a DE network.

Customer charters

I) Where site-wide communal and district heating systems are operational, the Council strongly encourages heat and energy service providers to enter customer charters with domestic and micro-business customers.

- 2.36
- Decentralised energy is supported by national and regional policy as a means of meeting the requirements of the Climate Change Act on carbon emission reduction. The London Plan aims to shift from the use of natural gas to a more diverse range of low carbon and renewable sources. Decentralised energy and secondary heat sources will become and increasingly important element of London’s energy supply in the future. Decentralised energy will help London become more self-sufficient and resilient in relations to its energy needs.
- 2.37
- Policy SP4 broadly supports DE networks as part of a package of measures to assist in delivering more energy efficient Development and working towards a low-carbon Borough. In line with the London Plan, all development proposals will be expected to select energy systems following the Mayor's energy hierarchy. This policy sets further detailed requirements to assist with implementing these strategic objectives.
- 2.38
- All major Development should incorporate site-wide communal energy systems that serve all energy demands within the Development from a standard system, irrespective of whether it is connected to a DE network. Proposals should consider systems connecting different uses and building groups within and extending beyond the development site.

Overheating and cooling

- 2.39
- Development proposals should seek to integrate the cooling hierarchy following sustainable design, layout, and construction principles. Helping to ensure that buildings are better equipped to manage their cooling needs in Energy efficient ways over their lifetime. This policy applies the cooling hierarchy set out in the London Plan:
1.

Minimise internal heat generation through Energy efficient design
2.

Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls
3.

Manage the heat within the building through exposed internal thermal mass and high ceilings
4.

Passive ventilation

5.
- Mechanical ventilation
6.
- Active cooling systems (ensuring they are the lowest carbon options)
7.
- Sustainable retrofitting

- 2.40
- Existing building stock in Haringey factors significantly in local carbon emissions. The Borough's interactive heat loss map 12 indicates that many properties in the area are energy inefficient. Sustainable retrofitting offers an opportunity to improve existing buildings' environmental performance, remarkably where conversions, refurbishments, changes of use and extensions are proposed.

Enhancing biodiversity

- 2.41
- Urban greening can contribute to biodiversity, amenity, and climate change adaptation. Living roofs (green and brown roofs) and green walls offer many environmental benefits, such as improving the thermal performance of buildings, reducing on-site energy demands, and limiting the 'urban heat island effect'. They also contribute to sustainable drainage by absorbing rainfall, reducing run-off and improving water quality.

Materials and locally sourced labour

- 2.42
- The type and source of materials used for the construction of buildings have a significant impact on sustainability. It is common for building materials and their components to be assessed regarding their environmental impact across their entire life cycle, including through energy ratings. The Council encourages applicants to use materials with high environmental performance ratings wherever possible.

Carbon Offsetting

- 2.43
- The London Plan provides that boroughs may establish carbon offsetting arrangements to maximise carbon emission reductions. Carbon costing will be established using a recognised carbon price in line with London Plan supplementary planning guidance or further local guidance as appropriate. Subject to Government and regional policy, the Council will consider using carbon offsetting payments where it can be suitably demonstrated that proposals cannot meet carbon emissions reduction targets on-site. Further details in this regard are set out in the Council's Planning Obligations SPD.

3 BREEAM Pre-assessment

- 3.1 BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a newly constructed building with other BREEAM-rated buildings and the typical sustainability performance of a stock of new non-domestic buildings in the UK.
- 3.2 In this respect, each BREEAM rating broadly represents performance equivalent to:
- Outstanding: Less than the top 1% of UK new non-domestic buildings (innovator)
 - Excellent: Top 10% of UK new non-domestic buildings (best practice)
 - Very Good: Top 25% of UK new non-domestic buildings (good, advanced practice)
 - Good: Top 50% of UK new non-domestic buildings (good intermediate practice)
 - Pass: Top 75% of UK new non-domestic buildings (standard good practice)
- 3.3 This BREEAM UK New Construction Scheme can be used to assess and rate the environmental impacts arising from a newly constructed building development (including external site areas) at the following life cycle stages:
1. New Build Design Stage (DS) (optional) – leading to an Interim BREEAM rating and assessment certificate.
 2. New Build post-construction Stage (PCS) – leading to a Final BREEAM rating and assessment certificate.
 3. New Build Post-occupancy stage (POS) (optional) - leading to a certification relating to robust best practices to meet design aspirations in the following areas:
 - a. post-occupancy handover and commissioning processes
 - b. performance monitoring
 - c. actions undertake post-occupancy to understand and manage the actual performance of the building.
- 3.4 The BREEAM UK New Construction scheme is not designed to assess the environmental impacts of buildings at the following life cycle stages:
1. Existing building major and minor refurbishments and fit-outs (See the scope of BREEAM UK Refurbishment and Fit-out scheme)
 2. The existing building in operation or existing unoccupied building (BREEAM In-Use scheme)
 3. Existing building deconstruction (no BREEAM scheme for this life cycle stage at present)
 4. Infrastructure projects (BREEAM Infrastructure pilot scheme)
- 3.5 This project is being undertaken in 4 phases. The first phase, Pool Hall and changing room refurbishment, was completed in 2020. This application is for phases 2 to 4. The phased Development has complicated the BREEAM Assessment, designed around a typical building constructed by a single contractor. A BREEAM assessment was not required for Phase 1.
- 3.6 This project involves the refurbishment of an existing dry sports hall and the creation of a new additional dry sports hall with new interlinking access routes and an ancillary studio.
- 3.7 Over 60% of the building elements will be newly constructed. BRE will likely consider this project under the 2018 new construction assessment procedure. The alternative approach is to split the assessment into

two separate BREEAM Assessments (new construction and refurbishment). This results in duplication of the assessment process, adding considerable costs to the project.

- 3.8 The BREEAM assessment process adds significant costs to a project for BREEAM evidence collection, design reports, employment of BREEAM professionals and assessors and increased construction costs from the contractor to cover risk generated by not achieving the targeted BREEAM Rating.
- 3.9 Generally, a BREEAM Assessment adds value to a project to demonstrate adoption of high levels of design & construction methods. This is particularly useful for projects being developed for sale or rent as the developer can often recover the costs incurred by achieving higher rent or sales value, therefore, undertaking a full BREEAM assessment is not considered essential for this development.
- 3.10 The school can make better use of the financial resources to reduce their carbon impact on the environment by designing and building to the enhanced sustainability targets set by the school without undertaking the full BREEAM Assessment as the buildings are being constructed and not for sale or rent.
- 3.11 BREEAM pre-assessment tables in Appendix A confirm targeted credits that will form basis of the design and the design team will aim to achieve an 'Excellent' rating but it is expected that some of the targeted credits may not be achieved due to constraints such as working with existing buildings, excessive costs, construction complications and therefore a minimum of 'Very good' (VG) rating will be achieved.
- 3.12 There is a risk of not achieving an 'Excellent' rating when undertaking a full BREEAM assessment as a significant number of credits are usually attainable in new build developments as standard but cannot be achieved or incur major costs in refurbishment projects. For example:
- Management - There are significant additional costs in undertaking an elemental life cycle cost analysis to target the required credits but the cost analysis does not add any real value for the school.
 - Health and wellbeing – BREEAM requirements are set with a typical office or residential building in mind. The use of a sports hall is not comparable in meeting BREEAM requirements for natural daylight and views out of the building from desk height.
 - Energy – Design will be in accordance with the requirements of BREEAM as the school is dedicated to reduce their energy usage and carbon emissions but some of conventional passive design options will not be achievable due to the use of proposed buildings (sports hall).
 - Transport – Due to the location of MSC site being accessible from a small residential street with no public transport in immediate vicinity to the entrance of proposed buildings. Credits cannot be achieved due to the availability of public transport and proximity of amenities.
 - Materials – Some of the BREEAM requirements will be met as part of materials selection process derived following the whole life-cycle carbon assessment and circular economy assessment. Not all credits can be achieved due to the costs involved and a significant amount of existing building fabric being retained.
- 3.13 In complying with Haringey's Planning requirements and the school design standards, a BREEAM Rating of "Very Good" is achievable. However, there will still be some extra cost to the project for BREEAM evidence requirements if a full assessment is required.
- 3.14 In achieving the BREEAM "Very Good" rating, the design will be in the top 25% of new buildings.

	Possible Credits	Targeted Credits	Excellent Targeted Credits	% Of Credits Achieved for Very Good	% Of Credits achieved for Excellent	Category Weighting	Section Score	The score for an excellent rating
Management	21	13	16	62%	76%	11%	6.8%	8.4%
Health and Wellbeing	18	12	14	67%	78%	14%	9.3%	10.9%
Energy	25	11	14	44%	56%	16%	7.0%	9.0%
Transport	11	6	6	55%	55%	10%	5.5%	5.5%
Water	9	7	7	78%	78%	7%	5.4%	5.4%
Materials	14	5	13	36%	93%	15%	5.4%	13.9%
Waste	10	6	8	60%	80%	6%	3.6%	4.8%
Land Use and Ecology	13	6	10	46%	77%	13%	6.0%	10.0%
Pollution	12	9	11	75%	92%	8%	6.0%	7.3%
Innovation	10	1	1	10%	10%	10%	1.0%	1.0%
						Total	56%	76%
							Very good	Excellent

Table 6 BREEAM Predicted Credits

4 Management

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Management	21	13	16

- 4.1
- The project is proposed to be undertaken in two sections to keep the sports centre working effectively throughout the school year.
- 4.2
- Creating Employment Opportunities for local people
- 4.3
- The London Plan 2021 sets out requirements in its Policy E11 Skills and Opportunities for All to encourage boroughs to investigate, with the developers, the possibility of promoting local businesses and residents with the opportunity to apply for employment during the construction of the Development. The London Borough of Haringey draws on this requirement in its Policy SP8 Employment and Policy SP9 Improving Skills and Training to support access to jobs in LBH adopted Local Plan, whereby training and skills centres are promoted to provide skills to local people.
- 4.4
- During the construction process, there are many opportunities where an apprentice or trainee can be given an opportunity for employment or the Development of new skills. Often local higher education colleges have lists of possible candidates who may benefit from the experience. To meet the requirements of local employment, it is recommended that the selected contractor, as part of their employment, is encouraged to take on young apprentices or administration staff who live or study within the Borough.
- 4.5
- As this project involves refurbishing an existing building, additional employment is unlikely to be created. However, it is part of the overall improvement in maintaining the school's viability for the future. Therefore, it will contribute considerably towards secure employment in Highgate for many years.
- 4.6
- As part of the BREEAM Pre-assessment, a BREEAM Planning Meeting and Energy Workshop has been undertaken where project roles have been defined. A BREEAM Approved professional has been employed to review the planning stage design and documentation and make comments and recommendations to the design team.

Responsible Construction

- 4.7
- BREEAM recognised a responsible construction management scheme. These are third-party schemes evaluated by BRE Global for recognition under BREEAM. Refer to Guidance Note 33, available on the BREEAM website, for further guidance on recognised schemes and how they support Compliance with these BREEAM criteria.
- 4.8
- BREEAM awards credits for responsible construction management to recognise and encourage construction sites managed environmentally and socially considerate, responsible, and accountable. The main contractor must sign up for the considerate construction scheme and demonstrate safe construction management with accredited procurement processes.
- 4.9
- The Considerate Constructors Scheme (CCS) is a national initiative the UK construction industry set up to improve its image. The scheme is a self-financing, independent organisation owned by the Construction Umbrella Bodies (Holdings) Ltd (the Construction Products Association and the Construction Industry

Council). Sites and companies registering with the scheme sign up and are monitored against a Code of Considerate Practice, designed to encourage best practices beyond statutory requirements.

Pre-Demolition Audit

- 4.10
- As part of RIBA Stage 3 works, the design team will complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered prior to strip out. This will be considered if buildings can reuse or recycle to maximise material recovery for subsequent high-grade or value applications. The scope of the pre-demolition audit is
- 4.11
- Consider materials for reuse and set targets for waste management.
- 4.12
- Engage all contractors in the process of maximising high-grade reuse and recycling opportunities.
- 4.13
- Used to develop the contractor's resource management plan and to provide the relevant information for the contractor to set waste reduction targets and Key Performance Indicators (KPI)
- 4.14
- To help the contractor monitor waste arising and waste management routes used with those forecasts and investigate significant deviations from planned targets.
- 4.15
- The principal contractor will operate an environmental management system (EMS) covering their primary operations. The EMS will be either:
 - Third-party certified, to ISO 14001/EMAS or equivalent standard; or
 - Compliant with BS 8555:2016
- 4.16
- The principal contractor will implement best practice pollution prevention policies and procedures on-site following Pollution Prevention Guidelines, working at construction and demolition sites: PPG61

Construction Management Plan

- 4.17
- At this early RIBA planning stage 2, a contractor has not yet been appointed to undertake the construction works. However, the information and parameters within this document will form part of any tender documentation. The appointed contractor will be required to comply with the outlined methodology described.
- 4.18
- This statement describes the anticipated demolition and construction works programme and the critical activities undertaken on the site concerning the Development.
- 4.19
- The broad principles of a framework site-wide Construction Management Plan (CMP) are identified in this report. As part of the tendering process, the main contractors will be required to submit a statement demonstrating how they will comply with the CMP and, after the appointment, provide detailed documentation to demonstrate this Compliance

BREEAM Accredited Professional (AP) to monitor construction progress

- 4.20
- A BREEAM AP will regularly visit the construction site to carry out spot checks and advise the contractor and project management team on the actions to address shortcomings in BREEAM compliance. The BREEAM AP should monitor site activities with sufficient frequency to identify risks of non-compliance.
- 4.21
- In this context, visits should occur at critical stages of the construction process, when works can be observed before they are covered or when new works or trades start. To avoid missing credits due to lack of evidence or poor record-keeping, the BREEAM AP will record site visits taking photographic evidence,

delivery notes and other documentary evidence to support the BREEAM data collection process. Often, the BREEAM AP is directly employed by the main contractor or suitably qualified project team members.

Creating Employment Opportunities for local people

- 4.22 During the construction process, there are many opportunities where the contractor can create employment opportunities for developing new skills for an apprentice. Often local higher education colleges have lists of possible candidates who may benefit from the experience. To meet local employment requirements, it is recommended that the selected contractor, as part of their employment, is encouraged to take on young apprentices or administration staff who live or study within the Borough.

Dust Suppression Measures

- 4.23 Best practicable means of preventing, reducing and minimising dust will be adopted. The proposed Development is expected to adhere to the relevant Code of Practice during construction.
- 4.24 Under the Considerate Contractors Scheme, on-site reasonable practice procedures will be followed to mitigate noise, vibration, and air pollution impacts. Measures currently planned include:
- Hydraulic construction is to be used in preference to percussive techniques where practical.
 - Off-site prefabrication to be used, where practical.
 - All plant and equipment used for the works must be adequately maintained, silenced where appropriate and operated to prevent excessive noise. To be switched off when not in use and where practicable.
 - The plant will be certified to meet relevant current legislation and British Standards.
 - Loading and unloading of vehicles, dismantling of site equipment such as scaffolding, or moving equipment or materials around the site will be conducted in such a manner as to minimise noise generation.
 - Deviation from approved method statements is permitted only with prior approval from the main contractor and other relevant parties.
 - Burning of wastes or unwanted materials will not be permitted on-site.
- 4.25 As far as possible, construction works will be carried out using methods that minimise noise. In some specific cases, there is little reasonable choice other than to use percussion tools in one form or another. Quieter types of machinery will be specified for these works where possible.

Wheel Washing /Road Cleanliness

- 4.26 During the construction, the contractor will be required to provide an appropriate wheel-washing system to remove mud, stones, and any other extraneous materials from the wheels and chassis of construction vehicles exiting the site. All loads of excavation spoil or other such matter shall be fully covered.
- 4.27 The exit from the wheel washing system shall be constructed from a hard surfacing material and sited as far away from the exit to the highway as possible, given the site's constraints. The surface beyond shall always be kept clean.
- 4.28 Wastewater discharged from the wheel washing system shall be disposed of on-site and not be discharged into the public sewerage system without prior removal of soil, stones, and any other suspended material.

- 4.29 Suitable measures to minimise dust nuisance caused by the operations and to ensure that no dust or other debris is carried on to the adjoining properties shall also be provided.

Construction Vehicle Movements / Deliveries

- 4.30 Goods vehicle movements during the construction phase will be monitored closely. The management of site coordination is key to the project's success and will require a team member to control and manage the site.
- 4.31 The contractor will be expected to set up the site to provide adequate room for storing materials- i.e., masonry/stone; however, major components such as steelwork will be programmed to arrive just in time. A delivery zone will be established on-site and can hold a minimum of one HGV at any time. The proposed development scale is such that no provision of an off-site holding area for vehicles is anticipated to be required.

Public Relations / Complaints Procedures

- 4.32 The contractor's site agent will deal with all complaints and enquiries. This individual will be named at the site entrance, with a contact telephone number.
- 4.33 Any complaints will be logged on-site, thoroughly investigated and reported to the client as soon as possible. The complainant will be informed as to what action has been taken. In unusual activities or events, the client and other relevant third parties (i.e., statutory and non-statutory bodies) will be notified before the work is carried out.

Building Service Commissioning (mandatory)

- 4.34 The main contractor will employ a specialist commissioning manager who is a specialist contractor rather than a general sub-contractor, able to independently verify the work carried out by the project team members installing the systems.
- 4.35 The commissioning manager will review the design and oversee the installation and commissioning of the central building systems, including but limited to the following elements, - R32 Hybrid VRF heating cooling system, combined heat power plant, hot and cold-water services, mechanical ventilation, life safety systems, building management systems, security and access control systems, renewable energy sources, cold storage, and any other complex systems

Building Fabric Commissioning

- 4.36 It is good practice to conduct thermal bridging assessments at the design stage. This is encouraged through building regulations for energy conservation by allowing actual values in the energy calculation, which could significantly improve using the default values in the National Calculation Methodology.
- 4.37 This is reflected in Ena 01 reduction of energy use and carbon emissions, so no additional credit is offered within this issue for thermal bridging assessments. However, good thermal bridging design and assessment will contribute to successful building fabric testing results and the associated credit.

Handover and Training

- 4.38 The contractor will be required to provide a building training day before the handover and occupation of the building. The training schedules shall include the following as a minimum:

- 4.39 The building's design intent.
- 4.40 Additionally, for the building occupiers' training schedule:
 - Introduction to the non-technical building user guide for building occupiers and relevant building documentation.
 - Additionally, for the facilities managers' training schedule:
 - The available aftercare provision and aftercare team primary contacts, including any scheduled commissioning and post-occupancy evaluation.
 - Introduction to, and demonstration of installed systems and key features, particularly building management systems, controls, and interfaces.
 - Introduction to the technical building user guide for facilities managers and other relevant building documentation, e.g., design data, technical guides, maintenance strategy, operations, and maintenance (O&M) manual, commissioning records, logbook etc.
 - Maintenance requirements, including any maintenance contracts and regimes in place.

Excellent Rating

- 4.41 Extra Two Credits can be awarded if the contractor undertakes the following additional tasks:
- 4.42 Responsible Construction Management - Evaluating, planning, and implementing actions to minimise identified construction risks.
- 4.43 Construction Site Impacts - monitoring, recording, and reporting energy use, water consumption and transport data to KPI output

5

Health and Wellbeing

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Health and Wellbeing	18	12	14

- 5.1
- The category encourages building users' increased health, well-being, and safety. Issues within this category reward building design and specification decisions that create a healthy, safe, and comfortable internal and external environment.
- 5.2
- Visual Comfort provides internal daylight conditions that facilitate good visual comfort by designing the potential for glare, achieving good practice daylight factors, and having an adequate view.
- 5.3
- The building's use as a dry sports hall and leisure facility does not help to meet this requirement specified for buildings with everyday occupational use. The building layout results in some staff rest areas with window sizes that do not meet the BREEAM daylight factor requirements for occupied spaces. The sports hall has daylight from roof lights, and the requirement for a view out is not met. There is some dispensation for leisure buildings in the BREEAM Assessment. Unfortunately, the allowances are not enough to enable the daylight credits to be met.
- 5.4
- Indoor air quality is maintained using mixed-mode ventilation using a combination of mechanical ventilation in winter and natural ventilation in the summer months through high-level roof vents and low wall vents in the dry sports hall.
- 5.5
- Thermal modelling has been carried out to inform the building design to provide a comfortable thermal environment that considers current climatic conditions and projected climate change scenario conditions.
- 5.6
- Sports facilities require careful acoustic analysis to reduce sound levels and reverberation. An acoustician has been appointed to review internal and external sound levels to provide the occupants with the best practice acoustic performance levels appropriate to the functional activities in occupied spaces.
- 5.7
- The school and the local community use sports facilities. This requires additional security system access controls and CCTV to ensure the separation of School and public areas and the safety of all visitors. School security advisors have reviewed the building access routes and security points.
- 5.8
- The landscape design includes external areas that provide outdoor access for the sports staff, students, and visitors.
- 5.9
- They encourage the increased health, well-being, and safety of building users. Issues within this category reward building design and specification decisions that create a healthy, safe, and comfortable internal and external environment.

Visual Comfort

- 5.10
- Visual Comfort provides internal daylight conditions that facilitate good visual comfort by designing the potential for glare, achieving good practice daylight factors, and having an adequate outside view.
- 5.11
- There is a dilemma in using natural daylight. Sports halls require consistent even light levels without glare through windows and roof lights.

- 5.12
- All classrooms have large windows with sight lines leading to the sky view, meeting the BREEAM daylight standards.
- 5.13
- For practical reasons, the staff rest and office facilities are centrally within the building in areas where it is difficult to provide good quality natural daylight with sky views. This credit is not targeted.

Indoor Air Quality

- 5.14
- Indoor air quality is maintained using mechanical ventilation using a combination and limited natural ventilation
- 5.15
- The building will be constructed using natural materials to avoid synthetic material emitting volatile organic compounds (VOC). To meet this credit, the contractor must collect data sheets for all materials used in construction, including glues and paints. This level of detail is often challenging, and this credit is often not achieved.
- 5.16
- Indoor air quality is maintained through natural and mechanical ventilation with control of the monitor's humidity, carbon dioxide, and temperature.

Thermal Comfort

- 5.17
- Thermal modelling has been carried out to inform the building design to provide a comfortable thermal environment that considers current climatic conditions and projected climate change scenario conditions.
- 5.18
- As a sports facility, thermal comfort is built around playing sport in an enclosed environment and is a challenging task for the designers. Sports halls must provide a variety of conditions, for example:
 - Cooler temperature for playing active team sports,
 - Removal of pollutants and control of humidity,
 - Heated space for less active sports, and
 - Low air velocities for Babington, table tennis, indoor tennis and Gymnastics.
- 5.19
- Sports Halls tend to overheat in summer from heat gains through the large roof area and roof lights. A natural ventilation strategy is to be developed to enable the natural purging of heat and night cooling. The designers propose ventilation shafts, automated windows, and roof lights to provide high-and low-level openings to create air exchange without mechanical ventilation. Using a green living roof retaining rainwater helps reduce heat gain into the space below.
- 5.20
- Although Natural ventilation is the primary method, sports will require mechanical ventilation when used as an assembly hall, examination room or competition space. The air handling unit is the hall's primary heating system, as the AHU can quickly heat space and control humidity and pollutants.

BREEAM Thermal Comfort (HEA4).

- 5.21
- Thermal Comfort is 'that condition of mind which expresses satisfaction with the thermal environment. The term 'thermal comfort' describes a person's psychological state of mind and is usually referred to as whether someone is feeling too hot or too cold. Thermal Comfort is difficult to define because it needs to account for various environmental and personal factors to establish what makes people feel comfortable. Health and Safety Executive considers 80% of occupants as a reasonable limit for the minimum number of people who should be thermally comfortable in an environment. This issue aims to encourage appropriate and

robust consideration of thermal comfort issues and specification of appropriate occupant controls to ensure maximum space flexibilities and thermal Comfort for most building occupants.

5.22 The building will be zoned as below:

Zone	System	Control
Swimming pool	AHU rapid space heating, Mixed fresh Air, control of humidity, air temperature	The building system controls multiple sensors. Sports staff can make temperature adjustments from the computer in the staff office.
Changing room	AHU rapid space heating, constant fresh supply humidity, air temperature sensors. The changing rooms are to be kept under slight positive pressure, avoiding the ingress of damp air from the pool hall	The building system controls multiple sensors. Sports staff can make temperature adjustments from the computer in the staff office.
Dry Sports hall	AHU rapid space heating, Mixed fresh Air, control of humidity, air temperature. High-level windows and roof lights are fitted with automated actuators to remove summer heat.	The building system controls multiple sensors. Sports staff can make temperature adjustments from the computer in the staff office.
Dance and fitness studio	Refrigerant fan-coil units. Mechanical ventilation with heat recovery. Some high-level windows are fitted with automated window openers. Linked to temperature humidity and Carbon Dioxide Sensor	Local Space temperature control via wall-mounted controller with space reset to set point every hour. Temperature control from a computer in the staff office. Facilities managers monitor BMS.
Classrooms	Low Surface temperature radiators. Mechanical ventilation with heat recovery. Some high-level windows are fitted with automated window openers. Linked to temperature humidity and Carbon Dioxide Sensor	Local Space temperature control via wall-mounted controller with space reset to set point every hour. Temperature control from a computer in the staff office. Facilities managers monitor BMS.
Circulation spaces	Low Surface temperature radiators. Mechanical ventilation with heat recovery. Some high-level windows are fitted with automated window openers linked to temperature and humidity sensors.	Temperature control from a computer in the staff office. Facilities managers monitor BMS.
Storage area	Low Surface temperature radiators. Mechanical ventilation with heat recovery.	Temperature control from a computer in the staff office. Facilities managers monitor BMS.

Table 7 BREEAM (Hea4) Control of Thermal Comfort.

Security

5.23 The secure by design statement (accompanying planning document) outlines how security is built into the design of New School 2014 guidance documents. This credit is targeted and will further develop through the design process.

Intruder Alarm systems

5.24 Intruder alarm systems, with contact devices at all opening doors and windows, will be provided – these are to be suitably designed, fit for purpose, monitored, and comply with the ACPO Security Systems Policy requirements.

Safe Access

- 5.25 The proposed landscape around the MSC will provide paths connecting all the new primary and service entrances to the northeast of the buildings. Existing paths around the all-weather pitches will be linked to the proposal to create intuitive routes around the site.
- 5.26 A new paved courtyard will be created at the building entrance at the southern corner, with a cantilevered timber seat for waiting and an ornamental tree as a focal point, creating an informal enclosure from the street. Generous planting beds along paths and around the new building will soften the space and enhance its 'gardenesque' qualities. There will be no loose gravel in the paths, and all will be bound.
- 5.27 A paved viewing terrace above the new fives courts will be backed by a line of new trees to create shelter and frame views of the building, with planting and seating beneath. A terrace with seating in front of the fives courts has also been designed to host lower court-level viewers.
- 5.28 All "street" outdoor furniture, such as seating and bins, is appropriately situated, fixed in place, and has robust, long-lasting construction.
- 5.29 Lighting will be designed to meet movement and emergency access criteria, with a balance between good illumination and sensitivity to neighbouring residential properties and the setting of the Conservation Area, with light pollution to neighbours minimised or avoided. External lighting will be designed for paths and building perimeters associated with the landscape plan, particularly at entrances and access points. Lighting will be coordinated with CCTV installations, which are monitored by the school's in-house security team.

Meeting Spaces

- 5.30 The main entrances form the new south terrace neighbouring the new Fives Courts. The wide corridors create meeting spaces for pupils and staff. All of these are in areas that can be well controlled and supervised.
- 5.31 Although pupil access is not restricted around the other perimeter areas of the MSC, on the west, north and east, pupils are not encouraged to go in those areas without supervision by staff.

Servicing

- 5.32 The east side is essentially a service access part of the site. A new gate is provided off Broadlands for service vehicles, including maintenance, landscaping, and refuse collection by the school's vehicle to relay to the central refuse stores.
- 5.33 The new waste storage includes recycling in keeping with the school's environmental policies, all in lockable enclosures.
- 5.34 Utility meters are to be located inside plant rooms, accessed only by authorised persons.

CAR PARKING & CYCLE STORAGE

- 5.35 There is no car, moped, motorbike or vehicle parking on the MSC part of the site.

5.36 The project is providing a significant number of new cycle store spaces. Some open stands are provided at the main entrance, but most of the provision is at the north end of the site, where secure covered open stands are provided, with adjacent lighting.

6 Energy

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Energy	25	11	14

Table 8 Predicted Energy I BREEAM Credits

Energy Reduction

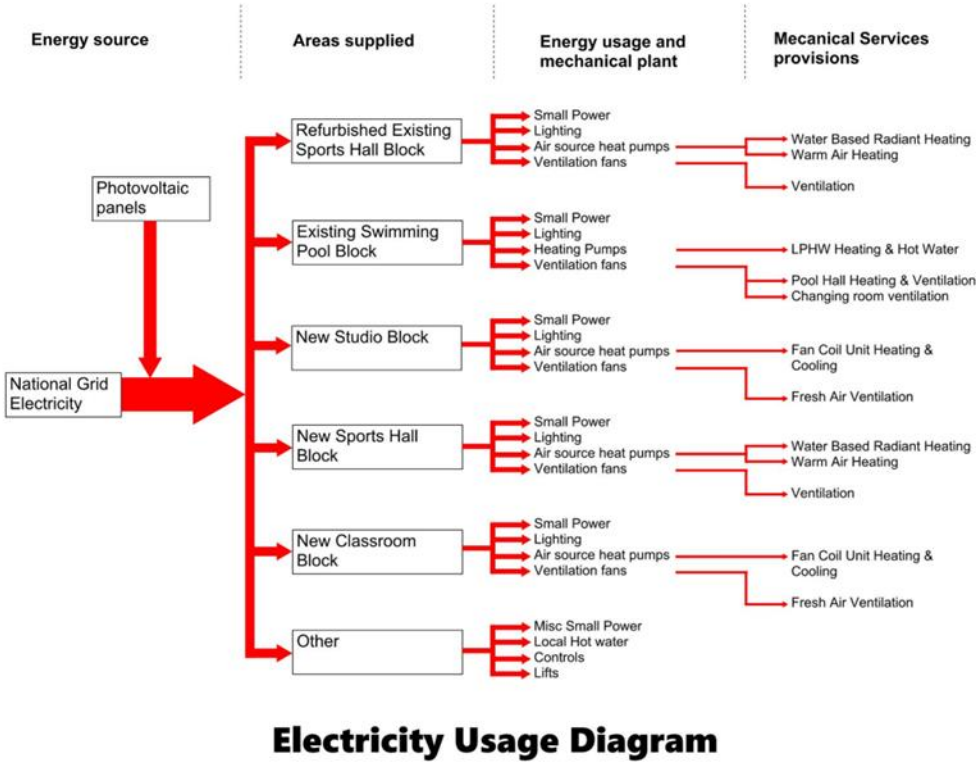
6.1 The BREEAM energy section requires reducing the building's predicted energy use and carbon emissions. The design team is initially required to consider the building's location, shape, form, and energy use at an early design stage. The design is optimised, and credits are awarded for the building design with considerably lower predicted emissions than the minimum requirement of the building regulations.

Energy Modelling (mandatory)

- 6.2 BREEAM has extended the energy efficiency modelling requirements to include accurate modelling of operational energy consumption. The predicted operational energy consumption is used to benchmark collected energy data in the first year of occupation.
- 6.3 Emissions from buildings account for 37% of total UK greenhouse gas emissions. These are made up of 45% direct emissions from burning fossil fuels for heat and 55% indirect emissions related to electricity use. Factors such as thermal insulation, air permeability, shading and glazing areas have been considered to reduce heating, cooling, and lighting demands.
- 6.4 The energy consultant will continue to develop an accurate energy model, considering factors like occupancy, weather scenarios, building services management, and any contributions from renewable and low carbon technologies. The energy modelling results will provide the background information to predict the expected energy performance and use this data by the building operator and facility management team. Compare predicted energy with actual energy usage and highlight elements where reductions can be made.

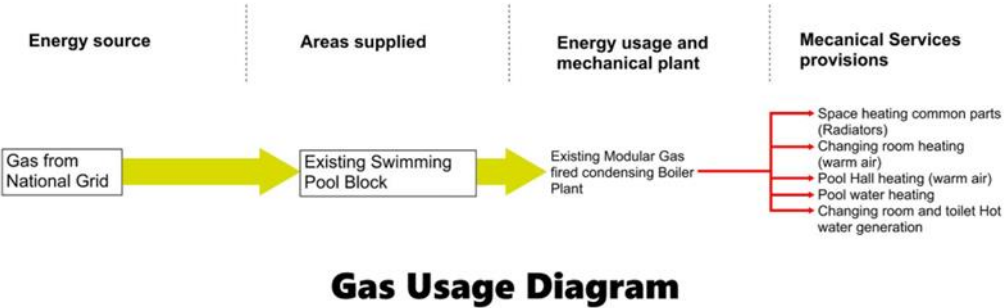
Energy Metering and Electronic monitoring of energy usage

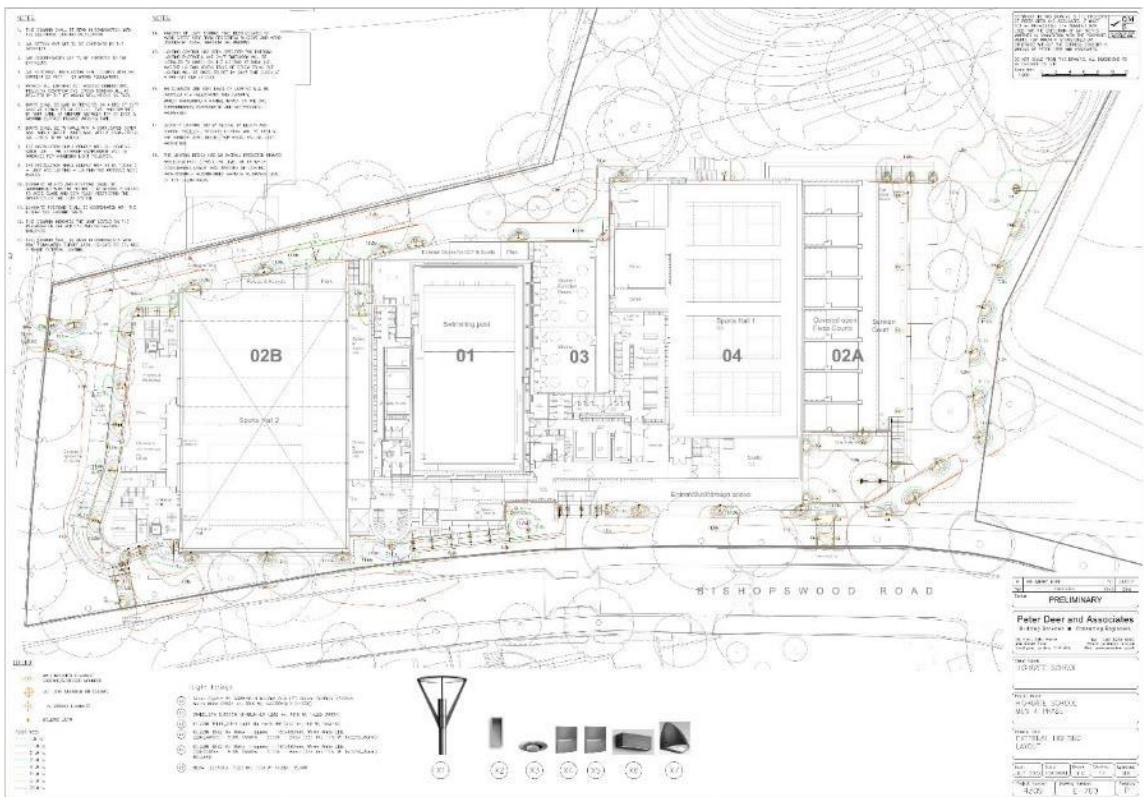
6.5 The real-time installation of energy meters with monitoring software allows the building managers to record the occupational energy demand, identify times of day with higher energy demand, and compare the data collected with the design stage energy model. The building energy manager can use the data provided to identify potential energy savings by promoting energy efficiency to the building users.



External Lighting

6.6 External lighting often operates all night without considering saving energy or reducing light pollution. As the primary purpose of external lighting is building security, the lighting designers must demonstrate an energy-efficient exterior lighting design with low pollution levels and timed external lighting controls.





Low Carbon Design

- 6.7
- The location and use of the building prohibit the use of systems such as biomass boilers (flue gasses). Various low and zero-carbon technologies and passive design options are considered part of the early design stage analysis.
- 6.8
- Various low-carbon energy and passive design options are considered as part of the early design stage analysis. The results are included in the energy report. The location and use of the building prohibit the use of systems such as biomass boilers (flue gasses) and heat pumps (external noise and low heating water temperatures).
- 6.9
- Dry sports halls and dance studios are simple, low-energy buildings that only require heating and lighting and suitable ventilation that remove pollutants without resulting in increased air velocity. This requirement restricts many passive energy options available to other types of buildings.

Energy Workshop

- 6.10
- The design team has undertaken an energy workshop that BREEAM requires at the detailed design stage to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process.

Energy Efficient Equipment

- 6.11
- The client/building operator will select only energy-efficient "A" rated appliances.

7 Transport

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Transport	11	6	6

Table 9 Predicted Transport I BREEAM Credits

Transport Assessment and Travel Plan

- 7.1 A Travel Plan is intended to promote sustainable and active travel. They aim to deliver transport and transport-related benefits to the Development and the wider community. As they include a package of actions designed to address the needs of the users in that local area, effective but unpopular solutions, such as parking restrictions, can be combined with popular but expensive solutions, such as bus subsidies, to ensure that the benefits neutralise the negative impacts.
- 7.2 The school acknowledges sustainable travel's importance by encouraging walking, cycling, and public transport. It aims to reduce the number of vehicular trips and improve the air quality and, ultimately, their staff and pupils` health. The above is achieved by a very successful Gold Level STARS Travel Plan and the ongoing commitment to keep it updated
- 7.3 The Travel Plan will be user-focused to ensure the increase and improvement of travel choices for the school members. The general aim of the travels will be to improve the local school image within Highgate, health and well-being and reduce the cost of the daily commute.
- 7.4 The project's objectives are to improve the quality of spaces for pupils, staff, and visitors. There is no intention to expand pupil numbers because of these proposals or to increase the use beyond current hours, so the number, pattern and frequency of vehicles will not change from existing levels.
- 7.5 The proposals have no impact on existing vehicle access or car parking.
- 7.6 Highgate School has created a green travel plan with the general aims of:
- Making the School a safer place to visit and work within,
 - Promoting a sustainable transport system for the pupils and staff (walking, cycling, public transport, car-sharing and electric vehicles).
- 7.7 By walking to School, the pupils and parents have quality time to engage in daily conversation.
- They are reducing the number of vehicles to help the school environment and local areas by reducing the morning 'rush hour' impact.
- 7.8 The presence of children and staff on the street helps promote 'give a good impression of the school to the local community while providing increased self-confidence for children to have discussions and improve citizen skills.
- 7.9 Highgate Village for London has relatively poor public transport connections as it is generally at the end of bus routes and has no tube station. This has resulted in the loss of almost half the transport credits. There is limited opportunity for improving transport links as assessed by the BREEAM process.
- 7.10 The school's location is over 500m from the Highgate Village shops and amenities, and these transport credits are lost.

7.11 Transport credits are achievable where the developer (School) has consulted with Haringey Council over the possible improvement of the local cycle path network and improved accessibility to the local bus stops.

Mallinson Sports Centre, Highgate School, LONDON BOROUGH OF HARINGEY by Transport Planning associates (June 2022)

Transport Statement conclusion.
The development proposals consist of the refurbishment and extension of the Mallinson Sports Centre (MSC), located on Bishopswood Road and part of Highgate School. The development will provide an additional double height Sports Hall within a partial basement, a new gym facility, two new multi-use Studios, additional staff office accommodation, a new entrance lobby and changing facilities.

The scheme is part of the school's wider programme of modernising and renewing its extensive and mixed stock of buildings and facilities to meet the educational and other demands of a 21st Century establishment. This is set out in the recently approved SPD.

The Site is in a sustainable location, accessible by walking, cycling and public transport services, in the form of local buses, school services and London Underground services. Staff and pupils access the Site either from Bishopswood Road, where controlled and uncontrolled crossings link to the Junior School or from an internal, private footpath via St Michael's Primary School, leading to the Senior School Campus.

Except for Bishopswood Road, the local highway network is part of a CPZ. No existing road safety hotspots have been identified, and the accident rates are not predicted to increase because of the proposed development.

The proposals consist of refurbishing the Site to create improved or new facilities. No staff or student numbers will increase because of the proposed development. As such, there will have no discernible impact on the local pedestrian, cycle infrastructure, on local public transport services. Cycle parking will be provided on-site. The scheme is designed to improve the street environment, with benefits for the school's users (pupils, staff, and visitors) and the whole community. It contributes to the overall aims set out in TfL's Healthy Streets approach and the MTS.

Conclusion
The development proposals are consistent with local, regional, and national planning policy, including the Highgate SPD. The proposals anticipate no adverse impact on the local highway or public transport infrastructure because there are no additional trips related to the proposed development. The proposals are instead anticipated to have a beneficial impact by creating a better and more inclusive street environment. As such, there is no reason to refuse the application on highway grounds.

Summary Of BREEAM Travel Credit

Credit	Description	Compliance	Score
Tar 01:01	Travel plan - A site-specific travel assessment & travel plan has been developed as part of the feasibility and design stages covering key travel issues & implementations.	A school-wide travel plan using TFL STARS Scheme. The school use the Gold Scheme. Students within three academic years complete 25 different travel activities, 15 supporting activities and 8 consultation activities Provide evidence for each activity completed Demonstrate at least a 6% modal shift away from the car or at least 90% of pupils travelling actively (https://stars.tfl.gov.uk/About/Accreditation)	1
Tar 02:01	Assessment option 1 - Accessibility index >8	The PTAL Rating is 1B, giving the site an accessibility Index of 5.	1

Tar 02:02	Assessment option 2 - Demonstrate an increase in the Accessibility index or provide a dedicated service	PTAL rating is already very high, and it is unlikely that the accessible index could improve to gain this credit	1
Tar 02:03	Assessment option 3 - Provide a public transport information system	The school will provide a London transport information display screen in the Entrance Hall.	1
Tar 02:04	Assessment option 4 - Provide electric recharging stations of a minimum of 3kW for >10% of the total car parking capacity	No Car parking spaces; However, the school should install car charging points in another location within the Grounds.	1
Tra 02:05	Assessment option 5 - Setup a car sharing group	The school has good public transport links and limited car parking areas. There is limited requirement for staff to commute using a car.	0
Tra 02:06	Assessment option 6 - Consult with the LA on improving the local cycling network and publicly accessible pedestrian routes.	The School should make contact with the Haringey council to work to improve public accessibility.	1
Tra 02:07	Assessment option 7 - Compliant cycle storage spaces that meet the minimum levels prescribed depending on building type	Cycle parking will be provided at the northwest of the Site, adjacent to Broadlands Road, with 42 covered cycle parking spaces provided at this location. In addition, five uncovered cycle parking spaces will be provided at the south main entrance adjacent to Bishopswood Road.	1
Tra 02:08	Assessment option 8 - Compliant cycle changing/showers/drying space that meets the minimum levels prescribed	The project's final phase is updating and modernising the existing changing rooms and studios. Building a new extension at the rear of the building will provide additional changing, storage and studio space.	1
Tra 02:09	Assessment option 9 - proximity to three existing local amenities relevant to building type	The school has access to outdoor spaces Access to a recreation or leisure facility for fitness or sports Post Box on the corner of Broadlands Rd and Bishopswood Rd.	1
Tra 02:10	Assessment option 10 - one (2 points) or more (3 points) accessible amenities are provided relevant to building type	The sports facility includes a café and is close to the dining rooms.	1



Figure 8 500m Amenity Radius.



Figure 9 Location of Post Box.

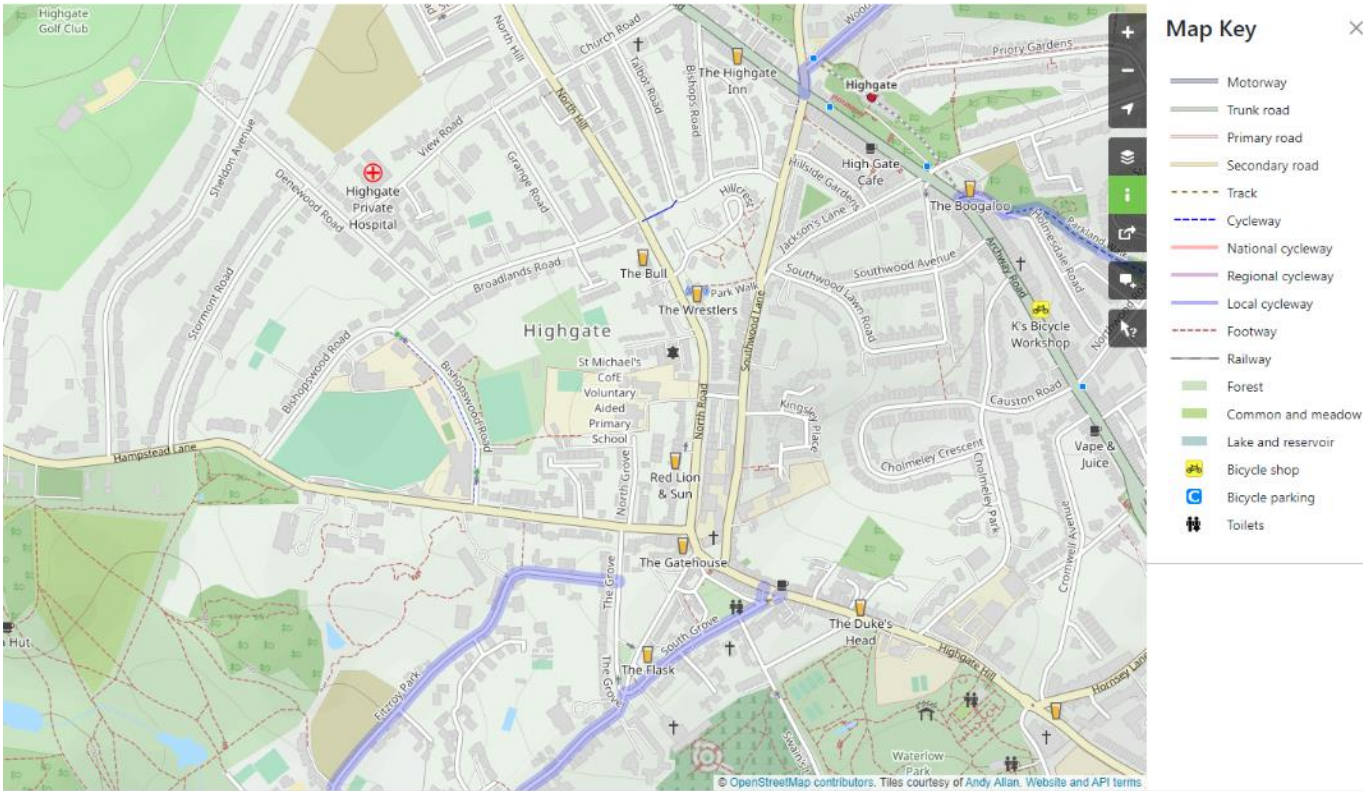


Figure 10 Cycle Routes (open street map).



Figure 12 Bus Routes (Open street Map).

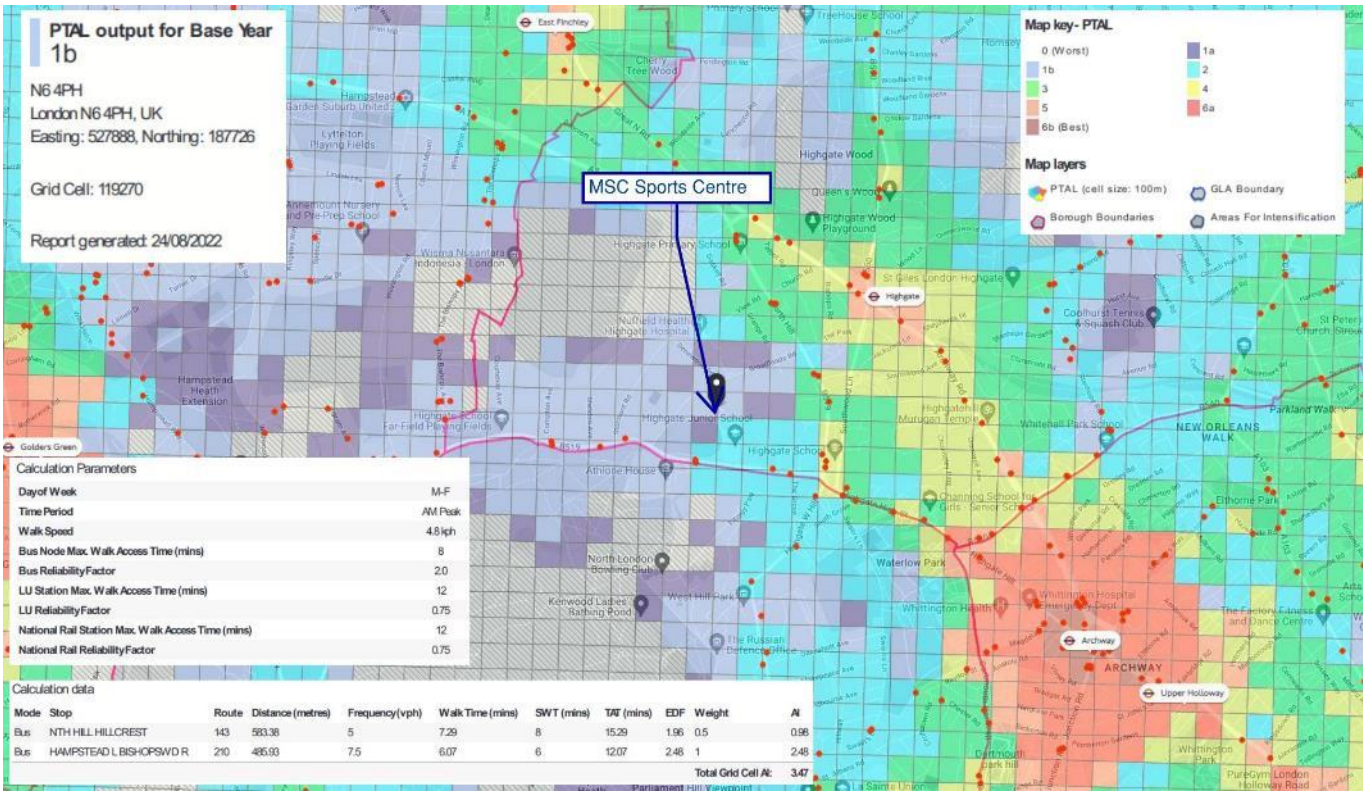


Figure 11 PTAL Rating. (TFL WebCAT).

8 Water

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Water	9	7	7

Table 10 Predicted Water BREEAM Credits

Water Efficient Equipment (Mandatory Credit)

- 8.1

In England, the average person uses about 150 litres of water daily for various uses, including sanitation, so significant savings are possible. Given that climate projections forecast half as much rainfall in summer in the Southeast of England by 2080, it is essential to build water efficiency into our building stock and minimise the need for significant infrastructure enhancements to meet these pressures and growing demands. Under these scenarios and with the expected high population growth, unless adaptation interventions are made, deficits are expected to be already widespread by the 2050s. The UK is expected to be in deficit by up to 16% of the total water demand in the 2050s and up to 29% in the 2080s leading to significant impacts on cost and resource levels.
- 8.2

The efficiency of all domestic scale water-consuming components is to be specified in line with the maximum flow rates stated below, achieving at least 2 BREEAM Credits. (25% improved over baseline water consumption for a School).

. Installation	Description	Water Use
WC	Dual Flush Cistern	5 Litres and 3 litres
Wash Hand Basin	Low Flow Regulators or Aerating Taps	3.0 Litres/Min
Shower	Low Flow Rate Between	8 litres / minute
Cleaner Sink	Standard Monoblock At 2/3 Maximum Flow rate	3.25 Litres/Min

Table 11 Water Flow Fitting

- 8.3

Water-efficient components and water recycling systems will reduce potable water consumption for sanitary use in new buildings.
- 8.4

Water meters to record both hot and cold-water usage for:
 - Changing Rooms for hot and cold usages.
 - Swimming pool water use (pool is not a part of BREEAM assessment)
 - External water used for irrigation
- 8.5

Other water management methods include:
 - All water meters will be replaced with water meters with pulsed output that is to be connected to the school Building Management system.
 - Mains cold water leak detection system is designed to alert the maintenance staff of any significant water leak in the underground mains cold supply within the school grounds.
- 8.6

Water consumption for uses not assessed under Wat 01 will be reduced by encouraging the specification of water-efficient equipment.

Water Monitoring (Mandatory Credit)

- 8.7

Sub-metering water consumption enables the accurate measuring of water uses. Large water consumers can be identified to encourage reducing water use where practical. Moreover, changes in consumption can be identified and dealt with as appropriate, thereby minimising risks of systems failures which can have costly and disruptive consequences.
- 8.8

A water meter fitted with a pulsed output is to be installed on the main water supply in the building.
- 8.9

Any water-consuming plant or building areas consuming 10% or more of the building's total water demand will be fitted with sub-meters or have water monitoring equipment integral to the plant or area. Each meter (main and sub) will have a pulsed output to enable connection to a Building Management System (BMS) to monitor water consumption.

Water leak detection

- 8.10

A leak detection system will be installed to detect a significant leak on the main water supply and between the building and the utility water meter. This system will be:
 - A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks
 - Activated when the flow of water passing through the water meter/data logger is at a flow rate above pre-set maximum for a pre-set time
 - Able to identify different flows and, therefore, leakage rates
 - Programmable to suit the owner/occupiers water consumption criteria
 - Designed to avoid false alarms caused by the regular operation of the sizeable water-consuming plant.

• **Materials**

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Materials	14	5	13

Table 12 Predicted Material BREEAM Credits

- Reducing the environmental and social impact of construction products used on a project takes a 'whole life cycle approach to construction product impacts. This encourages considering impacts during manufacture, design, procurement, installation, in-use, and end-of-life. The issue focuses on construction product efficiency, environmental impact, responsible sourcing, and product durability.
- To assist with optimising project sustainability performance, the assessment timeline outlines the stage at which credits should be addressed (see RIBA plan of Works in the appendix). Ideally, material selection should be considered by the design team at an early stage in the project, with further input from the planners, contractors, owners, occupiers, and other members of the project team to achieve the highest possible BREEAM rating at the minimum cost.
- To avoid the premature loss of BREEAM material credits, the design has already considered the life cycle of the building's superstructure and hard landscaping options. The material selection will continue to be reviewed and checked against the selection with the original design intent set out in the building superstructure life cycle analysis.

○ **Environmental Impact**

- Reducing the environmental and social impact of construction products used on a project takes a 'whole life cycle approach to construction product impacts. This encourages considering impacts during manufacture, design, procurement, installation, in-use, and end-of-life. The issue focuses on construction product efficiency, environmental impact, responsible sourcing, and product durability.

○ **Responsible Resourcing (Mandatory Credit)**

- Most construction products involve lengthy and complex supply chains that result in various impacts locally and globally. These might include environmental (e.g., toxicity or biodiversity), economic (e.g., corruption) or social (e.g., slave labour, equality) issues and can occur during the extraction, processing, manufacturing, or supply chain stages. The increasing globalisation of supply chains increases the difficulty of tracing the supply chain and mitigating adverse impacts caused by it.
- Credible certification schemes increase confidence in specifiers that risks are being minimised or avoided. Their use ensures that specifiers can demonstrate the responsible nature of their selection decisions. Examples of these are BES 6001 and ISO 14001.

- To assist with optimising project sustainability performance, the assessment timeline outlines the stage at which credits should be addressed (see RIBA plan of works in the appendix).
- The design team have already considered various material options; for example: -

- Comparing steel frame to concrete frame construction. Comparing brick with cladding systems
- Brown roofs with sustainable drainage options

○ **Durability and Resourcing**

- To avoid the premature loss of BREEAM material credits, the design has already considered the life cycle of the building's superstructure and hard landscaping options. The material selection will continue to be reviewed and checked against the selection with the original design intent set out in the building superstructure life cycle analysis.

○ **Material Efficiency**

- The proposed building materials are described within the design and access statement; however, the design intends to use buff brick, glazing/windows, and a glazed terracotta cladding panel. The team is currently reviewing these proposed materials, and further Development will be undertaken during the design development stages.
- In selecting building materials, further consideration of the end-of-life dismantling of the building and the ability to recycle the materials used is given. Brick and/or concrete frame buildings generally provide a wide variety of end uses for crushed brick and concrete than buildings using more exotic panel systems.
- Green Guide Rating of typical construction
- Below is an example of possible green guide ratings of potential building materials:
- Brickwork outer leaf, insulation, cellular dense blockwork inner leaf, cement: lime mortar, plasterboard on battens, paint -green guide rating "A+."
- Stone Wool insulation 128kg/m³ - Green Guide rating" A."

- *Flat Roof In situ reinforced concrete slab with 50% GGBS and 20% recycled coarse aggregate, vapour control layer, insulation*

• Waste

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Waste	10	6	8

Table 13 Predicted Waste BREEAM Credits

- As waste treatment and disposal have both positive and negative impacts on the environment and climate, Haringey is focusing on reducing waste, in line with the waste management hierarchy, which is to:
 - Reduce - Construction and operation of School Sports facilities,
 - Reuse - Review the recyclability of selected construction materials,
 - Recycle waste. - Provision of waste recycling facilities during construction and end-of-life dismantling.
 - Haringey is committed to sustainable waste management through prioritising waste reduction, reuse, and recycling, as reflected in the Sustainable Community Strategy and the Greenest Borough Strategy. The Borough is also implementing this waste management strategy to meet its waste apportionment figure, which is set out in the London Plan Policy SP6 Waste and Recycling Construction Waste - To divert construction waste from landfills by following the waste management hierarchy
- Reducing Construction Waste:
- There is a commitment to reducing waste at the source, which requires that the main contractor implements waste prevention and reduction measures within all areas of their responsibility to address the requirements under the BREEAM Assessment.
 - A Site Waste Management Plan (SWMP) will be implemented for the construction site in-line with the BREEAM (2018) requirements during construction. More than 85% of the waste is targeted to be diverted from landfills.
 - The waste produced during construction will be segregated and stored separately. The segregation of the materials as a minimum will include paper, glass, plastic, cardboard, metal, and other construction waste. Every effort will be made to reuse these materials on-site before sending them to recycling facilities or landfills. Materials will be locally and/or responsibly sourced, with all timber being legally sourced and certified via one of the BREEAM 2018-compliant certification schemes, e.g., FSC, CSA.
 - Domestic and Operational Waste - Provision of adequate refuse and recycling storage space, allowing ease of collection in all developments to reduce domestic waste/operational waste.
- Designing Out Waste
- There are five fundamental principles that design teams can use during the design process to reduce waste: -
 - Design for Reuse and Recovery.
 - Design for Off-Site Construction.

- Design for Materials Optimisation.
- Design for Waste Efficient Procurement; and

○ Design for Deconstruction and Flexibility

- Throughout the design process, consideration will be given to the quality of materials to be specified and the quantities. Wherever possible, these will be reduced by specifying appropriate materials. Extra consideration is given to building material selection, which maximises the life expectancy of the building by selecting materials build-ups from the Green Guide to specification.

○ Reducing Domestic and Operational Waste:

- The proposed Development will combine internal storage space with an external local authority collection scheme. A dedicated external and internal storage space for the Development's operational-related recyclable waste streams will be provided so that such waste is diverted from landfills or incineration. Bins will be stored in a dedicated waste storage area at ground level, accommodate all the required waste streams prescribed by the Borough for collection, and be clearly labelled, for example, recyclable, general waste, food waste, garden waste etc. The requirement for reducing domestic and operational waste is met by meeting the BREEAM 2018 New Construction criteria.

○ Adaptation to Climate Change

- The design team should consider the risks of climate change on the selected building material and various systems. This is to avoid costly alteration and modification to the proposed building because of predictable climate changes such as hotter, drier summers and colder, wetter winters with a higher probability of extreme weather conditions.
- The design team will undertake a systematic, structured approach to identify, evaluate, and manage the risk presented by climate change. The Climate Change risk assessment will include the following elements:

○ Identifying the hazards

- Eliminating the hazards as far as reasonably practicable.
- Reducing the risks from each hazard as far as reasonably practicable.
- The risk assessment will help identify elements that may have reduced life expectancy or require increased capacity because of climate change. The risk assessment will identify how the designers have allowed increased space, facilitated replacements, or selected alternative products.

• Land Use and Ecology

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Land Use and Ecology	13	6	10

Table 14 Predicted Land use and Ecology BREEAM Credits.

- Biodiversity, the richness, and the variety of nature are essential to preserving a healthy environment. Its decline reduces the pool of biological resources available to future generations. The London Borough of Haringey supports the conservation and enhancement of biodiversity as part of its broad approach to sustainable Development and growth in the Borough and through the operation of the development control system.
- The site is located on the school campus. The building is in a landscaped environment with mature trees (see Arboriculture Report 2009), many of which are to be retained. The School already has policies to promote suitable landscaping design that promotes biodiversity and encourages local wildlife.

○ Applied Ecology – Ecology Report (April 2022)

- In April 2022, Applied Ecology Ltd was commissioned to conduct a Preliminary Ecological Appraisal (PEA) AEL was also commissioned to complete Biodiversity Net Gain (Defra Metric 3.1) and BREEAM assessments (BREEAM 2018 LE02–LE05) of the proposed Development, as well as to produce a Landscape Ecological Management Plan for the scheme.
- The Ecology Report presents the findings of ecological appraisal in Chapter 2 and highlights any significant ecological constraints and opportunities relating to the proposed developments. It provides a Biodiversity Net Gain assessment in Chapter 3, a BREEAM assessment in Chapter 4, and Chapter 5 provides the LEMP for Development. Land associated with works associated with Highgate School Mallinson Sports Centre.

○ LE 01 Site Selection

▪ Previously occupied land (1 credit)

- Only approximately 50% of the site qualifies as previously developed land as defined by BREEAM; as such, the site does not qualify for this credit. The relevant definition of previously developed land excludes: *"land in built-up areas such as parks, recreation grounds and allotments which, although they may feature paths, pavilions and other buildings, have not been previously occupied."* The playing fields, amenity areas, and woodland do not infer the definition of previously developed land.

▪ Contaminated land

- The site does not constitute contaminated land; therefore, the scheme does not qualify for this credit.

○ LE 02 Identifying and Understanding the Risks and Opportunities for the Project

▪ Survey and evaluation (1 credit)

- Robert Hutchinson MCIEEM, an SQE, has verified the findings and conclusions of this report. The information from the PEA has been used to inform mitigation requirements and biodiversity enhancements. In addition to the PEA reported in Chapter 2, AEL has previously completed PEAs of the Site in 2015 and 2019, providing ongoing ecological advice throughout the design process.
- The PEA report summarised the relevant baseline ecological data for the site and identified its key ecological features (primarily the woodland block and associated mature trees and hedges). It outlined the likely risks of Development and put forward relevant mitigation measures to reduce/remove these risks. Ecological enhancements have been considered throughout the process via a Biodiversity Net Gain assessment which has informed the Development and landscaping design.
- Survey and evaluation data, including preliminary biodiversity net gain assessments, have been shared with project team members, and these have been used to inform the production of the landscape design proposal, including the enhancement of retained woodland, native wildflower planting and green roofs.
- As all three criteria have been met, one credit can be awarded

▪ Determining ecological outcomes (1 credit)

- Formal Consultation with relevant ecological stakeholders (such as local government and NGOs such as the Wildlife Trusts and the Bat Conservation Trust) is considered necessary under BREEAM 2018 only for large projects or that may impact sensitive areas. Smaller-scale projects are not required to formally engage with these organisations if they incorporate decisions which comply with or exceed local and national policy on biodiversity.
- The Development meets and exceeds relevant national policy regarding its impacts on ecology. For example, the Development will result in a net gain for biodiversity, which relevant national policy (the NPPF) states should be a Development requirement. Chapter 3 of the Ecology Report details the Biodiversity Net Gain assessment.
- The mitigation hierarchy has been followed throughout the project design and mitigation process.
- Because both criteria have been met, one credit can be awarded.

▪ Exemplary level criteria – broader site sustainability (1 exemplary credit)

- "Wider sustainability-related activities and potential ecosystem service benefits (see Definitions) are considered as part of determining the optimal ecological outcomes for the site (criterion 7), including the areas outlined in the Methodology."

- The ecosystem services benefits of the habitats on site (e.g., providing habitat for pollinators and providing recreation and amenity value for the School) have been considered throughout the design process.

Criterion 10

- "10. a: Hea 07 Safe and healthy surroundings – Both credits
- 10.b: Pol 03 Flood and surface water management – Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution.'
- 10.c: Pol 05 Reduction of noise pollution."
 - It is not known at this stage if the scheme will achieve these credits, and as such, this credit is not currently available.

○ LE 03 Managing Negative Impacts on Ecology

▪ *Planning and measures on-site (1 credit)*

- Potential negative ecological impacts were identified during the initial PEA survey, which identified the potential of trees, hedges, and woodland to support nesting birds, as well as the biodiversity value of these habitats and their function as part of the wider ecological network. Subsequently, the retention and protection, where possible, of these habitats and enhancement through improved management and supplementary tree planting were adopted as part of the landscape design.
- Following the PEA, the recommendations for the protection of potential bird nesting habitats during the breeding season and minimising after-dark lighting will be adopted during Site preparation and construction
- The mitigation strategy is completed based on data collected from the initial surveys and follows the mitigation hierarchy. Due to the scale of the Development, ecological stakeholders do not need to be formally consulted if decisions comply with or exceed recommendations provided by the local or national policy or guidance produced by conservation NGOs.
- As all three criteria have been met and one credit can be awarded

▪ *Managing negative impacts (up to 2 credits)*

- Potential impacts on nesting birds will be avoided by following the timing recommendations made in the PEA report, and no overall loss of the ecological value of the habitats on site has occurred (see LE04 section).
- As a result, one credit can be awarded.

○ LE 04 Change and Enhancement of Ecological Value

▪ *Ecological enhancement (1 credit)*

- Measures to enhance the ecological value of the site have been implemented. See the section on biodiversity net gain assessment in Chapter 3.

- No relevant data were provided to the local environmental records centre as part of the PEA due to the limited ecological value of the habitats at the site and the lack of protected species surveys.
- The relevant criteria have been met, and one credit can be awarded.

▪ *Change and enhancement of ecology (up to 3 credits)*

- The change in ecological Development on the site because of Development has been calculated using Defra Metric 3.1 as detailed in Chapter 3, rather than using the GN36 method.
- The calculation shows a post-intervention gain of +18.74% and, therefore, a post-development area-based biodiversity unit value of 118.74% of the pre-development baseline. It, therefore, achieves three credits for achieving a net gain for the habitats assessed.

▪ *Exemplary level criteria (one credit)*

- Criterion 7 - "The change in the ecological value calculated under criterion 6 above confirms significant net gain has been achieved as set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2."
- The scheme achieves one credit for achieving a significant net gain (a post-development value of over 110%).

○ LE 05 Long Term Ecology Management and Maintenance

▪ *Management and maintenance throughout the project (1 credit)*

- The Applied Ecology report has prescribed measures to monitor and review the effectiveness of mitigation, and enhancement measures are provided in the Landscape Ecological Management Plan in Chapter 5 of this report. One credit is therefore awarded.

▪ *Landscape and Ecology Management Plan (1 credit)*

- The Landscape Ecological Management Plan is provided in Chapter 5 of this report. One credit can be awarded.

○ Summary

- A summary of the BREEAM assessment for LE02–LE05 is provided in the table below. The table indicates the credits available to the current scheme for each subsection of LE02–LE 05, providing all necessary conditions continue to be met.
- A total of 12 credits can be awarded at this stage, with a possible additional credit available depending on meeting the exemplary credit conditions for LE 02.

Credit	Criteria	Total Available Credits	Credits achieved	Potential additional credits achievable
LE 01 Site selection	Previously Occupied Land	1	0	
	Contaminated land	1	0	
LE 02 Identifying and understanding the risks and opportunities for the project	Survey and evaluation	1	1	
	Determining the ecological value of the site	1	1	
	Exemplary level criteria	1	0	1
LE 03 Managing negative impacts on ecology	Planning, liaison, implementation, and data	1	1	
	Managing negative impacts of the project	2	2	
LE 04 Change and enhancement of ecological value	Ecological enhancement	1	1	
	Change and enhancement of ecology	3	3	
	Exemplary level criteria	1	1	
LE 05 Long-term ecology management and maintenance	Planning, liaison, data, monitoring and review management and maintenance	1	1	
	Landscape and ecology management plan (or similar) development	1	1	
Total available credits 13 plus 2 exemplary credits			12	1

Table 15 Summary of BREEAM Ecology Credits.

• Pollution

	Available Credits	Expected Targeted Credits	Targeted for Excellent
Pollution	12	9	11

Table 16 Predicted Pollution BREEAM Credits

- Flooding: Global warming is predicted to cause significant changes to the world's climate. Some causes may include more frequent, short-duration, high-intensity rainfall or more frequent periods of long-duration, sustained rain. According to the environmental agency, over 5 million people live or work in England or Wales in flood-risk areas.
- There is a requirement under Policy SI 12 Flood Risk Management (London Plan 2021) and LBH Policy SP5 Water Management and Flooding that all new development proposals must comply with a flood risk assessment as set out in PPS25. To address the issue of flooding, the London Borough of Haringey has carried out a strategic flood risk assessment (SFRA), where the risk of flooding was assessed in different areas of the Borough. The requirement to carry out a flood risk assessment is a requirement under the BREEAM 2011 Assessment

○ Impacts of Refrigerants

- The proposed heating and cooling system will consist of "R32 Hybrid VRF" air source heat pumps. The system utilises the low GWP (657) refrigerant R32, providing a real solution that delivers high operational efficiency whilst minimising the global warming potential of the refrigerants used within these systems. R32 refrigerant is an essential step towards a zero ODP, zero GWP, and efficient, safe, and non-toxic refrigerant.
- R32 is above the BREEAM Credit threshold, and this credit is not achieved. Currently, there are no available refrigerant cycle heat pumps that meet the credit requirements.
- Refrigerant Leak Detection
- The R32 Hybrid VRF is designed with refrigerant leak detection and pumps down the system. These systems help safeguard against refrigerant levels exceeding permitted concentration levels and react effectively in the event of leaks.
- The building will be designed where feasible to avoid/reduce the specification of refrigerant cooling within installed systems. A refrigerant charge of 6kg will be set as the upper limit.
- All systems (with electric compressors) will comply with BS EN 378:2008 (parts 2 and 3), and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice2.

○ Local Air Quality

- Haringey (as is all of central London) is within an Air Quality Management Area (AQMA) as currently within national air quality objectives.

- EU Annual Mean Limit Values

- NO₂ is less than 20 µg/m³ passing the EU limit of 40 µg/m³
- PM10 is less than 17 µg/m³ passing the EU limit of 40 µg/m³
- PM2.5 is less than 12.5 µg/m³ passing the EU limit of 25 µg/m³

- World Health Organisation (WHO) Annual Mean Limit Values

- NO₂ is less than 20 µg/m³ passing the WHO limit of 40 µg/m³
- PM10 is less than 17 µg/m³ exceeding the WHO limit of 20 µg/m³
- PM2.5 is less than 12.5 µg/m³ exceeding the WHO limit of 10 µg/m³

- The Local air quality credit is achieved as the combined heat power (CHP) system proposed for this project has a NO_x emission rate of 20mg/kWh, below the target set for two credits to be awarded. CHP machines are internal combustion engines that operate at a higher combustion temperature than a boiler with resulting NO_x levels.

○ Flood and Surface Water management

- Eden Vale Young is appointed to provide the Highgate School Flood Risk assessment of the Mallinson Sports Centre. Pringuer James Consulting Engineer (PJCE) is appointed to develop the sustainable drainage proposal as described within the "Highgate School, Mallinson Sports Centre 4-Phase Scheme SuDS Strategy" (May 2022).

▪ Site

- The site is defined as a Brownfield site because it is currently occupied by existing buildings to be demolished or refurbished as part of the phase development.
- The potential for sustainable drainage design is limited by working with and around buildings and infrastructure.
- The site is located above deep glacial clay (at least 50m deep), and if tested, the soil will have a poor infiltration rate, requiring an extensive surface area and storage to contain surface water on site.
- The Pringuer James consulting Engineer (PJCE) has developed the sustainable drainage Proposal as described within the "Highgate School, Mallinson Sports Centre 4-Phase Scheme SuDS Strategy" (May 2022).

▪ Flood Resilience

- A specific flood risk assessment by Eden Vale Young confirms the Development is of low flood risk from all potential sources of surface water flooding, including drains, culverts, sewers, and groundwater. It is in a flood zone, defined as having a low annual probability of flooding.

Summary of flood risk from various sources

The impact of surface water flooding will govern the Development as it poses the highest risk to the site.

The risk from other sources of flooding reviewed in this chapter is considered low.

Table 17 Paragraph 3.9 Eden Vale Young High gate School Flood Risk Assessment. (2022).

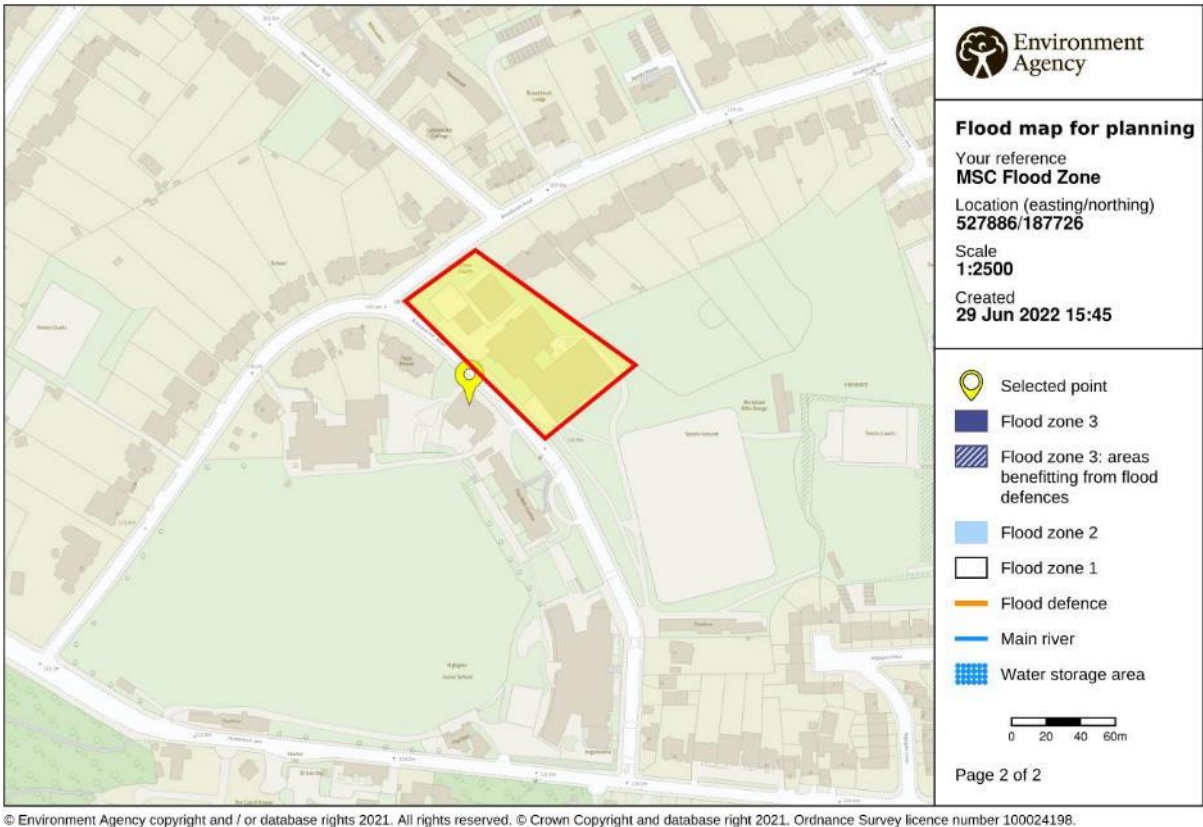


Figure 13 Environment Agency Flood Map for Planning.

Impermeable surfaces

Site Area	13,992m ²	Brownfield Site
	Pre-Development	Post Development
Impermeable area	2,185m ²	3,846m ²

Table 18 Site pre- and post-development impermeable area

- As a result of an increase in land-use efficiency, there has been a consequential loss of permeable surfaces (1600m²). The designers have made the building flood resilient by locating all entrances above possible extreme flood levels.
- Viability of Standard SUD techniques**
 - The BREEAM assessment requires a bespoke surface water run-off design solution considering the specific site requirements and natural or manufactured environment of and surrounding the site. The design follows SuD's hierarchy with justification for the design proposal.
 - PJCE consultant Engineers have developed the sustainable drainage strategy following the sustainable drainage hierarchy and Haringey's planning guidance.
 - The SuDS strategy addressed 3 components required under local and national planning guidance:

- Sustainable Urban Drainage Systems (SuDS) components to be implemented
- Method of controlling discharge rate
- Method of controlling discharge volume

Methods for controlling stormwater:

- Storing water for later use** is not an option due to the size of the building occupying most of the site. It is impractical for health safety to use rainwater internally within the building. The used water for irrigation is possible; however, the playfields are only water for short during hot weather when the storage would naturally be low. At present, it is not a cost-effective solution to reuse stored rainwater.
- Infiltration-** the clay soil with low infiltration requires an extensive area for infiltration beds. There is no space around the buildings.
- Attenuate rainwater in ponds or open water features for gradual release** – space limitation restricts the use of such features. The PJCE SuD proposal includes a natural swale created by Broadlands Road height above natural ground level. Under extreme rainfall conditions, water is collected and controllable drain from this location.
- Attenuate rainwater by storing it in tanks or sealed water features for gradual release** - a brown roof with rainwater storage capability is proposed for the sports hall. The brown Roof will reduce the water flow rates from the Roof under average rain conditions.

Surface water Run-off Rate (Credit One)

- For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site for a 1-year and 100-year return period events.

	Pre-Development	Post Development	Improvement
Peak Run-off rate 1-year return	13.79l/s	3.22 l/s	76% reduction
Peak Run-off rate 100-year return	52.40l/s	12.10l/s	76% reduction

Table 19 Peak Surface Water Run Off Rate Pre & Post Development.

- Delivering as close to greenfield run-off rate during higher intensity and more critical rainfall events. The surface water flow is predicted to be 76% of the pre-developed flow rate. The Suds proposal is to limit the surface water flow rates to 8.0l/s up to 1-in-30-year storm and increase this to 12.0l/s for rainfall up to 1-in-100year +40% Climate Change. Attenuation structures are proposed for capturing and storing stormwater, up to 1-in-100year +40% Climate Change event.
- The School will be responsible for the ownership and maintenance of the suds. An outline maintenance plan is described in appendix F of PJCE Highgate School, Mallinson Sports Centre 4-Phase Scheme SuDS Strategy" (May 2022).

○ Surface Water Run-off Volume

- Flooding of the property will not occur in the event of local drainage system failure (caused by extreme rainfall or a lack of maintenance).
- In the event of a surface exceedance event or block of surface water drains, the floods are directed away from the building into the lower part of the site, as outlined below. The entrance to the building is approximately 1m above the pre-developed ground level. Flood water will cross over Broadlands Road

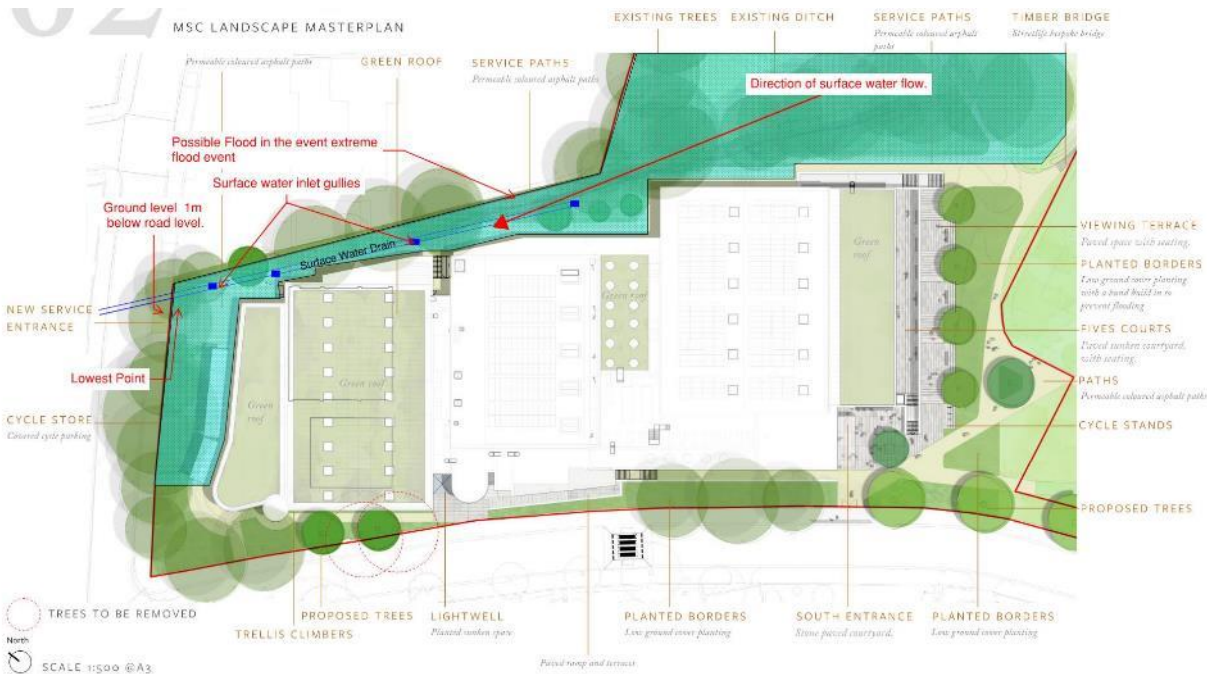


Figure 14 Possible flood zone in the event of surface water drainage failure.

- PJCE Sud proposal is given limited external space and no infiltration. The only viable means of storing surface water is via attenuation tanks within the site boundary, which would be located around the proposed buildings.
- PJCE is also examining alternative arrangements to store attenuation volume behind the new dam and within the Orchard Sports Ground flood zone (refer to Flood Risk Assessment to better understand the facility's function), which is being constructed to protect the Development from flooding.
- To Achieve a Greenfield run-off rate from the refurbished building and new extension requires rainwater Attenuation tanks around buildings or storage behind the dam and a hydro-brake within the Thames Water Sewer.
- In a Preliminary discussion Thames Water has outlined several practical, technical, and legal challenges that require addressing to enable this solution. Further survey work and discussion with Thames water are required after planning to determine the location of the hydro-brake.

■ Run-off Volume

- Flooding of the building will not occur. The excessive flood water is to be contained d within the natural valley located along the northern boundary and dammed by the site off Broadlands Road
- The drainage design run-off rate for the 100-year 6-hour event, including an allowance for climate change, is less than the predeveloped run-off rate (see Figure below)

	Existing Site	Greenfield Volume	Unmitigated Volume (No SuDS, no flow control)	Mitigated Volume (With SuDS and flow control set at 8.0l/s and 12.0 l/s)
1-in-1	93.70	69.60	118.90	114.39
1-in-30	261.90	188.40	338.50	172.80
1-in-100	363.00	261.40	469.10	259.20
1-in-100 + 40% CC	-	-	653.30	259.20

Table 6 - Volume comparison summary

Figure 15 Volume flow rates (PJCE May 2022).

■ Minimising watercourse pollution

- PJCE will design the surface water attenuation to retain a water volume equivalent to 5mm rainfall across the site.
- The site has a low pollution risk as there are no industrial processes or vehicle parking. The most significant danger is from swimming pool water treatment chemicals. The chemicals are safely stored in the pool water treatment plantroom. The quantity of stored chemicals is limited by the barrel size, which can easily be manhandled. Limiting the quantity of stored water treatment chemicals reduces pollution.

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Appendix A. BREEAM Pre Assessment Tables

Peter Deer and Associates Sustainability ■ Environmental Consultancy											
Highgate School Mallison Sports Centre				BREEAM Pre Assessment				Report Table			
		Available Credits		Expected Targeted Credits	Targeted for Excellent						
Management		21		13	16						
				Unclassified 0%	Excellent 74.58%						
Credit	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Man 01 Project brief and design	To optimise final building design through recognising and encouraging an integrated design process and robust stakeholder engagement.	Man 01:01	Project Delivery Planning - the project delivery stakeholders have met to define roles & responsibilities and contributions inc a Project Execution Plan	Meeting minutes & Project Execution Plan setting out the process and scope of the consultation	Stephn Freeth / HGS	Appointments need to be in place from RIBA Stage 1 onwards - Design Team to confirm if information currently exists		1	1	1	BREEAM Link Man01
		Man 01:02	Third Party Stakeholder Consultation - stakeholder consultation & contributions have demonstrated influence on the Project Brief / Concept Design.	Meeting minutes & Consultation plan setting out the process and scope of the consultation & influence on the design	Stephn Freeth / HGS			1	1	1	
		Man 01:03	BREEAM AP (Concept Design) - Appointed to facilitate the setting of contractual BREEAM performance target(s) for the project	Appointment letter / meeting minutes / progress reports	Stephn Freeth / HGS	BREEAM Assessor	RIBA 2	1	1	1	
		Man 01:04	BREEAM AP (Developed Design) - Appointed to facilitate the achievement of contractual BREEAM performance target(s) for the project.	Appointment letter / meeting minutes / progress reports	Stephn Freeth / HGS	BREEAM Assessor	RIBA 3	1	1	1	
Man 02 Life cycle cost and service life planning	To promote the business case for sustainable buildings and to deliver whole life value by encouraging the use of life cycle costing to improve design, specification, through-life maintenance and operation.	Man 02:01	Elemental Life Cycle Cost (LCC) - design option appraisals as 'Standardised method of life cycle costing for construction procurement' PD 15696S 2008	Elemental life cycle cost plan	Stephn Freeth / HGS	Costly and need to be in place from RIBA Stage 2 onwards	RIBA 2	1	NS	0	BREEAM Link Man02
		Man 02:02	Component Level LCC Plan - Envelope / Services / Finishes / Spaces & influence on minimising life cycle costs and maximise critical value	As above + Component level	Stephn Freeth / HGS	Costly and need to be in place from RIBA Stage 2 onwards	RIBA 4	1	NS	0	
		Man 02:03	Capital Cost Reporting - Report the capital cost for the building in pounds per square metre (£/m2	A above + Capital cost reporting	Erle Dwyer - Gardiner & Theobald LLP	Credit targeted – no capital cost		1	1	1	
Man 03 Responsible construction practices	To recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner.	Pre Requisite	All timber and timber based products used on the project is 'legally harvested and traded timber' (see Relevant definitions).	Contract / specification / confirmation letter	Contractor - to be appointed.	Standard implementation					BREEAM Link Man03
		Man 03:01	Environmental management - The principal contractor operates an environmental management system (EMS) in accordance with SO14001	Contract /Specification/confirmation letter	Contractor - to be appointed.	Contractor ISO 14001		1	1	1	
		Man 03:02	Sustainability Champion Construction (BREEAM AP) - Appointed to monitor site based activities for the construction period.	Appointment letter / meeting minutes / progress reports & site logs	Contractor - to be appointed.	AP to be appointed by Contractor		1	1	1	
		Man 03:03	Responsible Construction Management - Evaluating, planning and implementing actions to minimising identified construction risks.	Specification / confirmation letter / reports	Contractor - to be appointed.	See table 4.1 of BREEAM Technical Manual		2	1	2	
		Man 03:04	Construction Site Impacts - monitoring, recording and reporting energy use, water consumption and transport data to KPI output	Contract / specification / confirmation letter / KPI reports	Contractor - to be appointed.	Standard implementation		2	1	2	
Man 04 Commissioning and handover	To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants	Man 04:01	Commissioning (Pre Completion) -Independent monitor, schedule and programme of pre-commissioning, commissioning, testing, recommissioning etc	Appointment Letter(s) / commissioning responsibilities / schedule	Contractor - to be appointed.	Independent Commissioning considered implementation		1	1	1	BREEAM Link Man04
		Man 04:02	Commissioning (Design and Preparation) - complex building services and systems are commissioned under specialist commissioning manager & process	Appointment Letter(s) / commissioning responsibilities / schedule	Contractor - to be appointed.	Independent Commissioning considered implementation		1	0	0	
		Man 04:03	Testing and Inspecting Building Fabric - demonstrated through the completion of a thermographic survey, airtightness test and insulation integrity inspection	Appointment Letter(s) / commissioning responsibilities / schedule	Contractor - to be appointed.	Survey reflecting quality and efficiency		1	0	0	
		Man 04:04	Handover - Two Building User Guides (Non-technical & Technical user) and two Training Schedules are developed prior to handover for distribution to the building occupiers and premises managers	Appointment Letter(s) / commissioning responsibilities	Contractor - to be appointed.	Survey reflecting quality and efficiency		1	1	1	
Man 05 Aftercare	To ensure the building operates in accordance with the design intent and operational demands, through providing aftercare to the building owner and occupants during the first year of occupation	Man 05:01	Aftercare Support - operational infrastructure and resources in place to provide aftercare support to the building occupier(s) at handover & longer term	Contract / specification / confirmation letter	Contractor - to be appointed.	BUG & Training considered standard implementation		1	1	1	BREEAM Link Man05
		Man 05:02	Commissioning (Implementation) -various commissioning activities to be completed over a minimum 12-month period, once the building becomes substantially occupied, inc seasonal commissioning	Contract / specification / confirmation letter	Contractor - to be appointed.	Quasi-soft landings & post-handover Commissioning considered low cost implementation		1	1	1	
		Man 05:03	Post Occupancy Evaluation - a commitment to carry out a post occupancy evaluation (POE) exercise one year after initial building occupation	Contract / specification / confirmation letter	Highgate School sport team			1	NS	1	
Total								21	13	16	

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Wellbeing	18		12	14
			Unclassified 0%	Excellent 74.58%

Health and Wellbeing	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Head 01 Visual comfort	To encourage best practice in visual performance and comfort by ensuring daylighting, artificial lighting and occupant controls are considered.	Hea 01:01	Glare control - potential for disabling glare has been designed out of all relevant building areas using a glare control strategy,	Design drawings / specifications / window schedule	Ed Toovey - Ed Toovey - Architecture	Blinds typically installed for compliance		1	1	1	BREEAM Link Head 01
		Hea 01:02	Daylighting - relevant building areas meet good practice daylight factor(s) and other relevant criterion	Daylighting calculations	M&E /lighting Designers	Internal daylight report		2	0	0	
		Hea 01:03	View Out - 95% of the floor area in relevant building areas is within 8m of a wall which has a	Design drawings / specifications / window schedule	Ed Toovey - Architecture	Standard implementation		1	0	0	
		Hea 01:04	Internal /External Lighting - Lighting in all relevant areas of the building is designed to relevant CIBSE / BS guidelines and fitted with high frequency ballast	Design drawings / specifications / room data sheets	M&E /lighting Designers	Standard implementation		1	1	1	
Hea 02 Indoor air quality	To encourage and support healthy internal environments with good indoor air quality.	Hea 02:01	Indoor Air Quality (IAQ) Plan - An indoor air quality plan is produced, with actions that minimise indoor air pollution during occupation of the building	Copy of indoor air quality plan / specification / design drawings	PDA - M&E Engineers	Clear strategy & plan for good quality air level		1	1	1	BREEAM Link Head 02
		Hea 02:02	Air Quality (Ventilation) - minimising the concentration and recirculation of pollutants in the building -inc intake/extracts, CO2 sensors, HVAC filters	Air Quality Plan / Specification / design drawings	PDA - M&E Engineers	Located within 10m of source of external pollution		1	0	1	
		Hea 02:03	Air Quality (VOC's) - All decorative paints and varnishes as well as other key finishes elements meet the relevant VOC criteria	Specification	PDA - M&E Engineers	Products to be reviewed for VOC content		2	2	2	
Hea 04 Thermal comfort	To ensure the building is capable of providing an appropriate level of thermal comfort.	Hea 04:01	Thermal Modelling - Full dynamic thermal analysis carried out in accordance with CIBSE AM11. Temperature ranges are in accordance with CIBSE Guide A.	Thermal modelling report /specification	PDA - M&E Engineers	Overheating report to be undertaken and building designed not to be at risk of overheating - allowance for climate change to be investigated		1	1	1	BREEAM Link Head 04
		Hea 04:02	Adaptability (Climate Change) -Thermal modelling demonstrates requirements are achieved for a projected climate change environment	Thermal modelling report /specification	PDA - M&E Engineers			1	1	1	
		Hea 04:03	Thermal Zoning & Controls - Thermal modelling analysis has informed the temperature control strategy for the building and its users	Thermal comfort strategy and zoning summary	PDA - M&E Engineers			1	1	1	
Hea 05 Acoustic performance	To ensure the building is capable of providing an appropriate acoustic environment to provide comfort for building users.	Hea 05:01	Acoustic Performance - Appropriate acoustic performance standards and testing requirements met for Sound Insulation, Reverberation Times, Ambient Noise.	Professional report / study and calculations from the acoustician.	Applied Acoustic Design - Acoustician	Acoustic strategy to be confirmed		3	2	2	BREEAM Link Head 05
Hea 06 Security	To encourage the planning and implementation of effective measures that provide an appropriate level of security to the building and site.	Hea 06:01	Security of Site and Building - A suitably qualified security specialist (SQSS) conducts a Security Needs Assessment (SNA) during or prior to RIBA Stage 2	Design drawings / specifications / correspondence	Client and Ed Toovey - Architecture	Secure by design compliance / principles of	RIBA 2	1	1	1	BREEAM Link Head 06
Hea 07 Safe and healthy surroundings	To encourage the provision of safe access around the site and outdoor space that enhances the wellbeing of building users. .	Hea 07:01	Safe Access – Where external site areas meet relevant safety standards for pedestrian, cyclist, vehicular and delivery areas.	Design drawings / specifications	Client and Ed Toovey - Architecture	Vehicle, delivery, pedestrian & cycle access not separated		1	0	1	BREEAM Link Head 07
		Hea 07:02	Outside Space - There is an outdoor space providing building users with an external amenity area.	Design drawings / specifications	Client and Ed Toovey - Architecture	Outdoor landscaped area with seating and to be non-smoking		1	1	1	
Total								18	12	14	

KEY:

BREEAM AP REPORT	PR PRERQUISITE	FOR CONSIDERATION	RIBA 1	RIBA 2	RIBA 3	RIBA 4
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Highgate School Mallison Sports Centre

BREEAM Pre Assessment

Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Energy	23		9	12
			Unclassified 0%	Excellent 74.58%

Energy	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Ene 01 Reduction of energy use and carbon emissions	To minimise operational energy demand, primary energy consumption and CO2 emissions.	Ene 01:01	Energy Performance - Calculation of Energy Performance Ratio for New Constructions (EPRNC), based on energy performance, energy consumption & CO2 emissions	A copy of the BRUKL Output Document / calculations confirming energy consumption / calculations confirming energy generation	PDA - M&E Engineers	Energy strategy expected to target 'Excellent' Standard		9	1	4	BREEAM Link Ene01
		Workshop	The design team must hold a preliminary design workshop focusing on operational energy performance	Meeting minutes	PDA - M&E Engineers	RIBA Stage 2 requirements	RIBA 2				
		Ene 01:02	Prediction of Operational Energy Consumption - Additional energy modelling (design and post construction stage) to generate predicted operational energy consumption figures	Report predicted energy consumption targets by end use design assumptions and input data	PDA - M&E Engineers	design team workshop and reporting the predicted energy consumption target		4	2	2	
Ene 02 Energy monitoring	To encourage the installation of energy sub-metering that facilitates the monitoring of operational energy consumption. To enable managers and consultants post-handover to compare actual performance with targets in order to inform ongoing management and help in reducing the performance gap.	Ene 02:01	Sub-metering (Energy) - metering systems installed to enable at least 90% of estimated annual energy consumption of each fuel assigned to end-use categories	Relevant section/clauses of the building specification or contract. Design drawings	PDA - M&E Engineers	Sub-metering in line with CIBSE		1	1	1	BREEAM Link Ene02
		Ene 02:02	Sub-metering (High Load & Tenancy) - An accessible energy monitoring and management system or separate energy sub-meters for predominant areas	Relevant section/clauses of the building specification or contract. Design drawings	PDA - M&E Engineers	Sub-metering per floor plate or unit		1	1	1	
Ene 03 External lighting	To reduce energy consumption through the specification of energy efficient light fittings for external areas of the development	Ene 03:01	External Lighting - Average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 l/cW with relevant controls.	Specification / design drawings	PDA - M&E Engineers	Ext light fittings to be efficient		1	1	1	BREEAM Link Ene03
Ene 04 Low carbon design	To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.	Ene 04:01	Passive Design (Analysis) - Passive design measures to reduce total heating, cooling, mechanical and lighting demand in line with the Passive Design Analysis	Passive Design Analysis report / design drawings / specification	PDA - M&E Engineers	undertaken pre-planning	RIBA 2	1	0	0	BREEAM Link Ene04
		Ene 04:02	Passive Design (Cooling) - Building uses free cooling strategies to reduce the cooling energy demand	Results from a dynamic simulation model demonstrating the feasibility of the free cooling strategy and meeting the first credit for Hea 04.	PDA - M&E Engineers	Free cooling strategy unlikely		1	0	0	
		Ene 04:03	L2D Technologies - Low zero carbon feasibility study & L2D specified	The consultant feasibility report / design drawings / specification	PDA - M&E Engineers	undertaken pre-planning	RIBA 2	1	1	1	
Ene 05 Energy efficient cold storage	To encourage the installation of energy efficient refrigeration systems, in order to reduce operational greenhouse gas emissions resulting from the system's energy use.	Ene 05:01	Refrigeration energy consumption								BREEAM Link Ene05
Ene 06 Energy efficient transportation systems	To encourage the specification of energy efficient transport systems within buildings.	Ene 06:01	Lifts (Energy Consumption) - Analysis of the transportation demand and usage patterns for the building to determine the optimum number and size of lifts		PDA & Main contractor and lift manufacture	Lift strategy expected to meet design & efficiency requirements		1	1	1	BREEAM Link Ene06
		Ene 06:02	Lifts (Energy Efficiency) - Relevant energy efficiency measures are specified		PDA & Main contractor and lift manufacture			1	1	1	
Ene 07 Energy efficient laboratory systems	To encourage laboratory areas that are designed to minimise their operational energy consumption and associated CO2 emission	Ene 07:01	Design specification								
Ene 08 Energy efficient equipment	To encourage installation of energy efficient equipment to ensure optimum performance and energy savings in operation	Ene 08:01	Energy Efficient Equipment - Major systems / processes demonstrate a meaningful reduction in the total unregulated energy demand of the building.	Specification / Manufacturers product details / Documentation confirming compliance with relevant scheme or standard outlined	PDA - M&E Engineers	CIBSE TM 54 calculations		2	0	0	BREEAM Link Ene08
Total								23	9	12	

KEY:

BREEAM AP REPORT	PR PREREQUISITE	FOR CONSIDERATION	RIBA 1	RIBA 2	RIBA 3	RIBA 4
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Highgate School Mallison Sports Centre

BREEAM Pre Assessment

Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Transport	11		6	6
			Unclassified 0%	Excellent 74.58%

Transport	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Tra 01 Transport assessment and travel plan	To reward awareness of existing local transport and identify improvements to make it more sustainable	Tra 01:01	Travel plan - A site specific travel assessment & travel plan has been developed as part of the feasibility and design stages covering key travel issues & implementations.	A copy of the Travel Plan / Transport Assessment & commitment to implement.	Transport consultant or BREEAM Assessor	Travel / transport plan to be commissioned	RIBA 2	1	1	1	BREEAM Link Tra01
Tra 02 Sustainable transport measures	To maximise the potential for local public, private and active transport through provision of sustainable transport measures appropriate to the site.	Tra 02:01	Assessment option 1 - Accessibility index >8	Accessibility index calculation / Design drawings / specifications	Transport consultant or BREEAM Assessor	Transport Report confirm PTAL rating 1b equal to accessibility index of 5 . Credit not met.		1	0	0	BREEAM Link Tra02
		Tra 02:02	Assessment option 2 - Demonstrate an increase in Accessibility index or provide a dedicated service	Accessibility index calculation / Design drawings / specifications		Additional bus service not expected to be provided		1	0	0	
		Tra 02:03	Assessment option 3 - Provide a public transport information system	Design drawings / specifications- (see transport statement for evidence)	Stephen Freeth / HGS	Display of up to date travel information.		1	1	1	
		Tra 02:04	Assessment option 4 - Provide electric recharging stations of a minimum of 3kW for >10% of the total car parking capacity	Design drawings / specifications- (see transport statement for evidence)	Transport consultant or BREEAM Assessor			1	1	0	
		Tra 02:05	Assessment option 5 - Setup a car sharing group	Letter of commitment / Travel plan	Stephen Freeth / HGS	Provide priority spaces for 5% of total capacity		1	0	0	
		Tra 02:06	Assessment option 6 - Consult with the LA on how to improve the local cycling network and public accessible pedestrian routes.	Meeting minutes / Design drawings / specifications		Not target as complex question		1	0	0	
		Tra 02:07	Assessment option 7 - Compliant cycle storage spaces that meet the minimum levels prescribed depending on building type	Design drawings / specifications- (see transport statement for evidence)	Transport consultant or BREEAM Assessor	1 cycle storage space per 10 staff		1	1	1	
		Tra 02:08	Assessment option 8 - Compliant cycle changing / showers / drying space that meet the minimum levels prescribed	Design drawings / specifications- (see transport statement for evidence)	Transport consultant or BREEAM Assessor	A separate bench in the shower room needs to be provided		1	1	1	
		Tra 02:09	Assessment option 9 - close proximity to three existing local amenities relevant to building type	Design drawings / specifications- (see transport statement for evidence)	Transport consultant or BREEAM Assessor	Lack of amenities currently surrounding site		1	1	1	
		Tra 02:10	Assessment option 10 - one (2 points) or more (3 points) accessible amenities are provided relevant to building type	Travel Plan / Design drawings / specifications	Transport consultant or BREEAM Assessor	Assumed no additional amenities to be provided		1		1	
Total								11	6	6	

KEY:

BREEAM AP REPORT	PR PRERQUISITE	FOR CONSIDERATION	RIBA 1	RIBA 2	RIBA 3	RIBA 4
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	Available Credits		Expected Targeted Credits	Targeted for Excellent
Water	9		7	7
			Unclassified 0%	Excellent 74.58%

Water	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Wat 01 Water consumption	To reduce the consumption of potable water for sanitary use in new buildings through the use of water efficient components and water recycling systems.	Wat 01:01	Water Consumption - The water consumption (litres/person/day) for the assessed building is compared against a baseline performance.	Calculator tool / documentary evidence supporting the data used to complete the tool	Mechanical designers and Architect	40% improvement over the baseline		5	3	3	BREEAM Link Wat01
Wat 02 Water monitoring	To reduce the consumption of potable water in new buildings through the effective management and monitoring of water consumption.	Wat 02:01	Reducing the unintended water consumption due to leaks by installing leak detection systems and flow control devices Water monitoring - Water-consuming plant / areas, consuming >10% of the total water demand, have water monitoring equipment (meters), min 1 per building.	Relevant section/clauses of the building specification or contract / Design drawings	Mechanical design Team	Standard implementation		1	1	1	BREEAM Link Wat02
Wat 03 Water leak detection	To reduce the consumption of potable water in new buildings through minimising wastage due to water leaks.	Wat 03:01	Leak Detection System - A system capable of detecting a major water leak on mains water supply between the building and utilities water meter is installed	Relevant section/clauses of the building specification or contract / design drawings	Mechanical design Team	BMS leak detection on sub meters would be required		1	1	1	BREEAM Link Wat03
		Wat 03:02	Flow Control Devices - devices that regulate the supply of water to each WC area/facility according to demand are installed	Relevant section/clauses of the building specification or contract / design drawings	Mechanical design Team	Solenoid valve / PIR required to WCs		1	1	1	
Wat 04 Water efficient equipment	To reduce water consumption for uses not assessed under Wat 01 by encouraging specification of water efficient equipment	Wat 04:01	Water Efficient Equipment - System / processes are identified to reduce water demand and reduce the total water demand of the building.	Documentation detailing irrigation strategy / specification				1	1	1	BREEAM Link Wat04
Total								9	7	7	

KEY:						
BREEAM AP REPORT	PR PRERQUISITE	FOR CONSIDERATION	RIBA 1	RIBA 2	RIBA 3	RIBA 4

Peter Deer and Associates Sustainability ■ Environmental Consultancy

Highgate School Mallison Sports Centre BREEAM Pre Assessment Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Materials	14		5	13
			Unclassified 0%	Excellent 74.58%

Materials	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)	To reduce the burden on the environment from construction products by recognising and encouraging measures to optimise construction product consumption efficiency and the selection of products with a low environmental impact (including embodied carbon), over the life cycle of the building.	Mat 01:01	Superstructure LCA - The building's quantified environmental life cycle impact through assessment of the superstructure.	Calculator tool / materials specification / design drawings	Ed Toovey - Architecture	LCA options appraisal to be commissioned for RIBA stage 4	Risk	6	1	6	BREEAM Link Mat01
		Mat 01:02	Substructure and hard landscaping options appraisal - The building's quantified environmental life cycle impact through assessment of the substructure and hard landscaping.	Calculator tool / materials specification / design drawings		RIBA Stage 2 requirement	RIBA 2	3	3	1	
Mat 02 Environmental impacts from construction products - Environmental Product Declarations (EPD)	To encourage availability of robust and comparable data on the impacts of construction products through the provision of EPD.	Mat 02:01	Specification of products with EPD - achieve a total EPD points score	Drawings / Specifications		LCA to include EPDs	risk	1	0	1	BREEAM Link Mat02
Mat 03 Responsible sourcing of construction products	To facilitate the selection of products that involve lower levels of negative environmental, economic and social impact across their supply chain including extraction, processing and manufacture	Mat 03:01	All timber and timber based products used on the project is 'legally harvested and traded timber'	Specifications / contract extract Calculator tool / materials specification	Contractor	Considered standard implementation		pr			BREEAM Link Mat03
		Mat 03:01	Sustainable Procurement Plan - The principal contractor sources materials for the project in accordance with a sustainable procurement	Specifications / contract extract		RIBA Stage 2 requirement	RIBA 2	1	0	1	
		Mat 03:02	Responsible sourcing of materials (RSM) - The applicable building & hard landscaping materials are responsibly sourced in accordance with BREEAM	Calculator tool / materials specification	Contractor - to be confirmed	To standard practice		3	2	2	
Mat 05 Designing for durability and resilience	To minimise the future need of carrying out works to adapt the building to take account of more extreme weather changes resulting from climate change and changing weather patterns.	Mat 05:01	Robust Design - Protecting vulnerable parts of the building from damage and protection of exposed parts of the building from material degradation	Drawings / Specifications	Ed Toovey - Architecture	Considered standard implementation		1	1	1	BREEAM Link Mat05
Mat 06 Material efficiency	To avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.	Mat 06:01	Material Efficiency - Opportunities / measures are identified to optimise the use of materials during procurement, construction, maintenance & end of life.	Communication records / design drawings	Ed Toovey - Architecture	RIBA Stage 1 requirements	RIBA 1	4	0	1	BREEAM Link Mat06
Total								14	5	13	

Peter Deer and Associates Sustainability ■ Environmental Consultancy

Highgate School Mallison Sports Centre BREEAM Pre Assessment Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Waste	10		6	8
			Unclassified 0%	Excellent 74.58%

Waste	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Wst 01 Construction waste management	To reduce construction waste by encouraging reuse, recovery and best practice waste management practicesto minimise waste going to landfill.	Wst 01:01	Complete a pre-demolition audit of any existing buildings	copy of the resource management plan / pre demolition audit	Project manager and Ed Toovey - Architecture	< 6.5/100m2 waste generated		1	1	1	BREEAM Link Wst01
		Wst 01:02	Prepare a compliant Resource Management Plan (RMP)	copy of the resource management plan / pre demolition audit	Contractor - to be confirmed	80% of waste diverted from landfill		1	1	1	
		Wst 01:03	diversion from landfill benchmarks	copy of the resource management plan / pre demolition audit	Contractor - to be confirmed			2	2	2	
		Wst 01:04	maximising the recovery of material during demolition and diverting non-hazardous waste from landfill.	copy of the resource management plan / pre demolition audit	Contractor - to be confirmed			1	1	1	
Wst 02 Use of recycled and sustainably sourced aggregates	To encourage the use of more sustainably sourced aggregates, encourage reuse where appropriate and avoid waste and pollution arising from disposal of demolition and other forms of waste.	Wst 02:01	Project Sustainable Aggregate Points - Percentage of high-grade aggregate that is recycled and/or secondary aggregate meets minimum % levels	Design drawings		Not typically undertaken as standard		1	0	0	BREEAM Link Wst02
Wst 03 Operational waste	To encourage the recycling of operational waste through the provision of dedicated storage facilities and space.	Wst 03:01	Operational waste - Dedicated space is provided for the segregation and storage of operational recyclable waste volumes generated by the building/unit	Design drawings	Ed Toovey - Architecture	Standard implementation		1	1	1	BREEAM Link Wst03
Wst 04 Speculative finishes (Offices only)	To minimise the wastage associated with the installation of floor and ceiling finishes in lettable areas in speculative buildings where tenants have not been involved in their selection.	Wst 04:01	Speculative floor and ceiling finishes – Tenanted areas (speculative) have carpets, other floor finishes and ceiling finishes installed in a show area only	Meeting minutes / specification		Default no speculative finishes		NS	NS		
Wst 05 Adaptation to climate change	To minimise the future need of carrying out works to adapt the building to take account of more extreme weather changes resulting from climate change and changing weather patterns.	Wst 05:01	Encouraging consideration and implementation of measures to mitigate the impact of more extreme weather conditions arising from climate change over the lifespan of the building. Adaptation to Climate Change - Conduct a climate change adaptation strategy appraisal for structural and fabric resilience & systematic risk assessment	Special Report	Ed Toovey - Architecture with support of design team	Design report with strategy for climate change	RIBA 2	1	0	1	BREEAM Link Wst05
Wst 06 Design for disassembly and adaptability	To avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy.	Wst 06:01	Disassembly and adaptability (recommendations) – building specific functional adaptation and disassembly strategy study has been undertaken by the client & design team	Functional adaptation and disassembly strategy	Ed Toovey - Architecture with support of design team	RIBA Stage 2 requirements	RIBA 2	1	0	1	BREEAM Link Wst06
		Wst 06:02	Disassembly and adaptability (implementation) - produce a building adaptability and disassembly guide for prospective tenants	Building adaptability and disassembly guide	Ed Toovey - Architecture with support of design team	Design report with strategy build future - proofing	RIBA 4	1	0	0	
Total								10	6	8	

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Ecology	13		6	9
			Unclassified 0%	Excellent 74.58%

Land Use and Ecology	Aim	Sub Credit	Credit summary	Evidence	Responsibility	Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
LE 01 Site selection	To encourage the use of previously occupied or contaminated land and avoid land which has not been previously disturbed	LE 01 :01	Previously Occupied Land - 75% of the proposed development's footprint is on an area of land which has previously been occupied /developed.	Design drawings / type / duration of previous land use / area (m2) of previous land use / location and footprint of proposed development		Greenfield site		1	0	1	BREEAM Link Le01
		LE 01 :02	Contaminated Land - site deemed as significantly contaminated & confirmed by contaminated land specialist's site investigation, risk assessment & appraisal	Remediation strategy / implementation plan		Land assumed not contaminated		1	0	0	
LE 02 Identifying and understanding the risks and opportunities for the project	To determine the ecological baseline and zone of influence of the site and identify risks and opportunities for achieving optimum outcomes.	Pre Requisite	Assessment Route Selection - Assessment route selected using BREEAM Guidance Note 34 & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site.	Guidance Note 34 BREEAM Ecological Risk Evaluation Checklist / written confirmation	Applied Ecologist	Route 2 achieves higher level of reward		PR			BREEAM Link Le02
		LE 02 :01	Survey and Evaluation - Establish current & potential ecological value, direct & indirect risks to value, and capacity for enhancement of value	Ecologists report / design drawings	Applied Ecologist	Determine ecological baseline & zone of influence		1	1	1	
		LE 02 :02	Ecological Outcomes - Avoidance, protection, reduction, on site compensation and enhancement of ecological value.	Ecologists report / design drawings / written confirmation ecologists report will be implemented	Applied Ecologist & Contractor	Select the optimal ecological outcome for the site		1	0	local air	
LE 03 Managing negative impacts on ecology	To avoid, or limit as far as possible, negative impacts on the ecology of the site and its zone of influence arising as a result of the project. Recognition of steps taken to avoid impacts on existing site ecology as far as possible	LE 03 :01	Assessment Route Selection - Assessment route selected using BREEAM Guidance Note 34 & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site.		Applied Ecologist & Contractor			PR			BREEAM Link Le03
		LE 03 :02	Enhancement of ecology - Credits awarded on a scale of 1-3 based on the calculation of the change in ecological value occurring as a result of the project	Liaison, implementation and data collation - Ecological value enhanced on site and where this is not feasible, off site within the zone of influence.	Applied Ecologist & Contractor	Plan for construction works	RIBA 1	3	2	2	
LE 04 Change and enhancement of ecological value	To enhance the ecological value of the site and areas within its zone of influence in support of local, regional and national priorities.	Pre Requisite	Risks and Opportunities- LE03 achieved & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site.	Written confirmation	Applied Ecologist & Contractor	Assumed no overall loss of ecological value		PR			BREEAM Link Le04
		LE 04 :01	Liaison, implementation and data collation - Ecological value enhanced on site and where this is not feasible, off site within the zone of influence.	Ecologists report / design drawings / written confirmation ecologists report will be implemented	Applied Ecologist	Liaise with stakeholders to discuss on site or off site enhancement		1	1	1	
		LE 04 :02	Enhancement of ecology - Credits awarded on a scale of 1-3 based on the calculation of the change in ecological value occurring as a result of the project.	Ecologists report / design drawings / written confirmation ecologists report will be implemented	Applied Ecologist	To be calculated by ecologist		3	0	2	
LE 05 Long term ecology management and maintenance	To secure ongoing monitoring, management and maintenance of the site and, its habitats ecological features to ensure intended outcomes are realised for the long term. Encouraging the long-term maintenance and management of ecology on site to ensure both new and existing ecological features continue to thrive.	Pre Requisite	Roles & Responsibilities. Implementation, Statutory Obligations - LE04 achieved & Compliance monitored against all relevant UK and EU legislation relating to ecology of the site adopted	Written confirmation	Applied Ecologist						BREEAM Link Le05
		LE 05 :01	Planning, Liaison, Data, Monitoring, Review Management & Maintenance - Strategy developed to monitor, report and maintain ecology.	Ecologists report / design drawings / written confirmation ecologists report will be implemented / management plan	Applied Ecologist	Liaise with stakeholders to provide strategy to maintain ecology		1	1	1	
		LE 05 :02	Landscape and Ecology Management Plan Development – Plan developed in accordance with BS 42020:2013 covering five years.	Landscape and habitat management plan	Applied Ecologist	Maintenance of ecology		1	1	1	
Total								13	6	9	

KEY:

BREEAM AP REPORT	PR PREREQUISITE	FOR CONSIDERATION	RIBA 1	RIBA 2	RIBA 3	RIBA 4
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Peter Deer and Associates Sustainability ■ Environmental Consultancy

Highgate School Mallison Sports Centre BREEAM Pre Assessment Report Table

	Available Credits		Expected Targeted Credits	Targeted for Excellent
Pollution	12		9	11
			Very good 59.15%	Excellent 76.19%

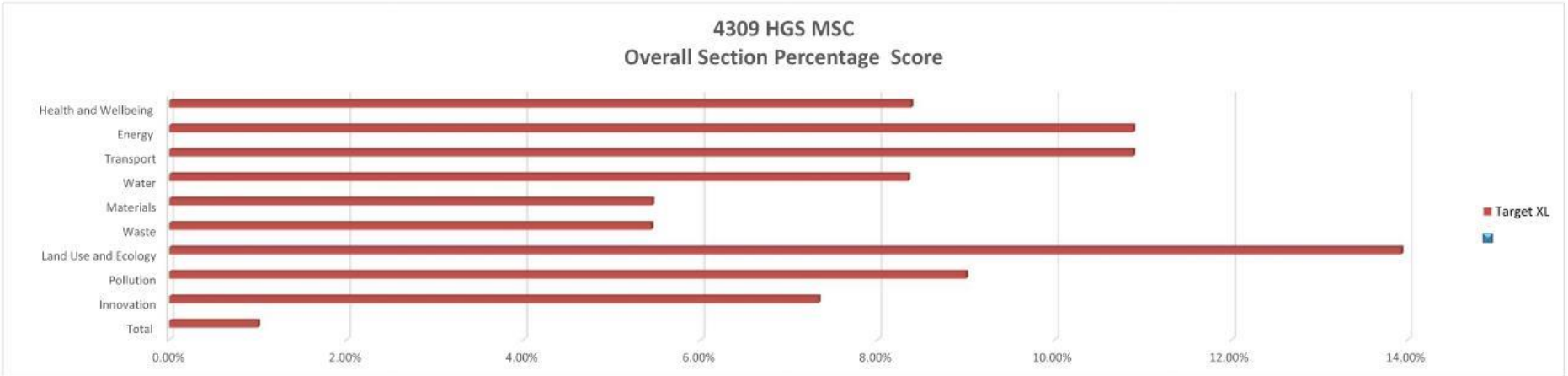
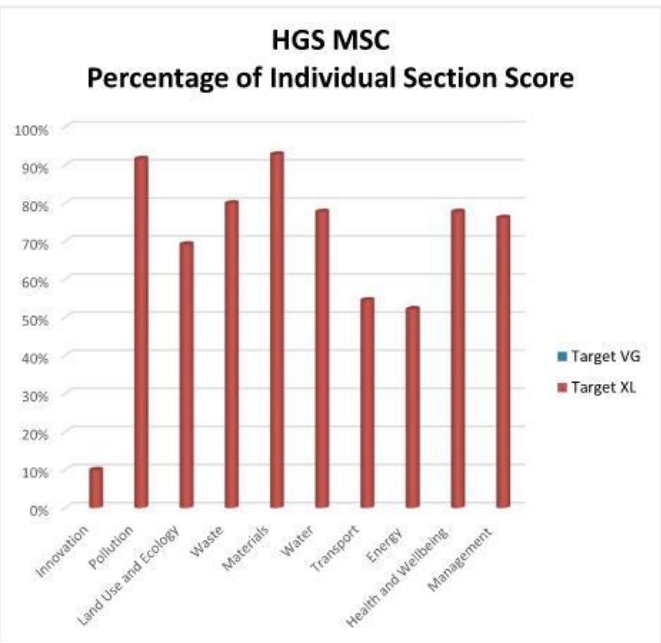
Pollution	Aim	Sub Credit	Credit summary	Evidence		Comment	Risk	Available credits	Expected Targeted Credits	Targeted for Excellent	Link
Pol 01 Impact of refrigerants	To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems. Rewarding buildings that reduce the impact of refrigerant gas emissions.	Pol 01:01	Impact of Refrigerants - the buildings use of refrigerants within its installed plant/systems is avoided or meet relevant BREEAM design criteria	Calculator tool / evidence supporting the data within the tool	Mechanical designers	Assumes no refrigerant cooling within the design		2	0	2	BREEAM Link Pol01
		Pol 01:02	Leak Detection - Where systems using refrigerants have a permanent automated refrigerant leak detection system installed to isolate leakages.	Specification/ Design Drawings/ Manufacturers details				1	1	1	
Pol 02 Local air quality	To contribute to a reduction in local air pollution through the use of low emission combustion appliances in the building. Recognising buildings which limit their impact on local air quality, by consideration of the combustion plant and fuel used on site.	Pol 02:01	Local air quality - Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed BREEAM levels	Calculations showing the average Nox emissions / manufacturers product details	Mechanical designers	Medium to high pollution location		2	2	2	BREEAM Link Pol02
Pol 03 Flood and surface water management	To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, thereby minimising the risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage. Rewarding buildings and their sites that limit on-site and off-site local flooding and hence the damage this can cause.	Pol 03:01	Surface water run-off - An appropriate consultant is appointed to array out, demonstrate and/or confirm the surface water design strategy	Professional report / specification	Planning flood risk consultant			PR			BREEAM Link Pol03
		Pol 03:02	Flood Resilience - Where a site-specific flood risk assessment (FRA) confirms the development is situated in a low / medium risk flood zone	Flood risk assessment	Planning flood risk consultant	Assumed low flood risk		2	2	2	
		Pol 03:03	Surface water run-off -Surface water run-off design solutions must be bespoke taking into account the site specific requirements.	Professional report / specification	Planning flood risk consultant			PR			
		Pol 03:04	Surface water run-off (Rate) - Drainage measures ensure that peak rate of run-off from the site to the watercourses shows a 30% improvement	Calculations for the pre and post development peak rate run-off	Planning flood risk consultant	Surface Water strategy likely required to meet authority compliance - risk of drainage failure tbc		1	1	1	
		Pol 03:05	Surface water run-off (Volume)- Where flooding of property will not occur in the event of local drainage system failure	Information showing the proposed drainage solution	Planning flood risk consultant			1	1	1	
		Pol 03:06	Minimising watercourse pollution - There is no discharge for rainfall up to 5mm & an appropriate level of pollution prevention treatment is provided (SUDS)	Professional report / specification				1	0	0	
Pol 04 Reduction of night time light pollution	To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties	Pol 04:01	Light Pollution - External lighting strategy meets ILP Guidance notes without adversely affecting the safety and security of the site and its users. Avoiding or reducing the impact of night time light pollution, through careful design and specification of light sources.	Design drawings / specification	Electrical Lighting designer	Time clock & photocell on non-essential external lighting		1	1	1	BREEAM Link Pol04
Pol 05 Reduction of noise pollution	To reduce the likelihood of noise arising from fixed installations on the new development affecting nearby noise-sensitive buildings. Avoiding or reducing the impact of external noise from the building.	Pol 05:01	External Noise - a noise impact assessment in compliance with BS 4142 has been carried out & does not affect noise sensitive areas within 80	Design drawings / the acousticians report OR confirmation one will be produced / drawings showing measures implemented	Acoustician	Acoustic background noise report / survey		1	1	1	BREEAM Link Pol05
Total								12	9	11	

KEY:
BREEAM AP REPORT PR PRERQUISITE FOR CONSIDERATION RIBA 1 RIBA 2 RIBA 3 RIBA 4

	Possible Credits	Targeted Credits	Excellent Targeted Credits	% of Credits Achieved for Very Good	% of Credits achieved for Excellent	Category Weighting	Section Score for Excellent Rating
Management	21	13	16	62%	76%	11%	8.4%
Health and Wellbeing	18	12	14	67%	78%	14%	10.9%
Energy	23	9	12	39%	52%	16%	8.3%
Transport	11	6	6	55%	55%	10%	5.5%
Water	9	7	7	78%	78%	7%	5.4%
Materials	14	5	13	36%	93%	15%	13.9%
Waste	10	6	8	60%	80%	6%	4.8%
Land Use and Ecology	13	6	9	46%	69%	13%	9.0%
Pollution	12	9	11	75%	92%	8%	7.3%
Innovation	10	1	1	10%	10%	10%	1.0%

Total 75%

Unclassified Excellent



Highgate School Mallison Sports Centre

BREEAM Pre Assessment

RIBA Plan Of Works

Management

Section	Credit Summary	Available	Target for Very Good	Target for Excellent	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Man 01 Project brief and design	Project Delivery Planning	4	4	4							
	Third Party Stakeholder Consultation										
	BREEAM AP (Concept Design)						Maximise Project Performance	Maximise Project Performance			
	BREEAM AP (Developed Design)										
Man 02 Life cycle cost and service life planning		4	1	1			Elemental LCC		Component level LLC options		
	Capital Cost Reporting										
Man 03 Responsible construction practices	Component level LCC options appraisal	6	4	6							
	Capital cost reporting										
	Environmental management										
	BREEAM AP (site)										
Man 04 Commissioning and handover	Responsible Construction Management	4	2	2							
	Monitoring of construction site impacts									Building user guides and training schedules prepared	Building user guides and training schedules prepared
Man 05 Aftercare	Aftercare Support	3	2	3							
	Commissioning - implementation										
	Post-occupancy evaluation (POE)										

Plan of Works Background Colour Key	
	Design or management influence
	Design client decision
	Design or management changes at high cost
	No Further changes can be made
	RIBA stage stipulated within breem

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

RIBA Plan Of Works

Health and Wellbeing

Section	Credit Summary	Available	Target for Very Good	Target for Excellent	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Hea 01 Visual comfort	Glare control	5	2	2							
	Daylighting										
	View Out										
	Internal / External Lighting										
Hea 02 Indoor air quality	Indoor Air Quality (IAQ) Plan	4	3	4							
	Air Quality (Ventilation)										
	Air Quality (VOC's)										
Hea 04 Thermal comfort	Thermal Modelling	3	3	3							
	Adaptability (Climate Change)										
	Thermal Zoning & Controls										
Hea 05 Acoustic performance	Accoustic Performance	3	2	2			Acoustician appointment				
Hea 06 Security	Security of Site and Building	1	1	1			Security consultant appointment				
Hea 07 Safe and healthy surroundings	Safe Access	2	1	2							
	Outside Space										

Energy

Section	Credit Summary	Available	Target for Very Good	Target for Excellent	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Ene 01 Reduction of energy use and carbon emissions	Energy Performance	13	3	6							
	Workshop										
	Prediction of Operational Energy Consumption										
Ene 02 Energy monitoring	Sub-metering (Energy)	2	2	2							
	Sub-metering (High Load & Tenancy)										
Ene 03 External lighting	External Lighting	1	1	1							
Ene 04 Low carbon design	Passive Design (Analysis)	3	1	1			Passive design analysis				
	Passive Design (Cooling)										
	LZC Technologies						Feasibility study				
Ene 05 Energy-efficient cold storage		0	0	0							
Ene 06 Energy efficient transportation systems	Lifts (Energy Consumption)	2	2	2							
	Lifts (Energy Efficiency)										
Ene 07 Energy efficient laboratory systems		0	0	0		Client Engagement					
Ene 08 Energy efficient equipment	Energy Efficient Equipment	2	0	0							

Plan of Works Background Colour Key

	Design or management influence
	Design client decision
	Design or management changes at high cost
	No Further changes can be made
	RIBA stage stipulated within breem

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

RIBA Plan Of Works

Transport

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Tra 01 Transport assessment and travel plan	Travel Plan	1	1				Travel Plan				
Tra 02 Sustainable transport measures	Assessment option 1	10	5	5		Consultation with local authority (option 6 only)					
	Assessment option 2										
	Assessment option 3										
	Assessment option 4										
	Assessment option 5										
	Assessment option 6										
	Assessment option 7										
	Assessment option 8										
	Assessment option 9										
	Assessment option 10										

Water

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Wat 01 Water consumption	Water Consumption	5	3	3							
Wat 02 Water monitoring	Water Consumption	1	1	1							
Wat 03 Water leak detection	Leak Detection System	2	2	2							
	Flow Control Devices										
Wat 04 Water efficient equipment	Water Efficient Equipment	1	1	1							

Materials

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)	Superstructure LCA	7	2	7			Building LCA submission		Building LCA submission		
	Substructure and hard landscaping options appraisal										
Mat 02 Environmental impacts from construction products - Environmental Product Declarations (EPD)	Specification of products with EPD	1	0	1						Installation of certified products	
Mat 03 Responsible sourcing of construction products	Timber based products used is 'Legally harvested and traded timber'	4	2	3		Sustainable procurement plan	Review sustainable procurement plan	Review sustainable procurement plan			
	Sustainable Procurement Plan										
	Responsible Sourcing of materials (RSM)										
Mat 05 Designing for durability and resilience	Robust Design	1	1	1							
Mat 06 Material efficiency	Material Efficiency	1									

Plan of Works Background Colour Key

	Design or management influence
	Design client decision
	Design or management changes at high cost
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	RIBA stage stipulated within breem

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

RIBA Plan Of Works

Waste

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Wst 01 Construction waste management	Complete a pre-demolition audit of any buildings	5	5	5			Pre demolition audit				
	Prepare a compliant RMP diversion from landfill benchmarks maximising the recovery of material during demolition and diverting non-hazardous waste from landfill										
Wst 02 Use of recycled and sustainably sourced aggregates	Project Sustainable Aggregate Points	1	0	0							
Wst 03 Operational waste	Operational Waste	1	1	1							
Wst 04 Speculative finishes (Offices only)	Speculative floor and ceiling finishes										
Wst 05 Adaptation to climate change		1	0	1			Climate adaptation strategy appraisal		Update on Climate adaptation strategy appraisal		
Wst 06 Design for disassembly and adaptability	Design and disassembly and functional adaptability	2	0	1			Disassembly and functional adaptation study				
	Adaptability: Potential for natural ventilation										

Land Use and Ecology

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
LE 01 Site selection	Previously Occupied Land	2	0	1							
	Contaminated Land										
LE 02 Identifying and understanding the risks and opportunities for the project	Survey and Evaluation	2	1	1							
	Ecological Outcomes	3	2	2							
LE 03 Managing negative impacts on ecology	Assessment Route Selection	4	1	3							
	Enhancement of ecology										
LE 04 Change and enhancement of ecological value	Liaison, implementation and data collation	4	1	3							
	Enhancement of ecology										
LE 05 Long term ecology management and maintenance	Planning, Liaison, Data, Monitoring, Review Management & Maintenance Landscape and Ecology Management Plan Development	2	1	2							

Plan of Works Background Colour Key	
	Design or management influence
	Design client decision
	Design or management changes at high cost
	No Further changes can be made
	RIBA stage stipulated within breem

Highgate School Mallison Sports Centre

BREEAM Pre Assessment

RIBA Plan Of Works

Pollution

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Pol 01 Impact of refrigerants	Impact of Refrigerants	3	1	3							
	Leak Detection										
Pol 02 Local air quality	Local air quality	2	2	2							
Pol 03 Flood and surface water management	Surface water run-off	5	4	4							
	Flood Resilience										
	Surface water run-off										
	Surface water run-off (Rate)										
	Surface water run-off (Volume)										
	Minimising watercourse pollution										
Pol 04 Reduction of night time light pollution	Light Pollution	1	1	1							
Pol 05 Reduction of noise pollution	External Noise	1	1	1							

Section	Credit Summary	Available	Target for Very Good	Target for Excellent.	Strategic Definition	Preparation and Brief	Concept Design	Developed Design	Tehnical Design	Construction	Handover and Close-out
Inn 01 Innovation											

Plan of Works Background Colour Key	
	Design or management influence
	Design client decision
	Design or management changes at high cost
	No Further changes changes can be made
	RIBA stage stipulated within breeam

Appendix B. London Borough of Haringey Climate Change Officer
Comments.

Validation requirements (for inclusion below):

- Energy Statement
- GLA carbon emission reporting spreadsheet
- Dynamic Thermal Model Overheating Assessment for all classrooms, office spaces, spaces requiring mechanical cooling and spaces where people spend significant amounts of time (CIBSE TM52)
- Sustainability Statement:
- BREEAM Pre-Assessment with a table to demonstrate which credits will be met, how many are met out of the total available, under which category could be achieved and which will not be met.
- Wider site-wide Sustainability Strategy, including sections on reducing whole-life carbon, promoting circular design principles, the proposed heating/cooling strategy, sustainable transport/movement strategy
- Biodiversity Net Gain / Urban Greening Factor Statement

MSC

Please address the following aspects:

- Explain the sustainable urban drainage strategy, including the orchard sports pitch.
- We discussed exploring waste-water heat recovery to bring down some of the hot water demand.
- Maximise the natural daylight through roof lights.
- Consider the energy reuse that combines the cooling and heating requirements of the different sports/pool areas. Include the longer-term decarbonisation of the centre and how it could interact with other buildings.
- Explain the ventilation strategy.
- Supportive of BREEAM Excellent target
- Ensure the landscaping is maximised for biodiversity benefits and amenity.
- Please set out the current and proposed space heating demands

Site location latitude 51.57419 North Longitude -0.15528 West.

Explain the sustainable urban drainage strategy, including the orchard sports pitch.

The drainage strategy is summarised in section 13 Pollution and fully explained in the Eden Vale Young Highgate School Flood Risk Assessment, and Pringuer James Consulting Engineer has developed the sustainable drainage proposal.

Eden Vale Young confirms the development is of Low flood risk from all potential sources of surface water flooding, including drains, culverts, sewers, and groundwater. It is in a flood zone, defined as having a low annual probability of flooding. There is a potential for flooding, as shown on the environment Agency surface water flood risk map

(See Edenvale Young flood risk assessment). Flooding may occur after a long and intense rainfall event when the ground cannot accept rainwater infiltration or flow into local sewers or watercourses.

The Edenvale Young report describes how potential flood risk is to be mitigated and contained within an upstream dam between the buildings and the Orchard Sportsground. These mitigation measures will reduce and control flood waters and avoid flooding the buildings.

The proposal is for various facilities such as a new sports hall, five courts, a new teaching office, changing room, a new entrance foyer and others. For full details of proposed works, please refer to the Design and Access Statement submitted under separate cover. The general impermeable area of the site will increase from the existing 2,185m2 (18% impermeable) to 3,846m2 (32% impermeable).

The development will discharge surface water in line with the requirements of the local planning authority and statutory undertakers and utilise Sustainable Urban Drainage System. Stormwater will discharge to the existing Thames Water stormwater sewer.

We discussed exploring waste-water heat recovery to bring down some of the hot water demand.

The shower rooms were refurbished as part of phase 1 swimming pool works. The shower room is on the ground floor for easy access to sporting facilities. The shower drains directly into the existing drainage system. The hot water generation plant is located close to the point of use for each changing room. The hot water storage cylinder uses a large 120kW external plate heat exchanger to heat domestic water, providing a robust domestic hot water flow rate and fast cylinder recovery time required for use in school changing rooms. Installing a waste-water heat recovery system requires finding a plant space near the shower rooms for the hot water cylinders.

It is technically possible to redirect cold water feed through a wastewater heat recovery under the shower room floor. Installing a wastewater heat recovery system would require substantial building works to remove the shower room floors and alter the domestic cold-water pipework.

The energy recovered from wastewater is unlikely to offset the loss of the embedded carbon from the removal of flooring and construction works. The energy saving is to be low as the shower water is mixed temperature and most heat energy is lost from the contact with the cold floor.

Overall, the energy saving from wastewater heat recovery is likely to be small compared with the cost of the works replacement building materials.

○ Maximise the natural daylight through roof lights.

The sports halls include high-level curtain walling and roof lights to provide an even level of daylight through the space.

Consider the energy reuse that combines the cooling and heating requirements of the different sports/pool areas. Include the longer-term decarbonisation of the centre and how it could interact with other buildings.

Space	Heating & cooling	Ventilation	Systems	Future decarbonisation
Swimming pool (Space heating, pool water heating)	A gas-fired boiler provides water for space heating via the ventilation plant and pool water heating.	Heating only ventilation plant. Humidity control by mixing the ratio of fresh and recycled air. Heat recovery between the exhaust and intake air streams. Variable volume, mixed fresh air to control humidity	A new installation as part of Phase 1 Works. Gas boilers. Fast recovery hot water cylinder of each changing room Air handling units fitted with LTHW ¹ heating coil.	The available space limits the selection of plants, requiring a compact system. The lack of space requires using heat pumps to operate efficiently at higher water temperatures to provide heat for the air handling plant and domestic hot water. Currently, no heat pumps are specifically designed for use in this type of building. As the market develops, it is expected that manufacturers will provide heat pumps using natural refrigerants capable of replacing boilers.
Changing rooms (Space heating and hot water)	The gas-fired boiler provides water for space heating via the ventilation plant and domestic hot water.	Heating only ventilation plant. Heat recovery between the exhaust and intake air streams. It is not required for humidity control	A new installation as part of Phase 1 Works. Gas boilers. Fast recovery hot water cylinder of each changing room. Air handling units fitted with LTHW1 heating coil	When a plant requires replacing, it is possible to swap out the boiler with a separate hot water system using high-temperature air-to-water heat pumps (LPG or CO ₂) and a separate heat pump for the air handling plant.
Existing Dry sports hall 1 (Space heating)	The primary heating is provided via the ventilation system.	Larger air handling plant with variable volume air control and heat recovery. Integral air source heat pump providing heat and cooling.	The proposal is to replace the gas-fired air handling units with new roof-mounted variable volume mixed fresh air units—refrigerant heating from air source heat pump integral with air handling unit.	The proposed replacement heating plant is all electric heat pumps.
New Dry Sports hall 2 and spectator gallery. (Space Heating)	The primary heating is provided via the ventilation system. A combination of electric radiant panels and heaters operates as a secondary heat source	Larger air handling plant with variable volume air control and heat recovery. Integral air source heat pump providing heat and cooling	New Plant	The proposed heating plant is all electric heat pumps.
Dance and Fitness Studio (Space heating and cooling)	Air Source heat pumps with direct expansion fan coil unit within the space	Mechanical ventilation with heat recovery units. Demand-controlled ventilation (humidity and CO ₂ sensors) is linked to the stepped ventilation unit speed controller. Humidity is reduced by increasing the ventilation rates in the room.	Multi-split heat pumps with reversible refrigerant heating and cooling.	The proposed replacement heating plant is all electric.
Classroom (Space heating)	Low-temperature radiators from air source air to water heat pump system	Demand controlled MVHR units or, where possible fresh air via openable windows and vents	Air to water heat pumps, supply low surface temperature radiators	The proposed replacement heating plant is all electric.
Storeroom (Space Heating)	Low-temperature radiators from air source air to water heat pump system	Fresh air via open windows and vents	Air to water heat pumps, supply low surface temperature radiators	The proposed replacement heating plant is all electric.
Circulation space (Space Heating)	Low-temperature radiators from air source air to water heat pump system	Fresh air via open windows and vents	Air to water heat pumps, supply low surface temperature radiators	The proposed replacement heating plant is all electric.

Future energy transfer between buildings.

Energy transfer between buildings is achieved by interconnecting buildings with an ambient water loop, from which water-to-water heat pumps extract or dump heat energy.

A vertical ground loop under school sporting facilities enables heat to be stored and recovered from the ground. This way, a building requiring heat extracts (cools) energy from the loop and has cooling load dump heat. As building energy use is seasonal, heating in winter and cooling in summer, the ambient loop should include a heat sink and heat source. An additional heat source may consist of solar thermal panels, which could heat all year due to the lower loop temperature.

Some advantage of the ground source heat pumps is derived from storing heating generated in the summer months from cooling for reuse in the winter. During the peak summer months, the school is not fully operational; therefore, most of the school buildings have no cooling; as a result, there is no energy balance. An energy balance is required for efficient heat transfer between facilities and seasons. An ambient water loop enables heat transfer between buildings using heat pumps, providing heat and cooling. The ambient loop requires an energy balance between buildings. The energy balance is often provided by extending the ground loop heat exchanger under open areas (sports pitches) supplemented with solar thermal. The ambient loop is a future development that works best at a district scale connecting multiple.

Further Decarbonisation of Heat

Phase 1 works involved completely refurbishing the swimming pool and changing rooms. The newly installed plant has a life expectancy of 20 years. The plant's items are expected to be replaced across this period. The installed system operates with a water flow temperature of 65°C and 40°C return water temperature. The size, fan power, and airflow rates determine the temperatures of the heating coil in the AHU. Heating coils operating at higher temperatures increase the heat transfer rate of the coil, Reducing pressure losses and airflow rates.

Plant space is a premium. Higher heating water temperatures reduce the volume and physical dimensions of the hot water cylinders by increasing the cylinder recovery times.

These parameters influence the choice of heat pump, combine heat and power (CHP) or fuel cell.

Carbon dioxide air to water heat pump

Air-to-water heat pumps using Carbon dioxide refrigerant can provide heating water of more than 60°C but require consistent return water temperature lower than 40°C. Achieving the consistently low return water temperature requires dumping excess heat into the swimming pool. Overheating the swimming pool may result in overheating pool water temperature, which increases ventilation and energy use to deal with additional humidity created by the overheated pool water.

Sealed ammonia heat pumps

Seal ammonia heat pumps operate at higher temperatures required for industrial use. Large district heating schemes requiring higher temperatures often deploy ammonia heat pumps. Ammonia heat pumps could efficiently provide the heating water temperatures by replacing the boilers. Ammonia is a toxic and dangerous chemical suitable for use in a school environment.

Air-to-water synthetic refrigerant heat pumps.

Synthetic refrigerants are general for their cooling properties and require additional electric immersion top-up heating to operate at higher water temperatures. Synthetics have high global warming potential and perform less well when the whole life carbon cycle is considered.

- **Sealed LPG refrigerant heat pumps.**

LPG refrigerant has similar properties to synthetic refrigerants with the ability to produce water consistently higher temper without loss of efficiency. LPG heat pumps are limited to domestic applications, and there are currently manufacturers.

Combined Heat Power (CHP)

CHP use a combustion engine to generate heat power from gas. The burning gas results in exhaust emissions, reducing local air quality. CHP is no longer considered a decarbonising energy technology.

Fuel cell heating,

A fuel cell is an electrochemical cell that converts the chemical energy of a fuel (often hydrogen) and an oxidising agent (often oxygen) into electricity through a pair of redox reactions (creating heat). Fuel cells differ from most batteries in requiring a continuous source of fuel and oxygen (usually from air) to sustain the chemical reaction. In contrast, in a battery, chemical energy usually comes from substances that are already present in the battery. Fuel cells can produce electricity continuously for as long as fuel and oxygen are supplied.

Fuel cells are in use worldwide but predicted breakthrough for general use is yet to come. The number of trial units working in London is connected to the gas supply from which the hydrogen is separated. Fuel cells are not classified as combined heat power units and are no longer considered low-carbon energy systems.

The capacity of the fuel cell is limited to the building's standing electrical load. A Fuel cell could operate as a **supplementary heat source**.

The capacity of the fuel cell is limited by the electrical standing load of the building.

Explain the ventilation strategy.

The Mallinson Sports Centre is a complex building, explaining the design strategy. The ventilation strategy is explained in the ventilation statement.

Supportive of BREEAM Excellent target

The sustainability statement details how the designers intend to meet the BREEAM Excellent rating. The project team currently works with the BREEAM 2018 new Construction Guidance documents and has developed the design brief and preliminary energy and management workshops. The appropriate BREEAM early design stage credit is recorded. The team has identified difficulty in meeting the flood management, Daylighting, and internal air quality, which requires a higher level of biodiversity, material selection and project management credits. The predicted score of 70 requires the design team and contractor to work together to maximise the other available credits.

The project MSC Sports facility is scheduled as one of the last projects within the Highgate school five sites master. The project has not been registered with BRE as the works are programmed as the last project with the school's main plan for the five sites. The planning information provided is the RIBA Stages 1 early design information. The RIBA Stage 2 & 3 design is to be developed further, and brief finalised post-2025.

As the RIBA design stage 2 is incomplete, some project team elements are to be confirmed. The school has decided to leave BREEAM registration to post planning, and Haringey will BRE Registration as a pre-commencement condition of the start of works.

Ensure the landscaping is maximised for biodiversity benefits and amenity.

The proposed development will improve the site biodiversity by:

- By planting mature trees, the existing woodland around the amphitheatre by the management and enhancing the variety of trees.
- Planting woodland, hedgerow, and meadow flower mixtures improve wildlife habitat and pollinators around the amphitheatre.
- New green roofs seeded with a mixture of wild meadow flowers and sedum on the new sports hall and five courts.

The new amphitheatres create a new amenity space for the school pupils and staff to relax or as a teaching and entertainment space.

Applied Ecology – Ecology Report (April 2022)

In April 2022, Applied Ecology Ltd was commissioned to conduct a Preliminary Ecological Appraisal (PEA) AEL was also commissioned to complete Biodiversity Net Gain (Defra Metric 3.1) and BREEAM assessments (BREEAM 2018 LE02–LE05) of the proposed Development, as well as to produce a Landscape Ecological Management Plan for the scheme.

The Ecology Report presents the findings of ecological appraisal in Chapter 2, highlighting any significant ecological constraints and opportunities relating to the proposed developments. It provides a Biodiversity Net Gain assessment in Chapter 3, a BREEAM assessment in Chapter 4, and Chapter 5 provides the LEMP for Development. Land associated with works associated with Highgate School Mallinson Sports Centre.

Chapter 2 Preliminary Ecological Appraisal.

The site is mainly amenity grassland of lower ecological value with areas of mature woodland with elevated ecological value.

There is a recommendation for site clearance to occur outside the breeding season to avoid habit loss.

The exterior lighting design considers the impact of lighting on the habitat areas of the local wildlife, especially around the woodland areas.

Any loss of the habitat as a result of the development should be compensated with species-specific enhancements

Chapter 3 Biodiversity Net Gain Assessment.

■ *Proposed ecological enhancements and habitat improvements.*

- The woodland will be enhanced from poor to moderate condition through selective felling (to focus on sycamore), planting of suitable native species, sowing of woodland flower mixture* to enhance the ground layer, restricted recreational use, and removal/cessation of dumping of gardening waste.
- The area surrounding the amphitheatre will be seeded with hedgerow flower mixture* suitable for semi-area and grassland mixture for the open areas.
- The proposal is to plant the green roofs with a mixture of sedum and low native wildflower plugs, which is considered likely to achieve moderate conditions.
- A total of 23 new small trees (trees likely to attain a DBH of <30 cm in 30 years) in the woodland area around the amphitheatre.

The proposed Development delivers a site net gain of +1.13 habitat units, equivalent to a net gain of +18.74%. There is no change in the value of the Site's hedgerows (2.07 hedgerow units).

Planting for Biodiversity.

Woodland Mixture is a mixture of woodland wildflowers and grasses that will bloom in spring and early summer. Woodland wildflowers require some shade to thrive. So, use this mixture in established woods or young woodland as the canopy begins to close in.

Hedgerow Mixture EH1 contains wildflowers and grasses tolerant of semi-shade and is suitable for sowing beneath newly planted or established hedges and on woodland edges, rides, and glades.

Meadow mixture is suitable species adapted to growing on soils with high clay content. Clay soils are generally mildly acid to neutral, prone to waterlogging, sticky and heavy when wet, and hard to crumble when dry.

Green Roof mixture of annual wildflower suitable for sowing onto engineered substrates of green roof schemes.

A total of 12 credits can be awarded at this stage, with a possible additional credit available depending on meeting the exemplary credit and managing the risks and opportunities for the project (LE 02).

Landscape Ecological Management Plan

Applied Ecology provides advice for protecting the existing ecology during construction, installing the ecological enhancements and ongoing management of the side by school groundskeepers.

Please set out the current and proposed space heating demands

Current Energy Data.

The refurbishment of the swimming pool was completed in September 2021. The works included installing four 150kW high-efficiency condensing boilers providing 600kW of heat. These boilers are sized to operate efficiently as the building load fluctuates. The boilers are designed to heat the swimming pool from cold over five days. Once the pool is heated, the boilers top up only the lost heat when the swimming pool water is refreshed.

When swimming is in operation, the boiler provides heat to the air handling unit, maintaining pool hall air temperature a few degrees higher than pool water temperature. When the pool is not in use and is covered, the ventilation plant reduces the pool hall temperature and ventilation, operating in recirculation mode with almost no heat input.

Over the winter, the contractor has been changing the heating and ventilation systems. Currently, there is no whole year of energy data available. The data will come available when the project progress of the whole design Sports hall 1 has a separate heating system from the pool hall but shares the same electricity and gas supplies. The gas and electricity supplies are not sub-metered, and data is linked to the swimming pool energy use. It has not possible to separate the energy use between the swimming and sports hall 1

Proposed Energy Data.

Although the proposed building design and layout, the details and selection of heating, ventilation plant and lighting are not yet determined, this data will become available as part of the detailed design process and will be required as part of the BREEAM energy and metering credits.

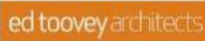
Appendix C.

BREEAM Energy Workshop and BREAM Approve Professional

eight associates Sustainability Consultants 57a Great Suffolk Street London, SE1 0BB +44 (0) 20 7043 0418 www.eightassociates.co.uk info@eightassociates.co.uk Meeting Notes BREEAM AP Meeting 1 Highgate School MSC	Meeting Notes BREEAM AP Meeting 1 Highgate School MSC
Project details Project name: Highgate School MSC BREEAM scheme: New Construction 2018 Building type: Education	Ene 01 – Operational Energy Design Design review of the maintenance is in process. Principles of how building will be controlled will feed into. Placement of plant – choice of natural ventilation vs mechanical ventilation. Has replacement been considered? Steve – phases over years. Plant has been based on phases and need of those. Prefer it that way because it means that one building is not reliant on a single plant. Some might consider this to be doubling up on plant but it’s more effective for how the school works and it’s the only way the school works. Ed – the phases have made it easily accessible. Some items are modular so components can be replaced relatively easily. Whole plant on roof can be easily replaced. Construction Some building have been chosen to be retained. In terms of life cycle of the site are seen to be in a sensible location and are still seen to be fit for purpose. The buildings being demolished are because the land could be put to better use or are end-of-life buildings. Some building materials will be reused, for example reuse of masonry or crushing of aggregate. Having a project manager on board does help because of past knowledge. Testing & Commissioning The school insists on having a services coordinator on the contractor’s side. Will include in the specification that they need to be accredited. Clerk of works could be appointed for a few years to patrol and ensure that all building works across the site are quality controlled in terms of commissioning. Lighting levels will be fitted and tested according to end user requirements. Handover Design team will review design up until PC. Snagging etc. Ask contractor to demonstrate building to end users. Arrange training schedule and programme where end user is given opportunity to be shown around the building – soft landing package for example. Intention to standardise all of the O&M manuals to make it easy to find the right info. Design team will allow for time for client to ask questions. Operation Seasonal commissioning will be undertaken for the building. Building User Guide will be developed between Justin & Steven. There will be a BMS in place. Post Occupancy Evaluation is being considered at the end of each phase to help to inform the next phase. Usage patterns There are after-school clubs and mostly daytime usage. Open 16.5 hours per week day, 12 hours on weekends. Usage doesn’t change much depending on holidays or term time. Flood risk has been considered. Attenuation has been designed. Roof lights been kept to a reasonable size. Almost all rooms are naturally lit. Gutters & downpipes have been sized appropriately. Triple glazed roof lights to minimise overheating risk. Natural ventilation to help minimise the overheating risk. High and low level air paths have also been designed in.
Meeting details Date: 14.08.2019 Location: Field House, Highgate School	
Attendees Adrian Holmes Danny Campodifiori Francesca Harris Ed Toovey Stephen Freeth Justin Jeanne Davidson Peter Deer Associates Peter Deer Associates Peter Deer Associates Ed Toovey Architects Highgate School Highgate School Eight Associates (BREEAM AP)	
Meeting notes Man 01 - End use has been considered – meetings for months so far with Ed & Steven. Designs have been put forward and redesigned. All pupils have been consulted and input have been taken into account. Learner pools were discussed for example. Squash courts were looked at by the school but it was deemed not commercially viable so not included. Fives weren’t in the original plan. Possible commercial gym area was added in to utilise the space and generate income. Additional room added. Have looked at potentially retaining buildings instead of demolishing. Ed to send through the document they have already. Man 01 – no single brief but there is a space document. D&A statement. Design team to update Project Directory to include roles. Discussed that there is a plan in the programme to allow stakeholders to be able to review the design? Services, finishes etc. Following planning consent a series of workshops will be set up to clarify the use of the space and fit out etc. Maintenance and landscape people will be involved. Hea 06 - A lot of meetings on CCTV and access control have taken place. Cameras, corridors, entrances, exits, control doors. Met police will be consulted. The D&A statement has a section that deals with security. JD to ask BRE about thermographic survey on part refurb part new build. AH to send BRUKL to JD when complete work out Ene 01 score.	

Appendix D. Secure by Design Statement

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Site and Site boundaries

This is an existing site for indoor sports, closely related to the adjacent all-weather external sports pitches to the south, the outdoor pitches on Senior Field to the west, and the practice pitches to the east.



Location plan of the MSC sports Centre – refer to planning drawings for full details

The whole Highgate School campus on the east side of Bishopswood Road, which also includes the RMC building [currently planned for re-development with the masterplan] on the south boundary and a small store building [formerly an indoor rifle range], is bounded and made secure by perimeter painted steel railings of traditional design, approximately 1.6 – 1.8 metres high [varies with the ground]. The boundary with the residential properties to east and south are formed with timber close boarded paling fencing of 1.8 – 2 metre height. In this way the School site is very clearly defined both as a School site and a sports site, and provided with appropriate security, with limited points of access, forming a safe general area for pupils to engage in sports. It is not considered necessary in the local context for more secure or taller fencing railings.

There are no public footpaths across the site.

There are limited numbers of cycle parking stands on site at present, but this project will substantially increase the amount of secure covered cycle parking, principally on the north end of the site, in an area of the grounds that will be overlooked by the adjacent classroom and offices teaching wing.

Pupils taking part in games on outdoor pitches are always supervised by members of staff. The use of the all-weather pitches can extend beyond normal School hours.

There is a crossing of Bishopswood Road for accessing between this site and the west site, which has Senior Field, the Mills Centre, Pre-Preparatory School and the main School Dining hall. At key times of day this crossing is manned by a member of the School security team.

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View of the MSC sports centre site from south, Bishopswood Road on the left behind railings

On the north side the site is bounded by Broadlands Road, and the rear gardens of residential properties along that street.

On the south side it is bounded by residential properties, and on the east side by another School, Saint Michael's Church of England Primary School and their amenity spaces.

The closest residential property to the MSC is no.27 Broadlands, whose property and rear garden abuts the east side of the site.



View of the MSC sports centre site vehicle entry gates at south end

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Access gates are controlled by magnetic locks and coded electronic entry devices. There are both pedestrian and vehicular gates. At the south end of the whole site there is access for service vehicles and fire brigade, with only a small area of service vehicle parking.

There are CCTV cameras covering the site and buildings linked back to the School’s security team on the School network.

The whole site is in a Conservation Area, there are no listed buildings, and there is a large open area with the all-weather pitch and environs which is part of designated Metropolitan Open Land.

Existing building

The existing MSC sports centre building, comprising the sports and pool interlinked complexes, are generally accessed from a single point of entry at the south end off Bishopswood Road, via a lobby and reception, which is always manned. The School wish to retain the concept of a single main secure point of entry for the new project.

There is a secondary entrance/exit at the north end, next to the swimming pool, that is more rarely used but is available, particularly for access just to the pool facilities, and this is arrived at via a gate in the railings.

Community Uses

There are community public uses for the outdoor pitches, as well as the indoor sports centre, including other schools and sports clubs. In the holidays there are also holiday camps and other activities. The MSC sports centre is currently available to the community as a private sports club with membership. The options for public use are noted as follows on the Camden Cindex website:

Private school facilities available to the public. Term-time sports activities for children aged 5-14. School holiday courses include multi-activity, football, cricket, tennis and dance. Facilities for adults include squash, fitness suite and tennis (courts available), 25m x 12.5m swimming pool. Children's parties for 5-15 year olds (maximum 25 children) available at weekends including a variety of sports options and games and swimming sessions. Bouncy castle party available for children aged 5-7 years. Swimming club.

New project building design and security arrangements

The new extensions will create a larger building with more varied sports facilities, including a second sports hall, which will also be used for other School events, parent evenings, examinations, and assemblies.

The principle of a single secure point of access at the south end is to be maintained, with a larger and more open entrance and foyer fronting on to the all-weather pitches. Once inside the foyer via a

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draught lobby, the area is immediately controlled by the main Sports Centre reception desk, which will be manned at all times during regular operational hours. The desk will be open within the space to create a friendly and welcoming impression for pupils and visitors, but also to improve visibility. It is anticipated that turnstiles will be used to control and monitor access within the building – these are provided also at the west entrance next to the second hall. Turnstiles and entry doors would all be linked to the building fire alarm and detection system and default to open in the event of a fire for emergency egress.

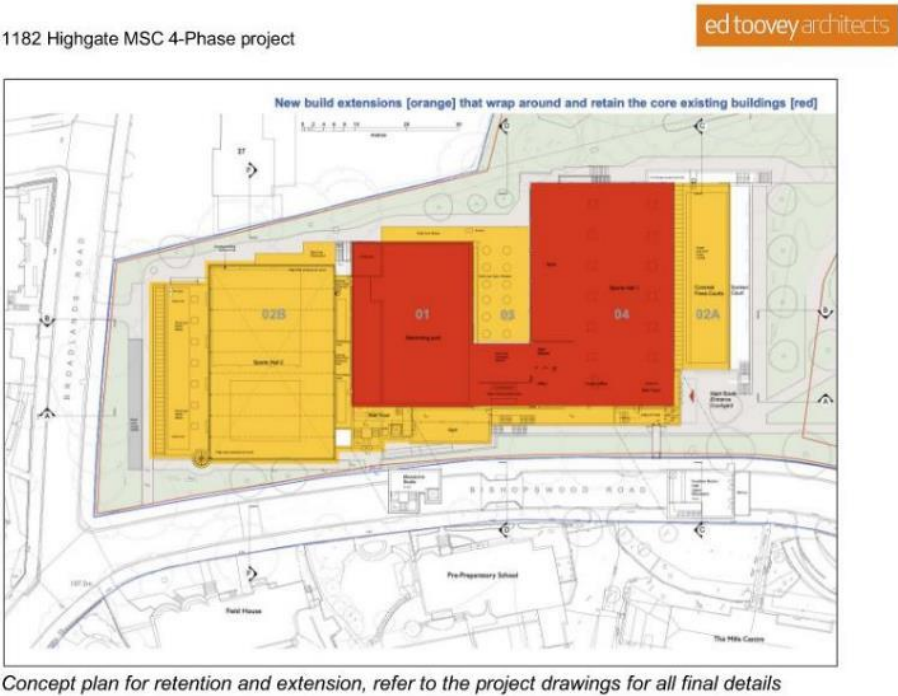
As a result of the proposed extensions, new lifts will allow complete accessibility for disabled users to all areas of the building, which is not currently wheelchair accessible.

Generally during the School day the main doors will be openable, the entry doors being on automatic electric opening systems for disabled and Part M access. After School hours it is anticipated that the main doors at both entrances doors will have access security control, operated by coded entry devices with magnetic closing locks. An option being investigated is to have the entry systems operated by pupil and staff cards, that will serve several other functions in the School also.

However because the second sports hall may be used for diverse functions, including community use on occasions, a second entrance has been provided in close proximity to the second hall – such that it will be possible to allow functions to take place in this part of the buildings while the rest is in other use.

In addition, there will be a separate street entrance to access the cafeteria on the upper floor, which is intended as much for parents as pupils. This route will be ‘gated’ from the street, with railings preventing access to the main grounds, and the stairs up will be visible from the main reception.

The building entrances will avoid recessed areas as much as possible, so that all areas can be easily included under surveillance, whether by CCTV or visual. The recess on the east side fire exit stair is unavoidable due to the geometry of locating the stair to the basement floor, but this space will be covered by CCTV.



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- Create a new outdoor sports area with an unique and elegant oval-shaped amphitheatre that will not only provide seating around the pitch, but also acts a barrier and flood water storage device to prevent future flooding events;
- Introduce new tree planting; o Provide accessible and safe access to the sports pitches for students and visitors, and connect with other areas of the School;
- Utilise a no-dig construction methodology to prevent damage to tree roots where possible;
- Minimise any impacts on the most valuable, existing trees around the site.

There are existing substantial mature trees around the site perimeter, between the MSC and the Orchard site, and all round and to the east of the Orchard site, where there is a small natural wood.

The proposed landscape around the MSC will provide paths that will connect all the new main entrances, as well as service entrances to the north-east of the buildings. Existing paths around the all-weather pitches will be linked into the proposal, to create intuitive routes around the site.

Generous planting beds along paths and around the new building will soften the space and enhance its 'gardenesque' qualities. A new paved courtyard will be created at the building entrance at the southern corner, with a cantilevered timber seat for waiting and an ornamental tree as a focal point, creating informal enclosure from the street. There will be no loose gravel in the paths, all will be bound.

A paved viewing terrace above the new fives courts will be backed by a line of new trees to create shelter and frame views of the building, with planting and seating beneath. A terrace with seating in front of the fives courts has also been designed to host viewers at the lower court level.

All "street" outdoor furniture, such as seating and bins, is appropriately situate, fixed in place, and of robust long-lasting construction.

External lighting will be designed for paths and building perimeters in association with the landscape plan, particularly at entrances and access points. Lighting will be coordinated with CCTV installations, which are monitored by the School in-house security team. Lighting will be designed to meet movement and emergency access criteria, with a balance between good illumination and sensitivity to neighbouring residential properties and the setting of the Conservation Area, with light pollution to neighbours minimised or avoided.

Meeting spaces

The designed meeting spaces are associated with the playing pitches and the main entrances, such as at the south main entry and the terrace along the frontage of the new Fives Courts. All of these are in areas that can be well controlled and supervised.

Although pupil access is not restricted around the other perimeter areas of the MSC, on the west, north and east, pupils are not encouraged to go in those areas without supervision by staff.

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Servicing

The east side in particular is largely a service access part of the site, with a new gate being provided off Broadlands for service vehicles including for maintenance, landscaping, refuse collection by the School's own vehicle to relay to the central refuse stores.

The new waste storage includes for recycling in keeping with the School's environmental policies, all in lockable enclosures.

Utility meters are all to be located inside plant rooms, accessed only by authorised persons.

Car parking & Cycle storage

There is no car, moped, motorbike or vehicle parking on the MSC part of the site.

The project is providing a significant number of new cycle store spaces. There are some open stands provided at the main entrance, but the majority of the provision is at the north end of the site, where secure covered open stands are provided, with adjacent lighting.

Building components and materials

Wall construction is generally in solid masonry cavity wall construction, with external clay facing bricks or Portland stone facings.

Windows are to be aluminium or aluminium/timber composite windows, or curtain walling systems, with double glazed glass units. The glazing in will include security glazing tape, dedicated security sealant or gasket and a secure mechanical fixing system – in general all glass units will include safety glass, laminated and toughened in compliance with Part N and beyond – this will apply to glass at all levels, as the sports activities will also require safety glass.

Roofs are constructed with a base which might be CLT panels or profiled metal sheeting, fixed to the main structural frame, and finished with rigid insulation and bituminous flat roof weatherproofing systems. In many cases this will be combined with green roof systems including extensive roof build-ups and drainage layer.

Roof apertures will be protected by roof lights certificated to LPS 1175 Security Rating 1 or STS 202 Burglary Resistance, securely fixed in accordance with the manufacturer's specifications. It is anticipated that the rooflight glazing will be double glazed glass units with safety glass as above. There are no suntubes in the design.

The whole project will be Part M compliant in accordance with the Equality Act.

External door apertures will be protected and will meet one of the following minimum standards when the building is unoccupied:

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- PAS 24:2012
- LPS 1175 Issue 7 SR2
- STS 201 or STS 202 BR2

All external doors will be in aluminium, either entrance doors, plantroom doors, and louvred plant doors, and where glazed will include safety and secure glazing units as above in compliance with Part N and certified to:

- PAS 24:2012
- LPS 1175
- STS 202

BS 6375 will be referred to for the classifications to ensure that doorsets will adequately meet the demand placed upon them.

External doorsets and windows will be certificated by one of the following UKAS accredited certification bodies (Note 63.5):

- BM Trada Certification
- British Board of Agrément
- British Standards Institute
- Loss Prevention Certification Board (part of the Building Research Establishment)
- Exova Certisecure Scheme
- ER Certification
- UL International UK
- Buildcheck

Intruder Alarm systems

Intruder alarm systems, with contact devices at all opening doors and windows, will be provided – these are to be suitably designed, fit for purpose, monitored, and comply with the requirements of the ACPO Security Systems Policy.

Appendix E. Project Roles and Execution Plan

Roles	Responsibility	Contribution
Client	Set the design briefs, appoint designers and contractors, set budgets, and review design and construction.	Develop the design brief with stakeholders and appoint a design team. Review the designs and appoint the main contractor. The monitor construction process,
Project management	Advise on the design and construction, set project management tasks, and define delivery timescales. Review design packages and advise the client through the design and construction process	
BREEA Assessor and separated Approved Professional	The BREEAM assessor's role is to record and quantify the BREEAM Credits. Approved BREEAM professional is to influence and advise on achieving and maximising the BREEAM Credits. The approved profession I should help the design team to demonstrate how the BREEAM credits are to be achieved.	
Architect	Project manage the sub-designers to achieve the client design brief to design the building and main plan. The architect has a role to selected sustainable building materials. Research and promote construction methods designed to reduce construction waste. The design reduces energy consumption. The design has adequate space allowance for installation and maintenance of the building service plant.	Provide sustainable procure brief, List and quantities of sustainable materials. Consider maintenance and healthy safety issue as a priority within the design. Select low water using sanitary wear. Design internal daylight. Liaise with school and secure by design adviser. Reuse and recycled demolition material Specify sustainable sources of timber products Specify low VOC paints glues and material, for example, floor covering, fabrics, furniture etc. Provide tender drawings and documentation for the contractor to develop the design for installation.
Structural Engineer	Work with the architect to source and use sustainable building materials. Research on how to reuse or recycle building materials within the design. Design the building structure for disassembling and potential reuse. Work with building services engineers on the location of the heavy plant,	Provide tender drawings and documentation for the contractor to develop the design for installation
Civil engineer	Advise on the demolition and Ground Works Design of the underground foul and rainwater drainage. Works with the building service designers on the location and of the underground utilities Provide advice for the reuse or recycling of demolition material Considered how the material can be stored and reused on-site rather than transported to another site. Provide sustainable drainage.	Provide tender drawings and documentation for the contractor to develop the design for installation
Building services	Design the mechanical, electrical, ventilation and above-ground drainage design. Review the proposed plant and look at the option to reduce embodied energy. Review option to reuse and recycle building services plant. Select a building services plant that is designed to be disassembled.	Set up a meeting with school maintenance engineers to review the design and layout of the proposed scheme with to the operation and maintenance of the design of the service. Undertake design review the regard to plant maintenance and potential replacement. Provide tender drawings and documentation for the contractor to develop the design for installation
Environmental Engineer	Undertake the building compliance and operational energy modelling. Maintain the Life Cycle Assessment model during the design process Review building products with low embodied Carbon.	
Landscape and ecology	Undertake the landscape design in the school's brief. Include ecological features within the landscape design. Provide ecological advice to the main contractor on retaining ecological features within and neighbouring construction sites. Undertake regular site visits about the progress of the Landscape design. The ecologist will inspect and advise the main contractor on ensuring more giant trees and plants survive the construction process. Landscape design to include reused or recycled material plants The ecologist undertakes a post-construction visit to advise the school on maintaining the ecological features.	Provide tender drawings and documentation for the contractor to develop the design for installation. Review the design with ground-keeping staff. Provide list quantities of building material. Provide a list of plants and items that can be locally grown. Work with the ground staff to determine if the school can grow plants. Provide advice to the ground staff for maintenance and upkeep.

Roles	Responsibility	Contribution
Quantity surveyor	Review and update the cost plan as the design develops, Contribute to project management process. Review the design and advise how construction costs may be reduced or where operational energy saving may be achieved at an increased capital cost. Contribute towards the selection of the contractor. Undertake regular site valuation and report to the client and design team Work with the design team to help reduce: operational energy consumption, embodied Carbon, and construction waste.	Provide regularly updated cost plans
Transport	Work with the school to develop the BREEAM Compliant Travel Plan. Review contractor proposal and vehicle movement. During the brief preparation, the design team consults with the local authority (LA) on the state of the local cycling network and publicly accessible pedestrian routes to focus on whichever the LA deems most relevant to the project and how to improve it. Agree and implement one proposition chosen with the local authority. The proposition supported by the development is additional to existing local plans and significantly impacts the local cycling network or pedestrian routes open to the public.	Contribute towards School BREEAM Compliant
Stake Holder		
Physical Education staff	Provide input into the design brief. Review the room layouts and spatial allocation, Provide written design comment before tender	Provide written design comment before tender
Building Maintenance	Review the Architectural and services design regarding the operation and maintenance of the building	Before tender, provide a written review and comment on the building services design and the drawings. Provided input and contributed to the commissioning of all buildings system, Building systems include a green roof, building fabric, building services, sanitary systems, Provide written design comment before tender
Ground keepers	Provide input into the Landscape design. Provide input into improving the site's biodiversity. Review the landscape design, Comment on the design	Provide input into improving the site's biodiversity. Provide written design comment on the Landscape design before tender
Security	Review the design for building security	Provide written design comment before tender
Construction		
Demolition contractor	Demolition plan, Vehicle movement To update the LCA model Record waste type from the site	The material breaks down (Quantities) of demolition material taken from the site, including any earth movement. (This is not a waste of documents) Weekly record of Waste material taken from the site, Diesel fuel use, Generator (kWh), mains electricity, Fuel Use, and Water use.
Main Contractor	Develop the tender design for construction, Employ a BREEAM-approved professional as part of the design team. Continue to update the LCA Model with the purchase of building materials Sustainable procure building materials Employ Local people and purchase local suppliers Record the site energy use. Consider the offsite construction process where this could be delivered to the site. Under considering the Contractor scheme's best practice	The material breaks down (Quantities) of construction material taken from the site, including any earth movement. (This is not a waste of documents) Weekly record of Waste material taken from the site, Diesel fuel use, Generator (kWh), mains electricity, Fuel Use, and Water use. Provide construct site waste records. Provide Sustainable documentation for all building materials Provide FSC certificates for all timber products Provide Data Sheet with evidence of Low VOC compounds for all paints, glues, fillers, and other building products ETC

Roles	Responsibility	Contribution
Groundworks	Undertake earth movement and installation of the below-ground elements. Construction underground drainage, rainwater drainage Provision of the installation Commitment to employ or train an operative during the works	The material breaks down (Quantities) of groundworks material is taken from the site, including any earth movement. (This is not a waste of documents) record of: Concrete and cement, building materials, Waste material is taken from the site, Diesel fuel use, Generator (kWh), mains electricity, Fuel Use, and Water use.
Structure, brickwork, cladding, contractors	Develop the structural design for construction Provide data quantities of building material used on-site to update the LCA model. Commitment to employ or train an operative during the works	The material breaks down (Quantities) of groundworks material is taken from the site, including any earth movement. (This is not a waste of documents) Weekly record of Waste material taken from the site, Diesel fuel use, Generator (kWh), mains electricity, Fuel Use, and Water use.
Mechanical and Electrical Contractor	Develop the design of the service for construction Provide data quantities of building material used on-site to update the LCA model. Commitment to employ or train an operative during the works	Provide material breakdown and data sheets Provide Embodied Carbon Certificates for all plant items. Provide material quantity list for LCA model Provide Manufactures installation and operation manuals for inclusion in the O&M Manuals Set of As-built drawings
Internal finishes	Contractor to provide VOC certificates for all paint, glues, fillers etc., used on site. Were Possible for a contractor to use a local wholesaler? The contractor should include consider employing an apprentice.	Provide Embodied Carbon Certificates and FSC Certificated of all finished
Landscape	Sustainable procure locally grown plants Use recycled materials Record water, energy, and waste	Provide procurement details and certificates Embodied Carbon certificates for building material Provide evidence for the use of recycled material