JULY 2022

Sustainability & Energy Statement

NCP Heathrow Flightpath

Iceni Projects Limited on behalf of
Heathrow NCP Property Limited

July 2022

ICENI PROJECTS LIMITED
ON BEHALF OF HEATHROW
NCP PROPERTY LIMITED

Sustainability & Energy Statement
NCP HEATHROW FLIGHTPATH

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1. EXECUTIVE SUMMARY

1.1 Iceni Projects Ltd has been commissioned by Heathrow NCP Property Limited to produce a Sustainability & Energy Statement to support the proposed redevelopment of the NCP Heathrow Flightpath, Bath Road, Heathrow, UB7 0DU.

1.2 The application proposes the redevelopment of the site for industrial, storage or distribution and/or light industrial uses, with ancillary office space, car parking and landscaping.

1.3 Sustainability is a core consideration of the application and has been incorporated from the project outset. Resource and water efficiency have been maximised, whilst the production of waste and pollution is to be minimised, thus ensuring the impact of the proposals on its immediate surroundings and the environment as a whole is minimised.

1.4 By designing to rigorous energy standards and employing air source heat pump (ASHP) technology to serve the space heating and cooling demand of the proposals, the application will respond directly to the Climate Emergency declared by the Council in January 2020. These measures combine to provide a minimum carbon dioxide emissions saving of 61%, compared to the Part L baseline, significantly exceeding the requirements of the London Borough of Hillingdon Council.

1.5 Consideration has been given to the Hillingdon Local Plan Part 1: Strategic Policies in the overall formulation of this strategy, aiming to minimise the environmental impact of the proposed development during construction and operation, and to ensure the development is constructed to rigorous sustainability standards.

1.6 The proposed strategy has been based around the objectives of the Local Plan strategic objectives 8, 10, 11 and 13, and policy EM1. In summary, based on this strategy, the proposed development:

- will aim to achieve BREEAM certification, targeting a rating of ‘Excellent’;
- makes efficient use of land;
- will incorporate low-impact materials, according to the BRE Green Guide to Specification;
- will incorporate measures to improve site biodiversity, including native planting;
- will minimise waste production during construction and maximise the proportion of waste to be diverted from landfill;
- will minimise energy demand through the specification of low U-values and low air permeability to reduce heat loss;

- will utilise air source heat pump (ASHP) technology to serve the space heating and cooling demand of the office spaces; and

- will achieve a minimum 61% reduction in CO_2 emissions, following the Energy Hierarchy methodology, with the remaining 881 tonnes of CO_2 pe annum of non-domestic emissions from the development to be offset through a cash-in-lieu contribution.

1.7 Overall, the proposals constitute sustainable development in accordance with national and local policy requirements and will provide a development that seeks to promote these principles in operation.

2. INTRODUCTION

2.1 Iceni Projects Ltd has been commissioned by Heathrow NCP Property Limited to produce a Sustainability & Energy Statement to support the application for the proposed redevelopment of the of the NCP Heathrow Flightpath, Bath Road, Heathrow, UB7 0DU.

Report Objective

2.2 This document details the sustainable design and construction measures adopted by the proposed development and gives an overview of the design proposals that will ensure the development operates in a sustainable manner over the lifespan of the scheme. The Sustainability & Energy Statement report headlines will provide a framework for the project team to operate consistently within sustainability guidelines set out by the London Borough of Hillingdon Council.

2.3 The report is structured to meet these guidelines as follows:

- Section 3 discusses the planning context and policies which are relevant to sustainability;
- Section 4 discusses the development response to the policy drivers for sustainability;
- Section 5 sets out the development's energy strategy to minimise CO_2 emissions; and
- Section 6 summarises the development's design response.

Site and Surroundings

2.4 The application site (Appendix A1) is located within the London Borough of Hillingdon, to the north of Heathrow Airport. The site is bound by the A4 (Bath Road) to the south, and the M4 spur – Tunnel Road West to the east. A former Metropolitan Police facility, which is currently vacant, is located to the north of the site, whilst residential dwellings are located on Sipson Way to the west. a small parade of shops is located to the north west of the site.

2.5 The application site itself comprises approximately 1.6 ha of existing brownfield land. It is currently under-utilised as a grade level car park, and was last used by NCP for this use in August 2021. The approximate location and site boundary of the site are shown in Figure 2.1 below.

Figure 2.1 The site

Approximate site boundary

The Proposed Development

2.6 The description of development is as follows:

> *"Demolition of existing car park and redevelopment for industrial (Use Class B2); storage or distribution (Use Class B8); and/or light industrial (Use Class E(g)(iii)) purposes, with ancillary office space, landscaping, car parking, servicing and access arrangements"*

2.7 The floorspace (Gross Internal Areas; GIA) to be provided as part of the proposed development is as follows:

- Unit 110: 1,772 sqm
- Unit 120: 2,256 sqm
- Unit 130: 2,725 sqm
- Unit 140: 1,609 sqm
- **Total: 8,362 sqm**

2.8 The images below show the plans and elevations of the scheme.

Figure 1.1 Proposed site layout

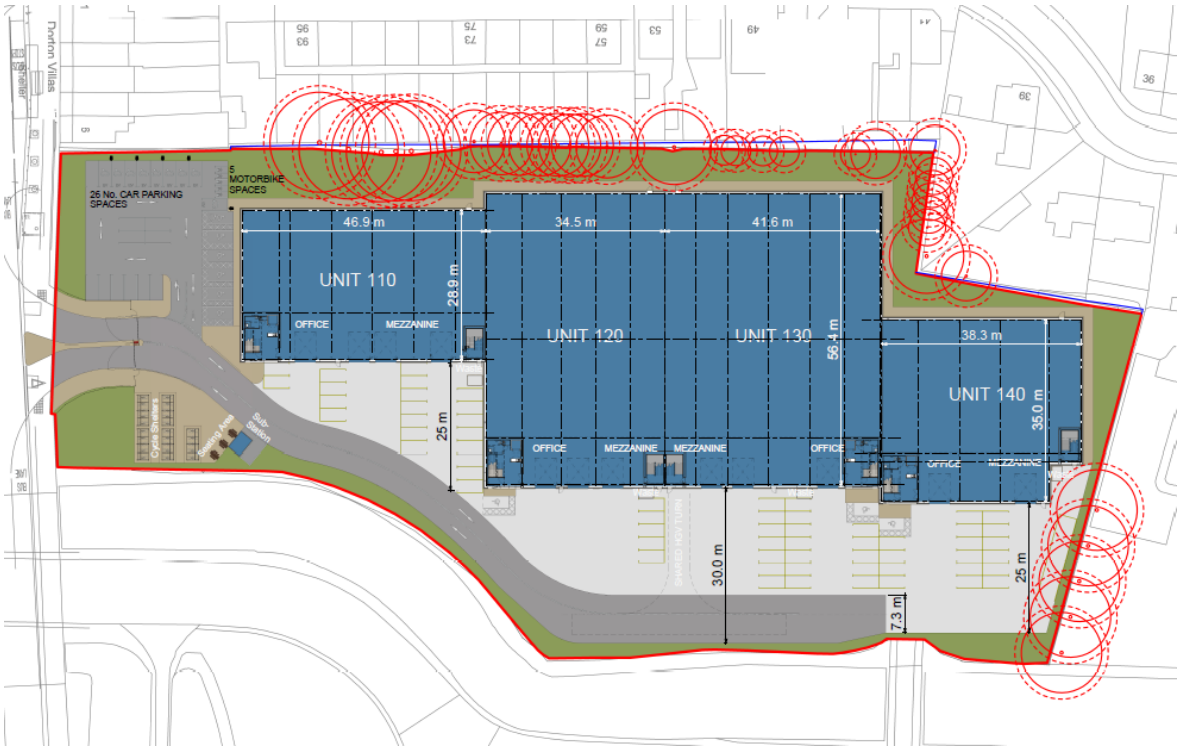


Figure 1.2 Proposed elevations – Unit 110

Figure 1.3 Proposed elevations – Unit 120

Figure 1.4 Proposed elevations – Unit 130

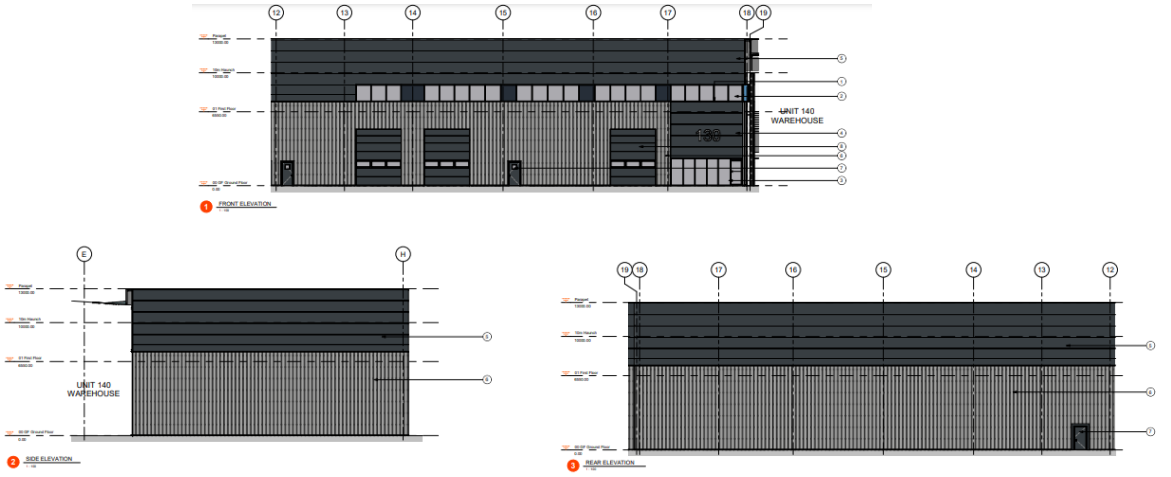
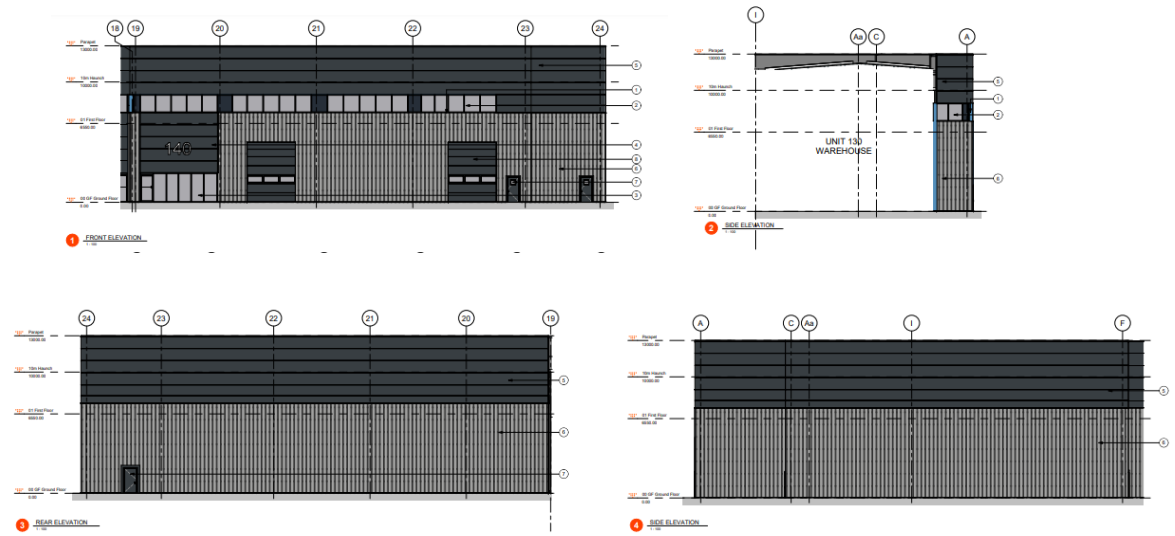


Figure 1.5 Proposed elevations – Unit 140



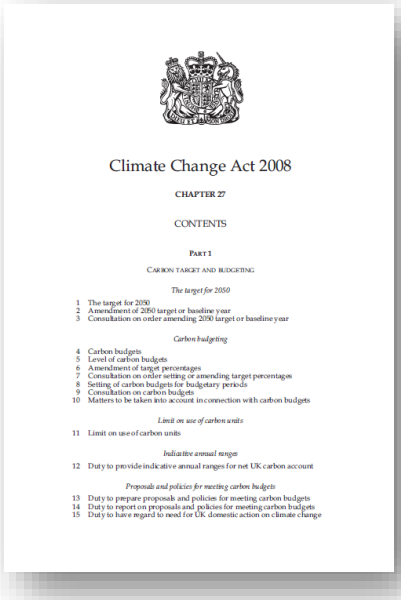
3. PLANNING AND REGULATORY CONTEXT

3.1 Built environment sustainability is incorporated within policy and regulation at a national and local level, as set out below.

National

Climate Change Act 2008

3.2 On 26th November 2008, the UK Government published the Climate Change Act 2008; the world's first long-term legally binding framework to mitigate against climate change. Within this framework, the Act sets legally binding targets to increase greenhouse gas emission reductions through action in the UK and abroad from the 60% target set out in the Energy White Paper, to 80% by 2050.



Climate Change Act 2008

CHAPTER 27

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PART 1

CARBON TARGET AND BUDGETING

The target for 2050

1 The target for 2050
2 Amendment of 2050 target or baseline year
3 Consultation on order amending 2050 target or baseline year

Carbon budgeting

4 Carbon budgets
5 Level of carbon budgets
6 Amendment of target percentages
7 Consultation on order setting or amending target percentages
8 Setting of carbon budgets for budgetary periods
9 Consultation on carbon budgets
10 Matters to be taken into account in connection with carbon budgets

Limit on use of carbon units

11 Limit on use of carbon units

Indicative annual ranges

12 Duty to provide indicative annual ranges for net UK carbon account

Proposals and policies for meeting carbon budgets

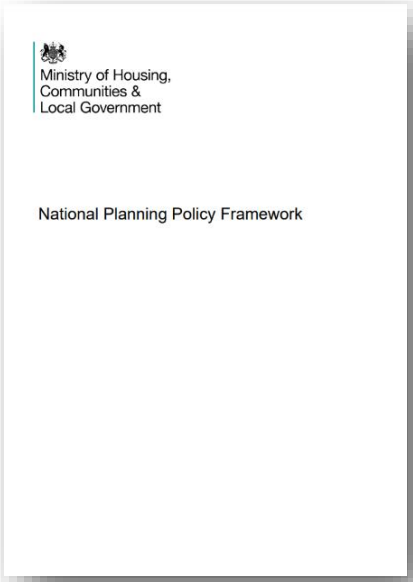
13 Duty to prepare proposals and policies for meeting carbon budgets
14 Duty to report on proposals and policies for meeting carbon budgets
15 Duty to have regard to need for UK domestic action on climate change

3.3 As required under Section 34 of the Climate Change Act, the Sixth Annual Carbon Budget was accepted by the Government in April 2021. This sets out a budget for UK emissions for the period 2033 – 2037.

3.4 Following a commitment in June 2019, the Climate Change Act has been amended to target net zero carbon emissions by 2050.

National Planning Policy Framework

3.5 The Ministry of Housing, Communities & Local Government determines national policies on different aspects of planning and the rules that govern the operation of the system. Accordingly, the National Planning Policy Framework (NPPF), which came into force in March 2012 and was updated in February 2019, aims to strengthen local decision making. Additional updates have since been made through the latter half of 2020 and in January and July 2021 to reflect changes related to use classes, permitted development rights, the calculation of housing need, and requirements to achieve beauty alongside sustainability.



Ministry of Housing, Communities & Local Government

National Planning Policy Framework

3.6 Paragraphs 10 and 11 of the NPPF confirm that at the heart of this document is a "*presumption in favour of sustainable development*", and that development proposals that accord with an up-to-date development plan should be approved without delay.

3.7 Paragraph 7 states that the purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

3.8 Achieving sustainable development means that the planning system has three overarching activities, which are interdependent and need to be pursued in mutually supportive ways, so that opportunities can be taken to secure net gains across each of the different objectives:

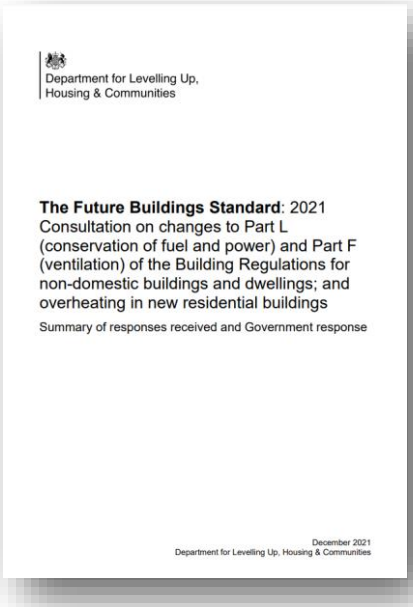
- **An Economic Role –** ensuring the provision of land and infrastructure needed to help build a *strong, responsive and competitive economy.*

- **A Social Role –** supplying the required amount of housing while at the same time ensuring and building *strong, vibrant and healthy communities.* Ensuring that the built environment is sited around accessible local services which help support a community's *health, social and cultural well-being.*

- **An Environmental Role –** ensuring development contributes to the protection and enhancement of the *natural, built and historic environment* through the improvement of biodiversity, minimising the use of natural resources and production of pollution / waste, and guaranteeing sufficient adaptation to climate change.

Future Buildings Standard

3.9 On 19th January 2021, the government announced the future introduction of the Future Buildings Standard. The Standard will deliver new non-domestic buildings that are zero-carbon ready from 2025 onward, which use low-carbon heat, and which have the best fabric standards possible. As the electricity grid continues to decarbonise, homes built to the Standard will become net zero carbon over time, with no need for further energy efficiency retrofit work as they will rely on fossil fuels for heating and hot water.


Department for Levelling Up, Housing & Communities

The Future Buildings Standard: 2021 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for non-domestic buildings and dwellings; and overheating in new residential buildings

Summary of responses received and Government response

December 2021
Department for Levelling Up, Housing & Communities

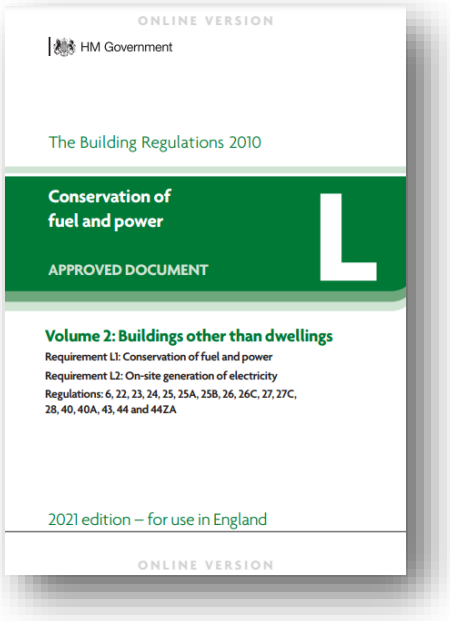
3.10 This Standard is expected to build on the Prime Minister's Clean Growth Grand Challenge mission, which aims to at least halve the energy usage of new buildings by 2030. It also looks to halve the costs of renovating existing buildings to achieve a similar standard of energy efficiency as new buildings, whilst improving their quality and safety.

Part L:2021 of the Building Regulations

3.11 Part L of the Building Regulations relates to the conservation of fuel and power, and applies to both new and existing buildings. The current edition covers the energy efficiency requirements of the building regulations as set out in Part L of Schedule 1 to the Building Regulations. Technical guidance is contained in four Part L Approved Documents and two building services compliance guides.

3.12 The documents of relevance to this scheme include:

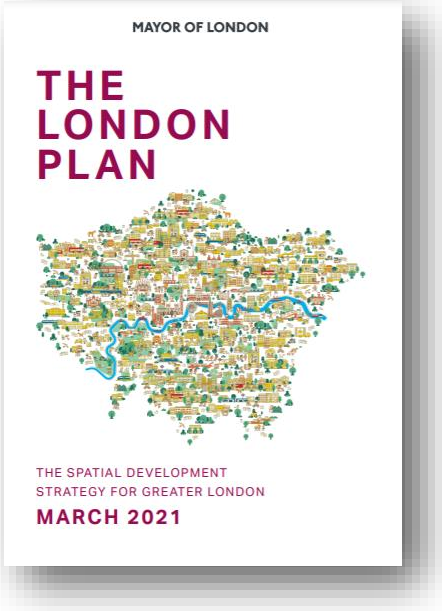
- **Approved Document L Volume 2: Buildings other than dwellings.** This provides the methodology for new build, non-domestic buildings to meet current energy efficiency standards, including backstop U-values, carbon dioxide emissions calculations and minimising the risk of overheating. Carbon dioxide emissions reductions are prescribed for 'regulated' emissions only, and relate to heating, hot water, lighting, auxiliary and cooling (where specified). Emissions from other equipment (computers, for example) are considered to be unregulated emissions, and are excluded from the analysis.



Regional

3.13 Within Greater London, key sustainable development principles for economic, environmental and social improvement are set out below:

The London Plan (March 2021)



3.14 The London Plan is the overall strategic plan for London and includes policies for sustainable development and energy within Chapter 9 (London's response to climate change). Key policies of relevance to this scheme are as follows:

- **Policy SI2 Minimising Greenhouse Gas Emissions.** This states that major development proposals should be net zero-carbon, by reducing greenhouse gas emissions in operation and minimising both annual and park energy demand in accordance with the following energy hierarchy:

    1. Be lean: use less energy
    2. Be clean: supply energy efficiently
    3. Be green: use renewable energy
    4. Be seen: monitor, verify and report on energy performance

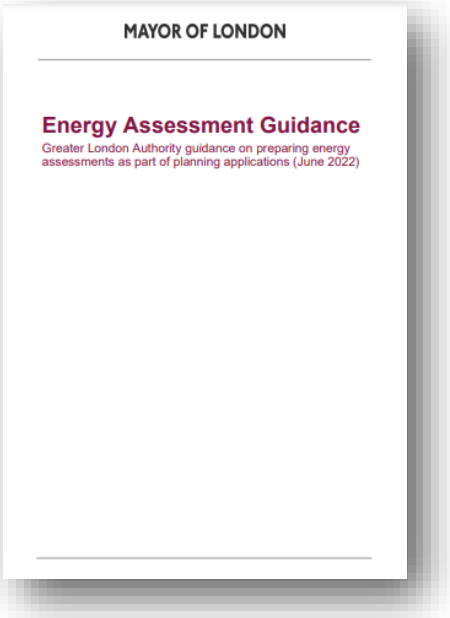
- **Policy SI3 Energy Infrastructure.** This policy recognises that combined heat and power installations can have negative effects on London's air quality and shifts the focus of decentralised energy networks to the use of waste or secondary heat sources, where available. The policy also recognises that, compared to increasingly decarbonised electricity generation, gas-fired heat will become comparatively more carbon intensive as the electricity grid is further decarbonised.

- **Policy SI4 Managing Heat Risk.** This policy sets states that development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.

- **Policy SI5 Water Infrastructure.** This states that major development proposals should achieve at least the BREEAM excellent standard for the 'WAT 01' water category or equivalent (commercial development).

- **Policy SI7 Reducing Waste and Supporting the Circular Economy.** This states that resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved, in part, through designing developments with adequate, flexible and easily accessible storage space and collection systems.

Energy Planning – GLA guidance on preparing energy assessments (June 2022)



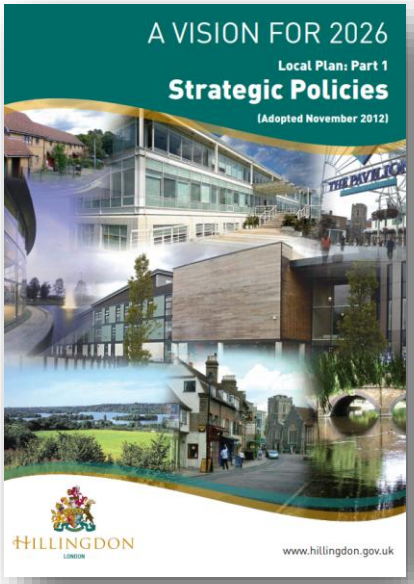
3.15 The guidance note provides further detail on addressing the London Plan's energy hierarchy through the provision of an energy assessment to accompany planning applications. The document sets out the expected carbon dioxide emissions targets for different building types.

3.16 The guidance outlines the requirement for all major application within London to achieve a minimum 35% carbon dioxide emissions savings over the Part L:2021 baseline through on-site means alone. The guidance also sets out the requirement to report the Energy Use Intensity (EUI) and the space heating demand of the development using the GLA's carbon emissions reporting spreadsheet.

Local

3.17 In determining the local context, London Borough of Hillingdon Local Plan Part 1: Strategic Policies (November 2012) sets out policy relevant to sustainable development.

London Borough of Hillingdon Local Plan Part 1: Strategic Policies (Novemer 2012)



3.18 The Local Plan demonstrates the importance the local authority places on maintaining and enhancing the natural environment, outlining a number of strategic objectives and policies to achieve this. The objectives and policies of relevance to the proposed development are outlined below.

3.19 **Strategic Objective 8:** Protect and enhance biodiversity to support the necessary changes to adapt to climate change. Where possible, encourage the development of wildlife corridors.

3.20 **Strategic Objective 10:** Improve and protect air and water quality, reduce adverse impacts from noise including the safeguarding of quiet areas and reduce the impacts of contaminated land.

3.21 **Strategic Objective 11:** Address the impacts of climate change, and minimise emissions of carbon and local air quality pollutants from new development and transport.

3.22 **Strategic Objective 13:** Support the objectives of sustainable waste management.

3.23 **Policy EM1: Climate Change Adaptation and Mitigation.** The Council will ensure that climate change mitigation is addressed at every stage of the development process by:

- Prioritising higher density development in urban and town centres that are well served by sustainable forms of transport.
- Promoting a modal shift away from private car use and requiring new development to include innovative initiatives to reduce car dependency.
- Ensuring development meets the highest possible design standards whilst still retaining competitiveness within the market.
- Working with developers of major schemes to identify the opportunities to help provide efficiency initiatives that can benefit the existing building stock.

- Promoting the use of decentralised energy within large scale development whilst improving local air quality levels.

- Targeting areas with high carbon emissions for additional reductions through low carbon strategies. These strategies will also have an objective to minimise other pollutants that impact on local air quality. Targeting areas of poor air quality for additional emissions reductions.

- Encouraging sustainable techniques to land remediation to reduce the need to transport waste to landfill. In particular developers should consider bioremediation as part of their proposals.

- Encouraging the installation of renewable energy for all new development in meeting the carbon reduction targets savings set out in the London Plan. Identify opportunities for new sources of electricity generation including anaerobic digestion, hydroelectricity and a greater use of waste as a resource.

The Borough will ensure that climate change adaptation is addressed at every stage of the development process by:

- Locating and designing development to minimise the probability and impacts of flooding.

- Requiring major development proposals to consider the whole water cycle impact which includes flood risk management, foul and surface water drainage and water consumption.

- Giving preference to development of previously developed land to avoid the loss of further green areas.

- Promoting the use of living walls and roofs, alongside sustainable forms of drainage to manage surface water run-off and increase the amount of carbon sinks.

- Promoting the inclusion of passive design measures to reduce the impacts of urban heat effects.

Other Considerations

Declaration of a Climate Emergency (January 2020)

3.24 On the 16th January 2020, the London Borough of Hillingdon Council declared a climate change emergency, agreeing to extend the Council's climate change targets beyond those set at the time to become carbon neutral across the Council's services by 2030, and to achieve 100% clean energy across the Council's services by 2030. The Council resolved that, to meet these targets practically and to be accountable to residents for them:

- Recognise that, initially, they will span the Council's direct services and, subject to future review by the Cabinet, may grow to encompass the Council's wider commercial supply chain;

- The Cabinet Member for Housing and the Environment, in consultation with the Leader of the Council assumes a new Executive responsibility within the Council's Constitution for climate change strategy;

- Responsibility for oversight and scrutiny of the Council's efforts in relation to climate change be given to the Corporate Services, Commerce and Communities Policy Overview Committee to review as they see fit and engage the community;

- The Chief Executive designate a lead officer to act corporately on climate change an in pursuit of the above targets;

- An annual action plan be submitted to Cabinet, aligned with the budget, to monitor achievement. Furthermore, a review of environmental performance reporting be undertaken to actively engage staff in ways to tackle climate change in their service areas and communicate progress more widely to residents.

4. SUSTAINABILITY STATEMENT

4.1 The Sustainability & Energy Statement for the proposed development is divided into two main parts.

4.2 The sustainability strategy for the proposed development has been assessed in line with the guidance set out within relevant policies of the London Borough of Hillingdon Local Plan Part 1: Strategic Policies. This enables a holistic sustainability approach to be set out for the proposed development. The London Borough of Hillingdon Local Plan requires that all new development provides sustainable, high quality and inclusive design, and this therefore represents best practice guidance to meet high standards of sustainable design and construction.

4.3 In addition, a BREEAM Pre-Assessment has been carried out by SCS Partnership to accompany this application. The Pre-Assessment shows that the proposed development has the potential to achieve a BREEAM rating of 'Excellent', based on the 2018 New Construction methodology, with an anticipated BREEAM score of 72.6%.

4.4 The carbon dioxide (CO_2) emissions reduction strategy for the proposed building to be delivered as part the development is based on the energy hierarchy to provide a rigorous methodology, which maximises cost-effective opportunities for emissions reduction, as detailed in Section 5.

Sustainable Design and Construction

4.5 In line with the guidance provided in the London Borough of Hillingdon Local Plan, the sustainability features of the proposed development are outlined below.

4.6 Issues related to energy conservation, renewables and reducing greenhouse gases follow in a dedicated section.

Making Effective Use of Land

4.7 As shown below in Figure 4.1, the site currently comprises an under-utilised grade level car park, which was last used by NCP for this use in August 2021.

Figure 4.1 Current site

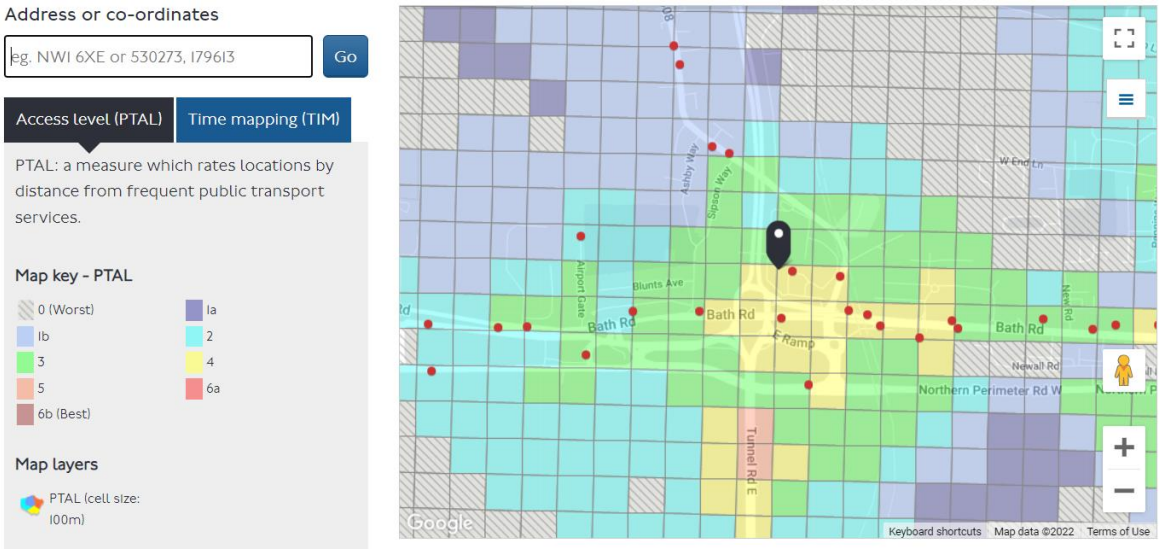
Approximate site boundary

4.8 The site is therefore considered to have been previously developed, and the proposed scheme will provide industrial and logistics floorspace in a sustainable location within the London Borough of Hillingdon.

Location and Transport

4.9 According to the Transport Assessment, produced by Mayer Brown in July 2022, the site has public transport connections for the London bus network, with the site scoring a PTAL rating of 3 to 4. The site is served by a number of regular bus stops, including one located to the east of the site on Bath Road, which is served by the 81, 105, 111, 278, 285, and 423 bus services.

Figure 4.2 Extract from TfL PTAL map



4.10 Access to the site will be via the southern boundary from Bath Road, and a pedestrian footway will be provided either side of the access. An access road will be provided to serve the industrial units, and will run along the eastern boundary of the site to provide access to each of the units.

4.11 A total of 91 car parking spaces will be provided, located alongside each unit and within the southwestern corner of the site. This provision will include for nine disabled persons spaces, and 10 spaces for electric vehicle (EV) charging. This is in compliance with the London Borough of Hillingdon maximum car parking standards. An additional five spaces will be provided in the southwestern corner of the site for motorcycle parking.

4.12 A cycle parking area will be provided in the southeast corner of the site, which will allow for ease of access to the existing cycle network on Bath Road. A total of 40 long stay cycle parking spaces will be provided by way of 20 Sheffield stands for staff. These stands will be located within a secure compound. An additional 10 short stay cycle parking spaces will be provided by way of five Sheffield stands for visitors. This is in line with the minimum requirements set out within the London Plan.

4.13 The Vehicle Trip Assessment, undertaken as part of the Transport Assessment, indicates that there will be a net increase of 34 vehicles per hour during the mornings, and 31 vehicles per hour during the evenings, as a result of the proposed development. This is not considered to present a material impact on the operation of the local highways network, and the net change is considered to fall within daily fluctuations of traffic during weekday peak hours on the A4 Bath Road.

4.14 A Workplace Travel Plan has also been prepared by Mayer Brown in July 2022. This document has been developed as a long-term strategy with the aim of promoting sustainable modes of transport to reduce reliance on single occupancy private car travel. It is proposed that a number of measures be implemented in order to work towards the objectives and targets of the Travel Plan. These include the provision of a Staff Travel Pack for all new employees and a Travel Information Noticeboard that will detail local travel options and infrastructure with the aim of encouraging the use of sustainable travel modes.

Reducing Water Consumption

4.15 The majority of England is under water stress, with more water often being consumed than is available during dry weather. As the population continues to grow, and with changes to the frequency of rainfall events projected as a result of climate change, this situation will be further exacerbated, with even greater pressure exerted on the supply of potable water.

4.16 In order to reduce internal water consumption within the proposed scheme, it is intended that water-efficient fittings, such as low volume dual flush toilets and taps with restricted flow rates, will be provided within the building. An adjustable water leak detection system will also be provided based on differential meter flow rates, and solenoid shut-off valves controlled with PIR sensors will be

employed within each toilet area. The BREEAM Pre-Assessment which accompanies this Statement demonstrates that through the employment of the proposed measures the scheme will achieve 7 out of 9 credits (78%) in the Water category.

Materials and Waste

4.17 Materials should be responsibly sourced by the main contractor, and be specified to have a low embodied impact. Materials with a low embodied impact, as defined within the BRE Green Guide to Specification, should be selected for use in the building design and construction.

4.18 The selection of materials is determined by a variety of factors, such as the architectural context, design rationale, embodied carbon and maintenance requirements. For the proposed development, consideration will be given to the lifecycle environmental performance with materials selected in consideration of the BRE's Green Guide to Specification, aiming for A or B rated materials wherever possible.

4.19 Circular economy principles will be applied during the procurement of materials. The use of locally sourced materials will be prioritised wherever possible to reduce the impacts associated with the transportation of materials, and therefore aiding in minimising the associated embodied carbon emissions. Using materials produced in the local area will also aid in developing the identity of the development, by ensuring it is in line with the local character and context. For the proposed development, there will be a focus on sustainable design, with materials selected that are in keeping with the local vernacular and landscape character, aiming for locally sourced materials where possible. Further to this, the use of repurposed and recycled materials will be prioritised where feasible and appropriate, minimising the need for new and virgin materials, and aiding to minimise waste. Materials will also be selected in consideration of the potential for their reuse, repurposing and recycling at the end of their life, which will aid in minimising the materials wasted during later works to the buildings, or following their demolition at the end of their life. In addition, it is intended that any materials arising during the demolition and construction phases will be reused on-site or within the surrounding area where possible, maximising the potential to maintain materials at their highest value where feasible. Through the implementation of circular economy principles, the waste arising from the proposed development will be minimised, and the use of recycled and reused materials will be maximised.

4.20 During detailed design of the building fabric, consideration will be given to minimising the environmental impact of materials, by selecting non-toxic and robust materials to ensure longevity and a minimal impact on the health of occupants.

4.21 Timber will be selected and purchased in consideration of sustainability certification. It is intended that all structural timber elements along with any timber used for temporary uses, such as scaffolding, will be sustainably sourced, e.g. from FSC and/or PEFC sources.

4.22 Consideration has been given to the reduction and recycling of waste during both the construction and operation phases.

4.23 During the construction phase, principal contractor will be required to implement a Site Waste Management Plan (SWMP), which will detail who will be responsible for resource management, which types of waste will be generated, how the waste will be managed (e.g. reduced, reused or recycled), which contractors will be used, and how the quantity of waste generated by the project will be measured. It is anticipated that, during the construction phase, a target to divert at least 95% of non-hazardous materials from landfill will be targeted.

4.24 As demonstrated within the BREEAM Pre-Assessment, the proposed development is demonstrated to achieve 9 out of 14 credits (64%) in the Materials category, and 7 out of 10 credits (70%) for the Waste category.

Nature Conservation and Ecology

4.25 The Preliminary Ecological Appraisal, prepared by Middlemarch in June 2022, confirms that the site currently comprises a disused car park with a parcel of woodland along the southern border. It is noted that a disused site is situated to the north, and a residential neighbourhood to the west. tees line the eastern boundary of the site, with a large steep road verge descending to the M4 located behind this.

4.26 It is there are no statutory or non-statutory nature conservation designations present within the site. One European statutory site, the South West London Waterbodies Ramsar and Special Protection Area (SPA) is located within 5m of the site, and one non-statutory site, the Field Close Open Space Roughs Site of Importance for Nature Conservation (SINC) is located within 1km. Given the distance separating the proposed development site from the identified nature conservation sites and the built-up nature of the intervening habitats, no adverse impacts are anticipated as a result of the proposed scheme.

4.27 The habitats identified within the proposed site boundaries include a disused car park security office, large areas of hard-standing associated with the existing car park use, ephemeral and short perennial vegetation, semi-natural Broadleaved Woodland and a brick wall. The woodland on-site is of intrinsic ecological value due to its maturity and potential to support a range of protected/notable species. It is noted that this habitat type cannot be easily replicated if lost and therefore should be retained where possible. The development proposals should be designed, where possible, to allow for the retention of existing notable habitats including the ephemeral and short-perennial vegetation and woodland. It is recommended that any trees on or overhanging the site, which are retained as a part of any proposed works should be protected in accordance with British Standard 5837: 2012 "Trees in relation to design, demolition and construction - recommendations". In addition, protection should be installed on site prior to the commencement of any works on site. If retention is not possible,

appropriate replacement planting should be incorporated into the soft landscape scheme in accordance with the ecological mitigation hierarchy. Only native and/or wildlife attracting species should be planted. An Arboricultural Impact Assessment & Method Statement has been prepared by Tamala Trees in July 2022, which confirms that the new buildings will be located completely outside all the Root Protection Areas (RPA) of surveyed trees, and that the required protection measures will be installed prior to any site activity and retained for the duration of works. All site welfare and storage facilites will be located in areas outside of the designated tree protection and within the existing hard standing areas.

4.28 Whilst it is considered unlikely that bats would roost within the site, the woodland and, to a smaller extent, the ephemeral and short perennial vegetation offer suitable foraging habitat for bats with connectivity to the wider landscape. Any new lighting, either temporary or permanent, has the potential to indirectly impact any foraging or commuting bats. It is therefore recommended that external lighting be designed in consideration of good practice guidance to minimise disturbance to bats.

4.29 The majority of the site is considered to be sub-optimal for badger as it is dominated by the built environment; however, the woodland to the south may offer some potential foraging habitat with links to the wider landscape. No evidence of badger, such as setts or latrines, was observed on site during the survey. Nevertheless, badgers are mobile animals and there is a possibility they may pass through the site. Further to this, it is noted that the woodland and ephemeral and short perennial vegetation on site offer some potential refuge and foraging opportunities for hedgehog, with connectivity to the wider landscape. Therefore, there is a possibility that hedgehog utilise the site in some capacity. To ensure no harm occurs to mammals that may use the site, it is recommended that any excavations that need to be left overnight should be covered or fitted with mammal ramps to ensure that any animals that enter can safely escape. Any open pipework with an outside diameter of greater than 120 mm must be covered at the end of each workday to prevent animals entering or becoming trapped.

4.30 The majority of the site is considered to be sub-optimal for amphibians and reptiles as it is dominated by the built environment and no suitable breeding habitat is present on site. The ephemeral and short perennial vegetation does not offer sufficient shelter from predation. The woodland to the south may offer some terrestrial opportunities; however, these are limited in extent and isolated from suitable habitat within the wider landscape by busy roads and brick walls.

4.31 The woodland along the southern boundary offers suitable nesting habitat for a range of more common bird species. The development of the site has the potential to cause direct harm or injury to breeding birds if timed to occur within the nesting bird season. Vegetation clearance should therefore be undertaken outside the nesting bird season. The nesting bird season is weather dependent but generally extends between March and September inclusive (peak period March-August). If this is not

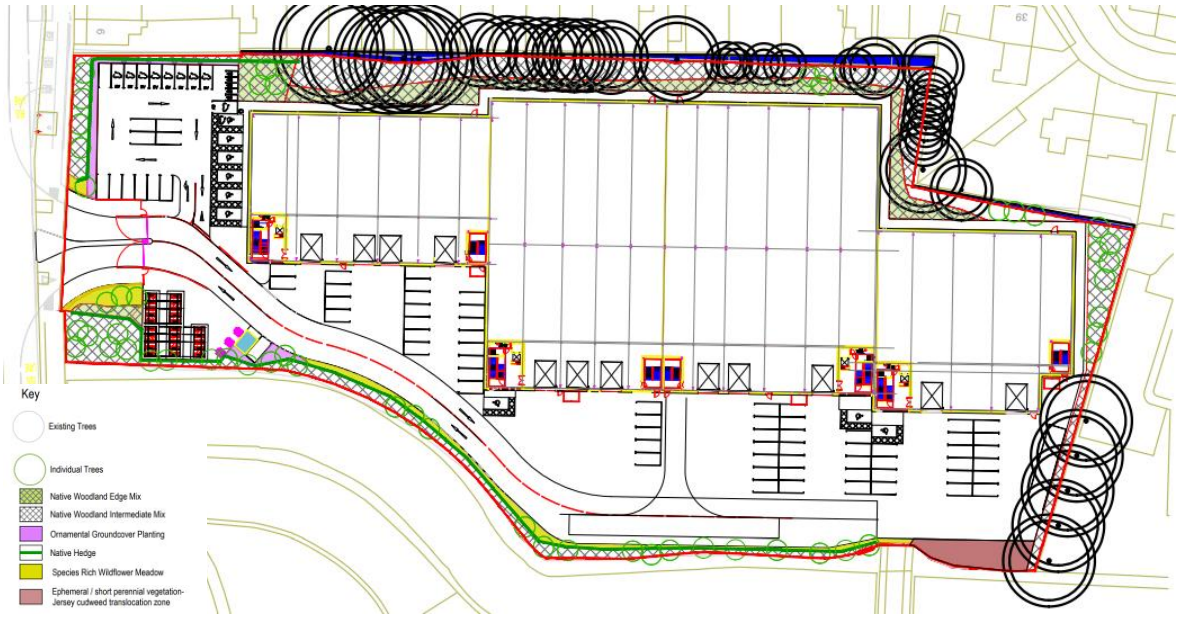
possible then any vegetation to be removed or disturbed should be checked by an experienced ecologist for nesting birds immediately prior to works commencing. If birds are found to be nesting any works which may affect them should be delayed until the young have fledged and the nest has been abandoned naturally, for example via the implementation of an appropriate buffer zone (species dependent) around the nest in which no disturbance is permitted until the nest is no longer in use.

4.32 The following enhancement measures are also recommended for incorporation within the Landscaping Strategy of the proposed development to aid the delivery of net gains for biodiversity:

- Planting of habitats which will be of value to wildlife, such as ephemeral and short perennial vegetation, and nectar-rich native plants to attract pollinators.
- Inclusion of hedgehog passes under any fence lines to allow connectivity between the site and the wider area.
- Provision of nesting/roosting habitat, such as installation of nest boxes for species such as house sparrow, and bat boxes.
- Creation of deadwood habitat of benefit to species such as stag beetle. Felled timber arising from woodland clearance should be positioned in partial shade and partially buried.

4.33 The proposed Soft Landscaping Strategy, prepared by EPD Landscape in July 2022, is shown in Figure 4.3 below.

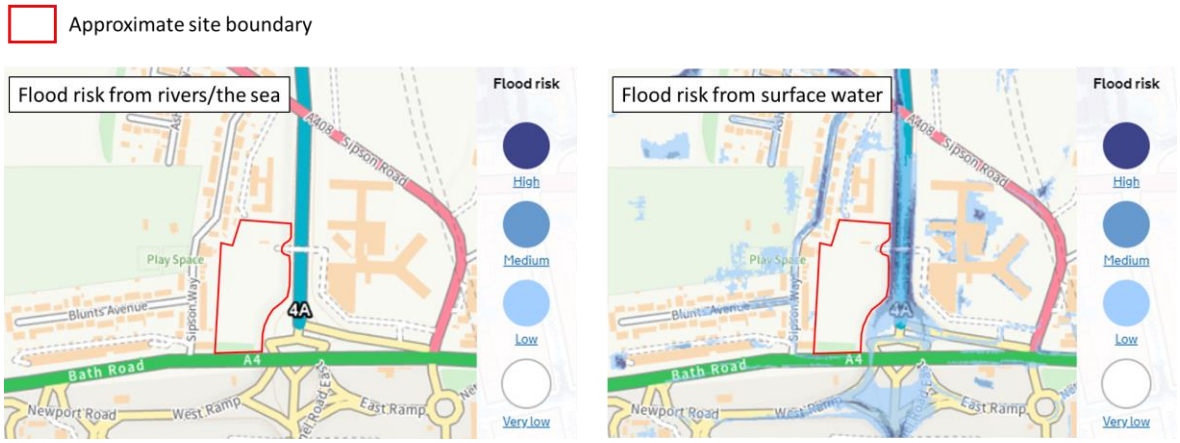
Figure 4.3 Proposed soft landscaping strategy



Reducing Flood Risk and Surface Water Run-off

4.34 As detailed within the Flood Risk Assessment prepared by Hydrock Consultants Limited in July 2022, and confirmed in Figure 4.4 below, the site is located wholly within Flood Zone 1, indicating a very low risk of flooding from tidal and fluvial sources. The entirety of the site is also shown to be at very low risk of flooding from pluvial (surface water) sources. There are some areas at low-to-high risk of surface water flooding within the surrounding road network. Whilst this risk is anticipated to be contained within the road network, the use of landscaping and the integration of an effective drainage strategy is proposed to ensure surface water is managed on the site to reduce burden on the surrounding drainage infrastructure.

Figure 4.4 Extract from the Environment Agency's online flood map



4.35 As detailed in the proposed Drainage Layouts, also prepared by Hydrock Consultants Limited in July 2022, a sustainable drainage system (SuDS) will be employed to manage surface water runoff on the site. This system will utilise a below-ground attenuation tank, located in the south-western corner of the site beneath the proposed car park, to attenuate water generated on the site prior to discharge to the existing Thames Water drainage network. It is intended that the surface water attenuated within the proposed tank will be discharged via a Hydrobrake flow control at a rate of no more than 8.1 l/s to the existing Thames Water public storm sewer located on Bath Road (A4) to the south of the site. The incorporation of the proposed drainage system will ensure the risk of flooding on-site it mitigated up to and including a 1 in 100-year + 40% climate change allowance rainfall event.

Land Contamination

4.36 As detailed within the Contaminated Land Assessment, undertaken by Hydrock in July 2022, the ground conditions at the site comprise areas of Made Ground, associated with historical uses of the site, overlying the Langley Silt Member, underlain by the Taplow Gravel Member and London Clay Formation. It is noted that both the Langley Silt Member and London Clay Formation are Unproductive Strata, but that the Taplow Gravel Member is designated as a Principal Aquifer. The site is not located within a Source Protection Zone (SPZ).

4.37 Based on the historical and current land use at the site, the Contaminated Land Assessment concludes that the site is unlikely to be classified as Contaminated Land. The overall risk from land contamination at the site is considered to be low for the current development, as it is covered by hard standing or buildings limiting the possibility of contact with the soils, as well as the risk of significant rainwater infiltration leading to leaching. The overall risk for a redeveloped site is assessed to be moderate, with some specific potentially high risks, but this would need to be confirmed by appropriate intrusive investigation, testing and assessment of the results of the investigation. It is recommended that an appropriate supplementary intrusive investigation be undertaken to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risk. Details of the scope of the proposed supplementary investigation are provided within the Contaminated Land Assessment, undertaken by Hydrock in July 2022, which has been submitted alongside this application.

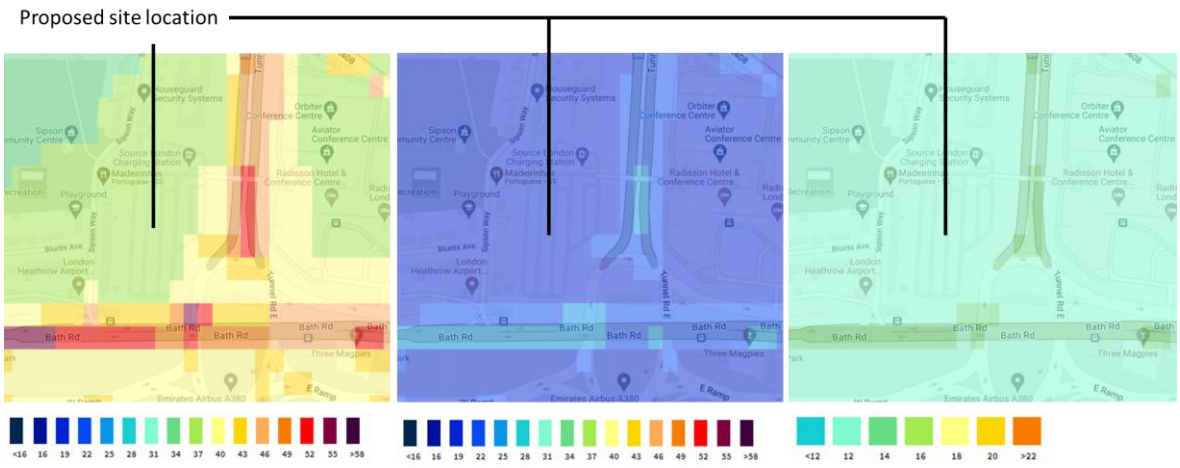
Air Pollution

4.38 The Environment Act 1995 requires all Local Authorities to review air quality within their districts. If it appears that any air quality 'Objective; prescribed in the regulations and in the National Air Quality Strategy is not likely to be achieved, then the local authority must designate the affected area as an Air Quality Management Area (AQMA).

4.39 The site location, and the area from the southern boundary of the London Borough of Hillingdon to the border defined by the A40 corridor, is specified as an AQMA due to excessive levels of nitrogen dioxide (NO_2) resulting from road transport.

4.40 Figure 4.5 below, taken from the London Air Annual Pollution Maps, shows the levels of NO_2, PM_{10} and $PM_{2.5}$ measured at the site in 2016. The images below indicate that the levels of NO_2, PM_{10} and $PM_{2.5}$ present at the site in 2016 would have been below both the National Air Quality Objective (NAQO) and World Health Organisation (WHO) guidelines.

Figure 4.5 Maps indicating annual levels of NO_2 (left), PM_{10} (middle) and $PM_{2.5}$ (right) exposure



4.41 An Air Quality Assessment of the proposed development has been carried out by Mayer Brown in July 2022, which confirms that the site is located within the London Borough of Hillingdon declared AQMA, and the Heathrow Air Quality Focus Area. As part of this assessment, a construction dust assessment has been undertaken for the four stages of construction activities associated with the proposed development in accordance with Greater London Authority (GLA) and Institute of Air Quality Management (IAQM) guidance on the assessment of dust from demolition and construction. Mitigation measures have been proposed for construction traffic and stationary plant associated with the proposed development, including the undertaking of dust monitoring, the switching off of vehicle engines when stationary, the compliance of vehicles with the Low Emission Zone and the London Non-Road Mobile Machinery (NRMM) standards, where applicable, and the location of plant away from boundaries close to residential areas. The mitigation measures outlined in the Air Quality Assessment make up part of a Construction Environmental Management Plan (CEMP) that should be implemented to minimise the potential adverse construction dust impacts throughout all the relevant construction stages. Following the successful implementation of the specific mitigation measures for construction dust, the residual effects of construction dust and emissions from construction plant/vehicles upon the local area and sensitive receptors although adverse, will be temporary and considered to be 'not significant'.

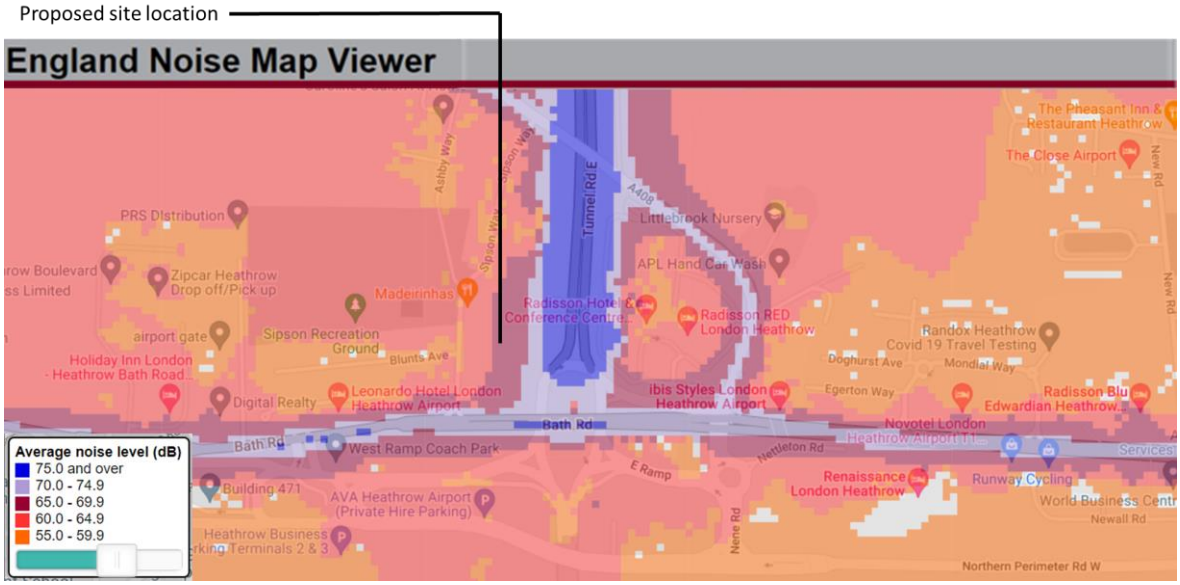
4.42 The Air Quality Assessment concludes that predicted development traffic associated with the worst-case proposed development/use (B8) is unlikely to result in a detrimental pollution impact upon the local road network and the current pollution levels. In addition, the Air Quality Neutral Assessment undertaken predicts that the total transport emissions associated with the proposed redevelopment are expected to result in a reduction when compared to the transport emissions benchmarks. Therefore, the proposals have been considered to be air quality neutral in relation to Transport Emissions.

4.43 Based on the conclusions of the Air Quality Assessment, the proposed development is unlikely to raise any significant adverse impacts upon the health and/or quality of life of any existing neighbours, as a result of any anticipated changes to air quality. It is therefore concluded that, should the recommended mitigation measures be implemented, the proposed development is likely to comply fully with air quality related national, regional and local planning policy.

Noise and Vibration

4.44 The development is located within proximity to transport noise sources. Tunnel Road E (M4) forms the eastern boundary of the site, whilst Bath Road (A4) forms the southern boundary. The map below indicates that there may be impact in terms of noise on future site users arising from traffic present on these roads.

Figure 4.6 Road traffic noise map



4.45 The Noise Assessment prepared by Mayer Brown in July 2022 concludes that the proposed development will not have a significant adverse impact on the residential properties located within the immediate surroundings of the site. This is due to the proposed arrangement of the site, which places the units along the western boundary and therefore enables activities on the eastern side of the units to be spatially distanced from the properties, with the mass of the buildings providing acoustic screening.

4.46 The Noise Assessment also considers the potential impact of the proposals on the consented hotel development that is to be located to the north of the site. Based on the technical documents submitted in support of the consented application, the eternal fabric of the consented hotel will provide a high level of sound insulation, which will ensure future hotel guests are protected from the high environmental noise levels arising from the M4 spur road to the east, and Heathrow Airport to the south. It is considered that this control, which was required as a condition of the planning permission, will also provide sufficient acoustic protection against operational noise that may be generated by the proposed development.

4.47 Further to this, the potential change in traffic noise levels has been considered. It is concluded that, with respect to traffic noise, the proposed development will result in a ‘negligible’ impact, during both the construction and operational phases.

4.48 Based on the conclusions of the Noise Assessment, it is considered that the proposed development fully complies with national and local planning policy with respect to noise.

Light Pollution

4.49 It is recommended within the Preliminary Ecological Appraisal, prepared by Middlemarch in June 2022, that sensitive lighting should be integrated into the design to minimise potential impacts on sensitive receptors, such as bat species. Where possible, new lighting on the development site should be provided in line with best practice guidance relating to lighting and biodiversity, examples of which include:

- Avoiding the installation of new lighting in proximity to key ecological features, such as site boundaries.
- Using modern LED fittings rather than metal halide or sodium fittings, as modern LEDs emit negligible UV radiation.
- The use of directional lighting to reduce light spill, e.g. by installing bespoke fittings or using hoods or shields. For example, downlighting can be used to illuminate features such as footpaths whilst reducing the horizontal and vertical spill of light.
- Where the use of bollard lighting is proposed, columns should be designed to reduce horizontal light spill.
- Implementing controls to ensure lighting is only active when needed, e.g. the use of timers or motion sensors.

4.50 An External Lighting Strategy has been prepared by MBA Consulting Engineers in July 2022, and accompanies this submission.

- Use of floor surface materials with low reflective quality. This will ensure that bats using the site and surrounding area are not affected by reflected illumination.
- For internal lights, recessed light fittings cause significantly less glare than pendant type fittings. The use of low-glare glass may also be appropriate where internal lighting has the potential to influence sensitive ecological receptors.

Water Pollution

4.51 The implementation of the proposed sustainable drainage system (SuDS), prepared by XX in XX 2022, will include appropriate pollution control measures to minimise the risk of pollution entering the ground from surface water runoff from the development. An appropriate SuDS treatment train, consisting of permeable paving and raingarden elements, has been incorporated within the design to treat surface water before it is discharged to the public sewer network.

4.52 Additional measures will also be adopted during construction to minimise the risk of ground and surface water pollution, including:

- Oil separators;
- Clear marking and signage of drainage stems;
- Any on-site fuel or oil delivery areas will be fully bunded;
- Areas for cleaning activities will also be bunded; and
- Appropriate best practice measures shall be implemented in line with the GLA's SPG 'The Control of Dust and Emissions from Construction and Demolition' (July 2014).

5. ENERGY STRATEGY

5.1 With reference to the policy requirements, guidance and industry best practice detailed in Section 3, an energy and carbon dioxide (CO_2) emissions strategy has been defined for the proposed development. The proposed energy performance of the scheme has been analysed and evaluated to target a high level of CO_2 emissions performance when assessed against Part L:2013 of the Building Regulations and associated policies, accounting for economic, technical and functional feasibility.

5.2 The following section includes a breakdown of potential measures proposed at each level of the Energy Hierarchy (below), including a renewable energy generation options study.

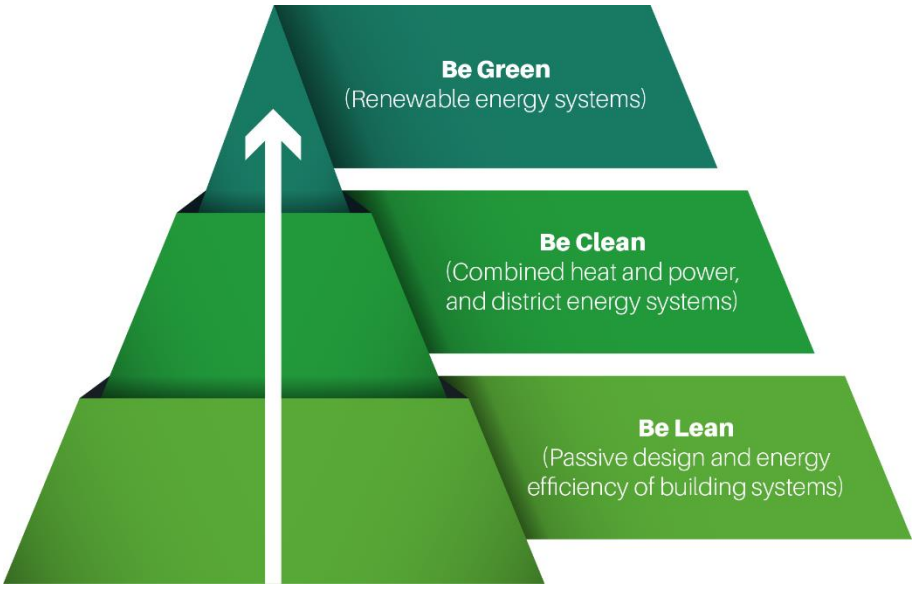
The Energy Hierarchy

5.3 The proposed energy strategy is based upon the principles of the Energy Hierarchy on the basis that it is preferable to reduce carbon dioxide emissions through reduced energy consumption above decarbonisation through alternative energy sources.

5.4 The tiers of the Energy Hierarchy are:

- Be Lean Use less energy
- Be Clean Supply energy efficiently
- Be Green Use renewable energy

Figure 5.1 The Energy Hierarchy



‘Be Lean’ (Use Less Energy)

5.5 The proposed spaces consist of general industrial and associated office uses. The building fabric specification has therefore been driven by the energy demand profile associated with such uses. Industrial areas do not require space conditioning to the same extent as fully occupied offices and as such will have a lower level of heat loss through the building fabric. The implication of this is that extensive levels of insulation will not be required to ensure the development’s operational energy demand for space heating and cooling is minimised.

5.6 Passive design utilises daylight, solar energy, shading and stack or wind driven ventilation to illuminate, heat, shade and, where necessary, ventilate/cool the building, thus requiring less (mechanical) energy to achieve the performance standards for health and wellbeing of the occupants.

5.7 Site characteristics relating to local climate, surroundings, scale and size of the development therefore influence the potential energy requirements and savings that can be achieved through the consideration of this. The parameters that most influence the potential to utilise sunlight and solar gains are the orientation and layout of buildings, however these are typically driven by factors other than energy efficiency or bioclimatic design considerations, with the form of industrial buildings driven principally by function. The deep plan nature of functional industrial buildings mean that passive design has a limited impact on overall energy use. Nevertheless, this will be prioritised where possible, and it is intended that windows will be provided on the southern and eastern facades to provide natural daylight and solar gains to the spaces (predominantly circulation spaces, offices and mezzanines) that they serve. This will reduce the mechanical energy required for lighting and heating in these spaces. Furthermore, the conjoined nature of the units will minimise heat loss through the external building envelope and the low surface area to mass ratio will also aid in minimising heat loss.

5.8 U-values are a measure of the rate of heat transfer through a building element over a given area, under standardised conditions. They measure the rate at which heat is lost or gained through a fabric.

5.9 The following U-values are proposed as a means of limiting heat loss through the proposed building fabric.

Table 5.1 Proposed building fabric U-values

Building Fabric Element	Part L:2021 backstop U-values (W/m²K)	Proposed U-values (W/m²K)
Ground floor	0.18	0.18
External wall	0.26	0.26
Roof	0.18	0.18
Windows	1.60 (including frame)	1.60 (including frame)

5.10 It is proposed that the glazing will be double glazed with a low emissivity coating. Although this has yet to be formally specified, it is expected that window U-values will be 1.60 W/m²K or better (including frame).

5.11 A high level of air tightness is proposed, where a level equal to or below 3 m³/h/m² @ 50Pa shall be targeted, meaning that air infiltration between the internal and the external environment will be largely controlled, and space heating/cooling demand further reduced.

5.12 High efficiency plant, equipment and controls are proposed to limit the energy consumed in order to provide the required level of indoor environmental performance and control. Performance efficiency values have been specified in line with the requirements of the Building Regulations in order to minimise carbon dioxide emissions as far as possible through the 'Be Lean' stage.

- Low energy LED lighting will be installed throughout the scheme, including daylight dimming and presence detection controls where appropriate.
- In order to meet the requirements of the GLA's Energy Planning Guidance document under the 'Be Lean' scenario, space and wate heating has been specified as gas-fired boilers with an efficiency of 93%.
- It is proposed that the warehouse spaces will be naturally ventilated. It is intended that the office spaces be naturally ventilated during the summer months, whilst outside air will be provided via mechanical ventilation with heat recovery, with an intended specific fan power (SFP) of 1.1 W/l/s and heat exchanger efficiency of 70%, during the winter. Toilets will be provided with extract ventilation only, using fans with a specific fan power not greater than 0.3 W/l/s.

- Cooling will be provided to the proposed office spaces using a variable refrigerant flow (VRF) system with a seasonal energy efficiency ratio of at least 5.0.
- Energy usage will be separately sub-metered to ensure that energy usage van be appropriately measured and managed, based on the end use category.
- Variable speed pumps will be employed to modulate flow rates as required by demand.
- It is intended that the electricity power factor will be greater than 0.95 and light metering with warnings about out of range values will be utilised as part of the building management system.

5.13 Energy modelling of the proposed scheme has been undertaken using the iSBEM accredited software. The site location and weather have been modelled as London (Heathrow), with the surroundings modelled as a town/city to account for the microclimate likely to be present at the site. The building occupancy has been modelled as 24-hour warehouse and office uses.

5.14 Based on the energy analysis of the proposed spaces, the total energy demand for the development is shown below.

Table 5.2 Energy demand

Building Use	Energy demand following energy efficiency measures (MWh per year)					
	Space Heating	Hot Water	Lighting	Auxiliary	Cooling	Unregulated
Development Total	32.3	38.0	163.1	5.4	8.6	330.7

5.15 The carbon dioxide emissions for the non-domestic spaces under the ‘Be Lean’ tier of the Energy Hierarchy are shown below. A Building Regulation England Part L (BREL) worksheet showing the ‘Be Lean’ performance of the modelled spaces is provided in Appendix A2.

Figure 5.3 Non-domestic carbon dioxide emissions (Be Lean)

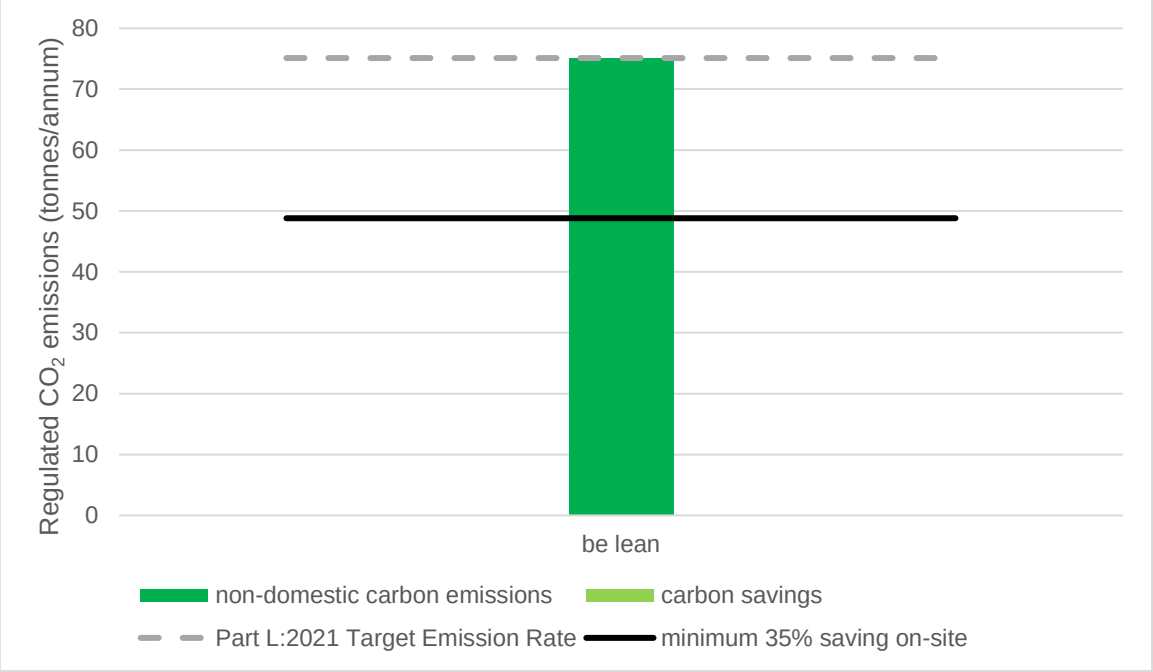


Table 5.3 Non-domestic carbon dioxide emissions (Be Lean)

TER: Baseline: Part L:2021 Emissions (tonnes CO_2 per annum)	BER: Proposed 'Be Lean' Emissions (tonnes CO_2 per annum)	Emissions Savings (tonnes CO_2 per annum)	Emissions Savings (%)
75.1	75.1	0	0%

5.16 The above analysis shows that the non-domestic spaces achieve a carbon dioxide emissions saving of 0% through energy efficiency measures alone, under the 'Be Lean' scenario. This is in compliance with Part L:2021 of the Building Regulations. It is noted that, whilst the London Plan requires a minimum 15% reduction in carbon dioxide emissions through energy efficiency measures, due to the nature of the proposals, the vast majority of energy demand is related to lighting. However, as the end users of the proposed development are currently unknown, the employment of a Part L:2021-compliant lighting strategy has been employed for the purposes of this Energy Strategy. It is considered that the results presented here demonstrate a worst-case scenario, as there is potential that the proposals will be fitted out with more efficient systems by the end users.

'Be Clean' (Supply Energy Efficiently)

5.17 The potential for the proposed development to incorporate a low carbon heating/cooling system has been reviewed for the scheme, in line with the hierarchy presented in the London Plan policy SI2, copied below:

1. Connection to existing heating or cooling networks;

2. Site wide CHP network; and

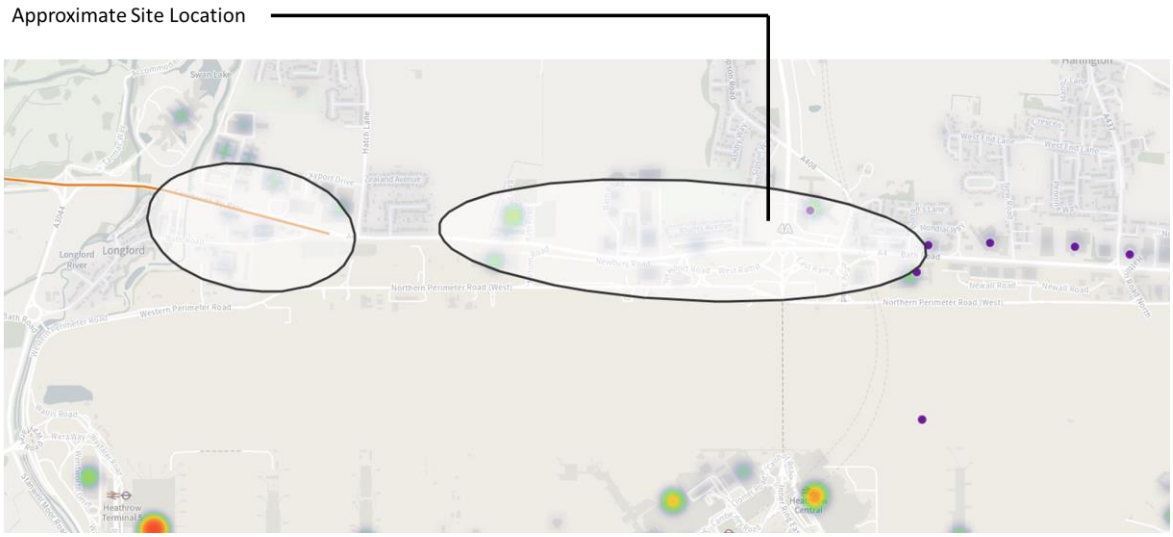
3. Communal heating and cooling.

5.18 The London Heat Map is a tool provided by the Mayor of London to identify opportunities for decentralised energy projects in London. It builds on the 2005 London Community Heating Development Study.

5.19 The image below is an extract from the London Heat Map, showing the area in the vicinity of the site. It illustrates;

- Heat demand (areas of heat demand are shown in red, with areas with a high density of heat demand appearing more opaque, and areas of zero heat demand appearing transparent);
- Existing heat networks (shown as red lines);
- Proposed heat networks (shown as orange lines);
- Heatmap study areas (shown as transparent white circles); and
- Potential heat supply sites (shown as purple dots).

Figure 5.4 Extract from the London Heat Map



5.20 The extract above indicates that the proposed development site is located within an area of low heat density. There are no existing district heat networks located within the surrounding area, however there is proposed district heat network to the west of the site at Hillingdon Bath Road. It is also indicated that the proposed development site is located opposite a potential heat supply at the

Excelsior Hotel site. Heat will be supplied to this site via a Combined Heat and Powe (CHP) system, likely including gas-fired boilers. It is unlikely to be suitable for a connection to the proposed development site due to the infrastructure costs associated with establishing a connection and the separation of the two sites by the M4 spur – Tunnel Road West. in addition, the proposed development site is shown to fall within a Heatmap Study Area, for which a study was undertaken by the London Borough of Hillingdon in January 2011. This study concluded that the properties located along Bath Road were a low priority with respect to the provision of district heating, in particular due to the fact that all the identified properties are within the private sectors, the difficulty of crossing the M25 and Bath Road, and the high capital costs associated with delivering a district heat network in this location.

5.21 The use of CHP is considered to be unviable for the proposed development site. CHP technology is appropriate for building uses with large hot water demands due to the requirements for CHP to be kept running to meet a base load. As heating is not required during summer months, base loads are driven by hot water demand. Due to the planned use of the proposed development for flexible industrial and office uses, hot water demand for the development is low and as such CHP does not represent a feasible technology for the proposed development.

5.22 It is instead proposed that space heating demand be served air source heat pump (ASHP) systems, and water heating demand served by instantaneous, point-of-use water heaters, to be provided within each of the proposed units. It is noted that, through the use of all-electric systems, the carbon emissions associated with the development will decrease in line with the decarbonisation of the electricity grid. The use of the proposed all-electric systems has been included for within the “Be Green” modelling of the proposed development, the results for which are presented in the next section.

‘Be Green’ (Utilise Renewable Technologies)

5.23 The proposed development has given consideration to renewable energy technologies that may be applicable to deliver the required level of carbon dioxide savings over the Part L:2021 baseline, and the likely local effects on the environment.

5.24 A full review of potentially applicable renewable technologies has been carried out, considering both the effectiveness and viability of the different technologies. Full details of the assessment and outcomes are provided in Appendix A3.

5.25 Given the site location, lack of local existing or proposed heat networks, it is proposed that air source heat pump (ASHP) technology is employed to serve the heating and cooling demands of the development.

5.26 It is intended that separate systems will be employed for the individual buildings to allow for tenancy flexibility and differing fit-out schedules. It is proposed that the ASHP systems will deliver a heating seasonal coefficient of performance of 4.0 and a cooling seasonal energy efficiency ratio of 5.0. As the design progresses, acoustic measures to limit the noise generated by the outside unit of the systems during operation will be considered. It is intended that water heating demand will be served by direct electric point of use water heaters, with a heating efficiency of 100%.

5.27 The heat pumps will provide 100% of the annual heat and cooling load for the site and it is currently estimated that 15.7 MWh/annum of heat/cooling energy will be provided by the units for space heating and cooling.

5.28 It is expected that the ASHP system employed will be an approved product on the Microgeneration Certification Scheme and will qualify for the enhanced capital allowances Energy Technology List, should this be applicable. It is not anticipated that any additional equipment will be required for top up or during peak loads, although this will be further confirmed during detailed design.

5.29 Detailed pipework design is currently being developed and as such it has not yet been possible to calculate precise details of heat losses from pipework. As a worst-case scenario, a 25% loss factor has been applied when undertaking the carbon dioxide emissions calculations for the ‘Be Green’ stage.

5.30 The projected life cycle costs associated with the proposed building services are detailed within the Life Cycle Assessment (LCA) Report, prepared by Sustainable Construction Services in June 2022, and submitted as part of the BREEAM Pre-Assessment submission documentation.

5.31 It is noted that, whilst the employment of photovoltaic (PV) technology is feasible for the proposed development, this has not been included for at this stage, as it is understood that the installation of PV technology will be determined by the end users of the proposed development. At this stage, no electricity will be generated via low/zero carbon technology on the site, and the potential to export heat or electricity from the proposals to the grid or other local schemes is therefore not feasible at this stage. Further to this, no energy storage will be provided at this stage, however it is envisaged that the employment of this technology would be explored should photovoltaic technology be provided on the site in the future.

5.32 The carbon dioxide emissions for the proposed development, under the ‘Be Green’ tier of the Energy Hierarchy, are shown below. A BREL worksheet showing the ‘Be Green’ performance of the modelled spaces are provided in Appendix A2.

Figure 5.5 Non-domestic carbon dioxide emissions (Be Green)

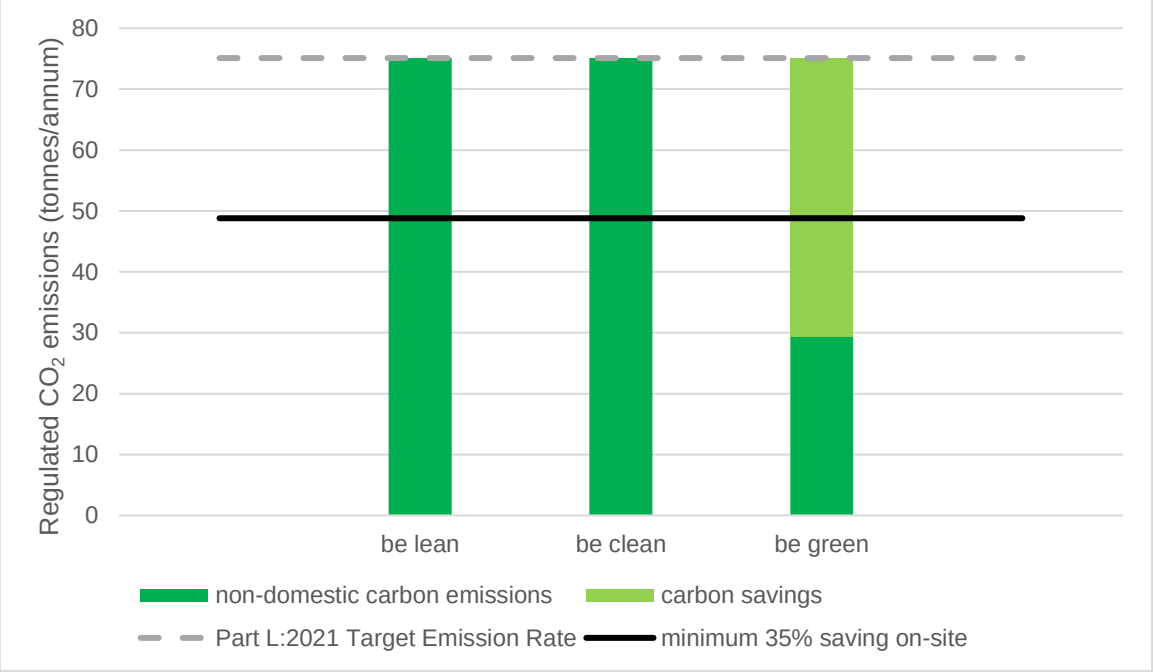


Table 5.4 Non-domestic carbon dioxide emissions (Be Green)

TER: Baseline: Part L:2021 Emissions (tonnes CO_2 per annum)	BER: Proposed Building Emissions tonnes CO_2 per annum)	Emissions Savings (tonnes CO_2 per annum)	Emissions Savings (%)
75.1	29.4	45.7	61%

5.33 The above analysis shows that the proposed non-domestic spaces will achieve a minimum on-site carbon dioxide emissions saving of 61% through energy efficiency measures and renewable technologies, under the 'Be Green' scenario.

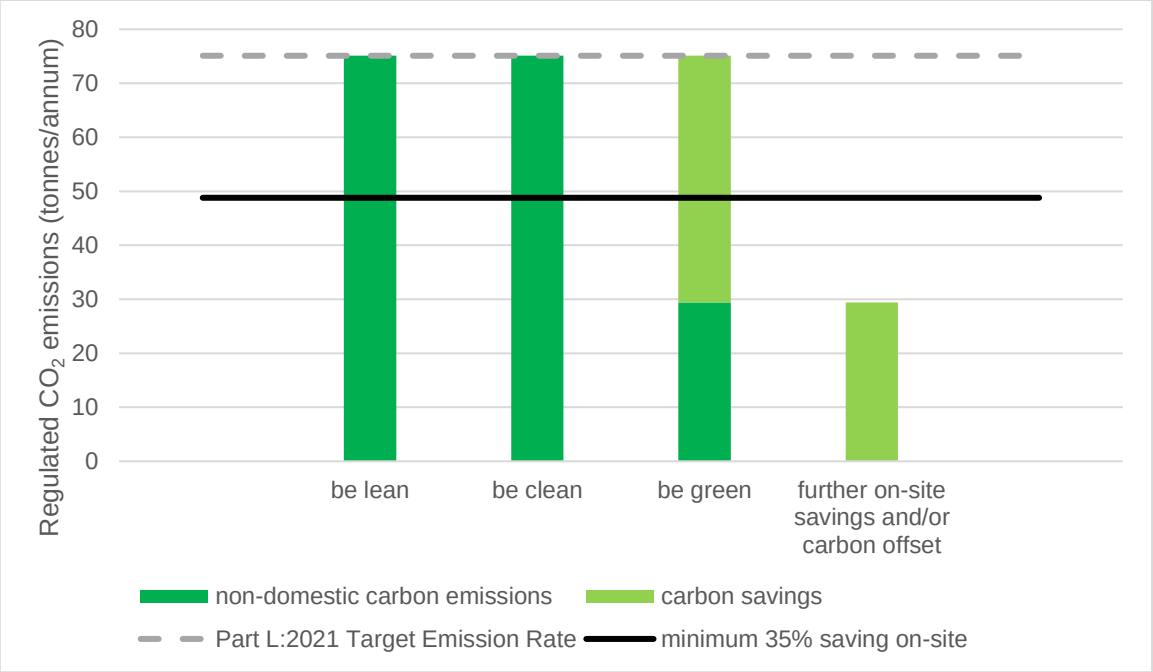
Carbon Offsetting

5.34 As per the requirements of London Plan Policy SI2, new build non-domestic buildings are expected to meet a zero-carbon target. Where the non-domestic components are unable to meet the zero-carbon target through on-site means alone, the remaining regulated carbon dioxide emissions, to 100%, are to be offset through a cash-in-lieu contribution to local authorities to be ringfenced to secure delivery of carbon dioxide savings elsewhere.

5.35 Based on the information presented in Table 5.4 above, a total of 881 tonnes of residual carbon dioxide are required to be offset from the non-domestic component over a period of 30 years. As the London Borough of Hillington do not have an established price for carbon dioxide, a figure of £95 per

tonne over a 30-year period has been used to calculate the offsetting cost. The 881 tonnes therefore result in an offset cost of £83,672.

Figure 5.6 Carbon dioxide emissions after offsetting



Monitoring and Maintenance

5.36 Suitable devices for monitoring heat and electrical consumption of the development will be installed/ the monitored data will be submitted to the Council in accordance with London Plan Policy SI2. The installation of monitoring devices and the submission and format of the data will be carried out in line with the Council's approved specifications, as indicated in the Automated Energy Monitoring Platform (AEMP) document.

5.37 On commencement of construction, contact will be made with the Council's chosen AEMP supplier to facilitate the monitoring process.

5.38 As part of the ongoing maintenance and management of the building energy systems, a contractual arrangement will be made with a recognised contractor to provide ongoing commissioning, maintenance and repair of the building systems.

6. SUMMARY

6.1 This Sustainability & Energy Statement provides an overview as to how the proposed development of the NCP Heathrow Flightpath, Bath Road, Heathrow, UB7 0DU contributes to sustainable development in the context of the strategic, design and construction considerations.

6.2 Consideration has been given to the Hillingdon Local Plan Part 1: Strategic Policies in the formulation of this statement. The overall development has been assessed using the guidance outlined in strategic objectives 8, 10, 11 and 13, and policy EM1 (Climate Change Adaptation and Mitigation) of the Local Plan, providing a holistic sustainability approach for the proposals.

6.3 By designing to rigorous energy standards and employing air source heat pump (ASHP) technology to serve the space heating and cooling demand of the proposals, the application will respond directly to the Climate Emergency declared by the Council in January 2020. These measures combine to provide a minimum carbon dioxide emissions saving of 61%, compared to the Part L:2013 baseline, significantly exceeding the requirements of London Borough of Hillingdon Council.

6.4 Sections 4 and 5 of this statement demonstrate that the siting and design of the proposals support relevant policies relating to sustainable development. This shows that the proposed development:

- will aim to achieve BREEAM certification, targeting a rating of ‘Excellent’;
- makes efficient use of land;
- will incorporate low-impact materials, according to the BRE Green Guide to Specification;
- will incorporate measures to improve site biodiversity, including native planting;
- will minimise waste production during construction and maximise the proportion of waste to be diverted from landfill;
- will minimise energy demand through the specification of low U-values and low air permeability to reduce heat loss;
- will utilise air source heat pump (ASHP) technology to serve the space heating and cooling demand of the office spaces; and
- will achieve a minimum 61% reduction in CO_2 emissions, following the Energy Hierarchy methodology, with the remaining 881 tonnes of CO_2 pe annum of non-domestic emissions from the development to be offset through a cash-in-lieu contribution.

6.5 Overall, the proposals for the scheme are in line with the principles of sustainable development as well as the policy requirements of the NPPF, the London Plan and the London Borough of Hillingdon, and will provide a development that promotes these principles in operation.

A1. SITE PLAN

1 PROPOSED SITE PLAN
1 : 250

SCHEDULE OF ACCOMMODATION GIA

		sq m	sq ft
Unit 110			
Warehouse	:	1,297	13,961
Office (Incl. GF core)	:	209	2,250
Open Mezzanine	:	266	2,863
TOTAL (GIA)	:	**1,772**	**19,074**
TOTAL (GEA)	:	**1,883**	**20,269**
Haunch Height	:	10m	
Car Parking	:	21	
Level Access	:	4	
Unit 120			
Warehouse	:	1,892	20,365
Office (Incl. GF core)	:	245	2,637
Open Mezzanine	:	119	1,281
TOTAL (GIA)	:	**2,256**	**24,284**
TOTAL (GEA)	:	**2,345**	**25,242**
Haunch Height	:	10m	
Car Parking	:	6	
Level Access	:	3	
Unit 130			
Warehouse	:	2,300	24,757
Office (Incl. GF core)	:	282	3,035
Open Mezzanine	:	143	1,539
TOTAL (GIA)	:	**2,725**	**29,331**
TOTAL (GEA)	:	**2,831**	**30,473**
Haunch Height	:	10m	
Car Parking	:	20	
Level Access	:	3	
Unit 140			
Warehouse	:	1,237	13,315
Office (Incl. GF core)	:	185	1,991
Open Mezzanine	:	187	2,013
TOTAL (GIA)	:	**1,609**	**17,319**
TOTAL (GEA)	:	**1,708**	**18,384**
Haunch Height	:	10m	
Car Parking	:	17	
Level Access	:	2	
Shared Car Parking	:	27 (incl. substation)	
Shared Cycle Space	:	50 (incl. 40 Long Stay 10 Short Stay)	
Shared Motor Cycle	:	5	
TOTAL SITE (GIA)	:	**8,362**	**90,008**
TOTAL SITE (GEA)	:	8,767	**94,367**
TOTAL CAR PARKING	:	**91**	**1:95m²GEA**
		(incl. 9 Disabled Parking & 10EV)	
SITE AREA	:	1.60 Ha / 3.95 acres	
TOTAL SITE DENSITY	:	52.26% (GIA)	

NOTES:
Copyright Chetwoods (Birmingham) Limited. No implied licence exists.
Contractors must verify all dimensions on site before commencing any work or shop drawings. This drawing is not to be scaled. Use figured dimensions only.
ubject to statutory approvals and survey.
Building areas are liable to adjustment over the course of the design process due to the ongoing construction detailing developments.
Please note the information contained within this drawing is solely for the benefit of the employer and should not be relied upon by third parties.
The CDM hazard management procedures for the Chetwoods aspects of the design of this project are to be found on the "Chetwoods - Hazard Analysis and Design Risk Assessment" and/or drawings. The full project design teams comprehensive set of hazard management procedures are available from the Principle Designer appointed for the project.

THESE DRAWINGS ARE ILLUSTRATIONS ONLY TO SHOW DESIGN INTENT.
THEY WILL NEED TO BE ADAPTED TO SUIT SPECIFIC DEVELOPMENTS/ SITE CONDITIONS
THE ARCHITECT REMAINS RESPONSIBLE FOR THEIR DESIGNS AND OBLIGATIONS.

THIS DRAWING SHOULD BE PRINTED AT FULL SIZE. SEE TITLE BLOCK FOR DRAWING SIZE. TEXT TO BE LEGIBLE WHEN PRINTED AT A3 FOR EASE OF REFERENCE ONLY.

0 5m 10m
1:250

Tree and Root Protection Area with 1250mm easment zone for fundation and draindage.

Application Site Boundary 1.6 Ha /3.95 Acres

Other land owned by the applicant 0.02 Ha/0.049 Acres

Notes:

The blue line boundary is based upon information taken from rescaled PDF tile plans MX222300 and as such the accuracy of the title information cannot be relied upon.

Existing Fence Line based on Interlocks Survers, DWG No. 210833

Tree lcocation and Root Protection Area based on Tamla Trees, Tree Protection Plan, DRG no. 03528P-TPP-04 rev. B

Please note Title Plans have been scaled using Ordnance Survey features which may have altered over time. Complete accuracy cannot be guaranteed without further on-site survey.

Any dimensions given are to be confirmed with site measure.

Layout to be trackes.

Rev	Revision Description	Date	Author/ Reviewer
PL 1	Issue for Planning	09/07/22	RC/TC

PLANNING

32 Frederick Street,
Birmingham, B1 3HH
+44 (0)121 234 7500
www.chetwoods.com

Project
Aprirose NCP Flightpath Heathrow

Client
Heathrow NCP Property Limited

Drawing Title
PROPOSED SITE PLAN

Scale	Size	Drawn	Checked	Date
As indicated	A0	RC	TC	14/06/22

Project	Originator	Zone	Level	Type	Role	Number	Rev.
5110	CA	00	00	DR	A	00060	PL 1

A2. BREL COMPLIANCE REPORTS

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

NCP Heathrow Flightpath_Be Lean

As designed

Date: Mon Jul 04 20:15:33 2022

Administrative information

Building Details

Address: NCP Heathrow Flightpath, Bath Road, Heathrow, London, UB7 0DU

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.b.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.b

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 7237

The CO_2 emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), kgCO_2/m².annum	0	
Building CO_2 emission rate (BER), kgCO_2/m².annum	4.87	
Target primary energy rate (TPER), kWh/m².annum	0	
Building primary energy rate (BPER), kWh/m².annum	42.51	
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 110 Office/si
Floors	0.18	0.16	0.16	Unit 110 Bathroom 1/f
Pitched roofs	0.16	0.16	0.16	Unit 110 Office/c
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.6	1.6	Unit 110 Office Windows East
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

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

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

^ For fire doors, limiting U-value is 1.8 W/m²K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

Building services

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

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

1- Be Lean

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.93	-	-	-	-
Standard value	0.93*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.

1- Default HWS

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	0.91	-
Standard value	0.91	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 110 Office	-	-	-	-	1.1	-	-	-	-	0.7	N/A
Unit 110 Bathroom 1	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 110 Bathroom 2	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 120 Bathroom 1	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 120 Bathroom 2	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 120 Office	-	-	-	-	1.1	-	-	-	-	0.7	N/A
Unit 130 Bathroom 1	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 130 Bathroom 2	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 130 Office	-	-	-	-	1.1	-	-	-	-	0.7	N/A
Unit 140 Bathroom 1	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 140 Bathroom 2	0.3	-	-	-	0.3	-	-	-	-	-	N/A
Unit 140 Office	-	-	-	-	1.1	-	-	-	-	0.7	N/A

Shell and core configuration

Zone	**Assumed shell?**
Unit 110 Warehouse	YES

Shell and core configuration

Zone	Assumed shell?
Unit 130 Circulation 1	YES
Unit 110 Circulation 2	YES
Unit 120 Warehouse	YES
Unit 120 Circulation 1	YES
Unit 120 Circulation 2	YES
Unit 110 Circulation 1.5	YES
Unit 120 Circulation 1.5	YES
Unit 130 Warehouse	YES
Unit 110 Circulation 1	YES
Unit 130 Circulation 2	YES
Unit 130 Circulation 1.5	YES
Unit 140 Warehouse	YES
Unit 140 Circulation 1	YES
Unit 140 Circulation 2	YES
Unit 140 Corridor 1.5	YES
Unit 110 Office	NO
Unit 110 Bathroom 1	NO
Unit 110 Bathroom 2	NO
Unit 120 Bathroom 1	NO
Unit 120 Bathroom 2	NO
Unit 120 Office	NO
Unit 130 Bathroom 1	NO
Unit 130 Bathroom 2	NO
Unit 130 Office	NO
Unit 140 Bathroom 1	NO
Unit 140 Bathroom 2	NO
Unit 140 Office	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Unit 110 Warehouse	95	-	-
Unit 130 Circulation 1	95	-	-
Unit 110 Circulation 2	95	-	-
Unit 120 Warehouse	95	-	-
Unit 120 Circulation 1	95	-	-
Unit 120 Circulation 2	95	-	-
Unit 110 Circulation 1.5	95	-	-
Unit 120 Circulation 1.5	95	-	-
Unit 130 Warehouse	95	-	-
Unit 110 Circulation 1	95	-	-
Unit 130 Circulation 2	95	-	-
Unit 130 Circulation 1.5	95	-	-
Unit 140 Warehouse	95	-	-
Unit 140 Circulation 1	95	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Unit 140 Circulation 2	95	-	-
Unit 140 Corridor 1.5	95	-	-
Unit 110 Office	95	-	-
Unit 110 Bathroom 1	95	-	-
Unit 110 Bathroom 2	95	-	-
Unit 120 Bathroom 1	95	-	-
Unit 120 Bathroom 2	95	-	-
Unit 120 Office	95	-	-
Unit 130 Bathroom 1	95	-	-
Unit 130 Bathroom 2	95	-	-
Unit 130 Office	95	-	-
Unit 140 Bathroom 1	95	-	-
Unit 140 Bathroom 2	95	-	-
Unit 140 Office	95	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 110 Warehouse	NO (-78.1%)	NO
Unit 120 Warehouse	NO (-82.9%)	NO
Unit 130 Warehouse	NO (-84.5%)	NO
Unit 140 Warehouse	NO (-70.5%)	NO
Unit 110 Office	YES (+198.3%)	NO
Unit 120 Office	YES (+7.8%)	NO
Unit 130 Office	YES (+203%)	NO
Unit 140 Office	YES (+240.1%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	7706.3	7706.3
External area [m^2]	20473.7	20473.7
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	4255.27	6707.01
Average U-value [W/m^2K]	0.21	0.33
Alpha value* [%]	68.78	32.24

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

Building Use

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

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	4.2	2.28
Cooling	0	0
Auxiliary	0.7	0.5
Lighting	21.16	12.14
Hot water	4.93	4.48
Equipment*	43.01	43.01
TOTAL**	**30.98**	**19.4**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	58.51
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*58.51*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	225.35	303.4
Primary energy [kWh/m^2]	42.51	-58.23
Total emissions [kg/m^2]	4.87	-4.71

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	131.6	75.9	0	0	0	0	0	0	0
	Notional	194.2	105.6	0	0	0	0	0	----	----
[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	195.8	289.6	65.5	0	11	0.83	0	0.93	0
	Notional	110.1	246.5	35.6	0	7.8	0.86	0	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

NCP Heathrow Flightpath_BeGreen

As designed

Date: Mon Jul 04 19:13:12 2022

Administrative information

Building Details

Address: NCP Heathrow Flightpath, Bath Road, Heathrow, London, UB7 0DU

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.b.0

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.b

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 7237

The CO_2 emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), kgCO_2/m².annum	0	
Building CO_2 emission rate (BER), kgCO_2/m².annum	3.84	
Target primary energy rate (TPER), kWh/m².annum	0	
Building primary energy rate (BPER), kWh/m².annum	41.88	
Do the building's emission and primary energy rates exceed the targets?	BER > TER	BPER > TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	Unit 110 Office/si
Floors	0.18	0.16	0.16	Unit 110 Bathroom 1/f
Pitched roofs	0.16	0.16	0.16	Unit 110 Office/c
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	1.6	1.6	Unit 110 Office Windows East
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

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

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

^ For fire doors, limiting U-value is 1.8 W/m²K

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

Building services

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

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

1- Be Green

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4	5	-	1.1	0.7
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- Instantaneous Hot Water

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
Unit 110 Bathroom 1	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 110 Bathroom 2	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 120 Bathroom 1	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 120 Bathroom 2	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 130 Bathroom 1	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 130 Bathroom 2	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 140 Bathroom 1	0.3	-	-	-	-	-	-	-	-	-	N/A
Unit 140 Bathroom 2	0.3	-	-	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	**Assumed shell?**
Unit 110 Warehouse	YES
Unit 130 Circulation 1	YES
Unit 110 Circulation 2	YES
Unit 120 Warehouse	YES

Shell and core configuration

Zone	Assumed shell?
Unit 120 Circulation 1	YES
Unit 120 Circulation 2	YES
Unit 110 Circulation 1.5	YES
Unit 120 Circulation 1.5	YES
Unit 130 Warehouse	YES
Unit 110 Circulation 1	YES
Unit 130 Circulation 2	YES
Unit 130 Circulation 1.5	YES
Unit 140 Warehouse	YES
Unit 140 Circulation 1	YES
Unit 140 Circulation 2	YES
Unit 140 Corridor 1.5	YES
Unit 110 Office	NO
Unit 110 Bathroom 1	NO
Unit 110 Bathroom 2	NO
Unit 120 Bathroom 1	NO
Unit 120 Bathroom 2	NO
Unit 120 Office	NO
Unit 130 Bathroom 1	NO
Unit 130 Bathroom 2	NO
Unit 130 Office	NO
Unit 140 Bathroom 1	NO
Unit 140 Bathroom 2	NO
Unit 140 Office	NO

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Unit 110 Warehouse	95	-	-
Unit 130 Circulation 1	95	-	-
Unit 110 Circulation 2	95	-	-
Unit 120 Warehouse	95	-	-
Unit 120 Circulation 1	95	-	-
Unit 120 Circulation 2	95	-	-
Unit 110 Circulation 1.5	95	-	-
Unit 120 Circulation 1.5	95	-	-
Unit 130 Warehouse	95	-	-
Unit 110 Circulation 1	95	-	-
Unit 130 Circulation 2	95	-	-
Unit 130 Circulation 1.5	95	-	-
Unit 140 Warehouse	95	-	-
Unit 140 Circulation 1	95	-	-
Unit 140 Circulation 2	95	-	-
Unit 140 Corridor 1.5	95	-	-
Unit 110 Office	95	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Unit 110 Bathroom 1	95	-	-
Unit 110 Bathroom 2	95	-	-
Unit 120 Bathroom 1	95	-	-
Unit 120 Bathroom 2	95	-	-
Unit 120 Office	95	-	-
Unit 130 Bathroom 1	95	-	-
Unit 130 Bathroom 2	95	-	-
Unit 130 Office	95	-	-
Unit 140 Bathroom 1	95	-	-
Unit 140 Bathroom 2	95	-	-
Unit 140 Office	95	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Unit 110 Warehouse	NO (-78.1%)	NO
Unit 120 Warehouse	NO (-82.9%)	NO
Unit 130 Warehouse	NO (-84.5%)	NO
Unit 140 Warehouse	NO (-70.5%)	NO
Unit 110 Office	YES (+198.3%)	NO
Unit 110 Bathroom 1	N/A	N/A
Unit 110 Bathroom 2	N/A	N/A
Unit 120 Bathroom 1	N/A	N/A
Unit 120 Bathroom 2	N/A	N/A
Unit 120 Office	YES (+7.8%)	NO
Unit 130 Bathroom 1	N/A	N/A
Unit 130 Bathroom 2	N/A	N/A
Unit 130 Office	YES (+203%)	NO
Unit 140 Bathroom 1	N/A	N/A
Unit 140 Bathroom 2	N/A	N/A
Unit 140 Office	YES (+240.1%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	7706.3	7706.3
External area [m^2]	20473.7	20473.7
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	4255.27	6707.01
Average U-value [W/m^2K]	0.21	0.33
Alpha value* [%]	68.78	32.24

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

Building Use

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

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	0.93	0.74
Cooling	1.11	1.28
Auxiliary	0.7	0.07
Lighting	21.16	12.14
Hot water	4.48	4.48
Equipment*	43.01	43.01
TOTAL**	**28.39**	**18.72**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	52.97
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*52.97*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	220.77	300.06
Primary energy [kWh/m^2]	41.88	-50.27
Total emissions [kg/m^2]	3.84	-4.26

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	131.6	75.9	0	0	0	0	0	0	0
	Notional	194.2	105.6	0	0	0	0	0	----	----
[ST] Variable refrigerant flow, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	201.3	212.7	14.6	17.4	11	3.84	3.4	4	5
	Notional	109.5	194.9	11.5	20.1	1.1	2.64	2.7	----	----

Key to terms

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

A3. RENEWABLE ENERGY FEASIBILITY ASSESSMENT

A3.1 In line with GLA London Plan requirements, a feasibility assessment of potential renewable energy technologies has been undertaken, and the results from this are presented below.

Technology	Appraisal	Included in Development?
Biomass	This technology is not considered a practical solution for reducing carbon dioxide emissions, in the view of storage space requirements for the combustible material, accessibility of the site for regular deliveries of the material and the transport related carbon emissions which are not normally accounted for within energy modelling. Furthermore, high nitrous oxide (NOx) and particulate matter (PMx) emissions are associated with the use of biomass fuel, and as the proposed development falls within an Air Quality Management Area (AQMA), permitted emissions will be restricted.	✗
Air source heat pump	This technology is deemed appropriate to provide both space heating and cooling to the office spaces within the proposed dwellings. Full details of the proposed system efficiencies and associated carbon dioxide savings are provided in Section 5.	✓
Ground source heat pump	Ground investigation and borehole drilling are likely to be cost prohibitive and may not yield a suitable energy source. In addition to this, the carbon dioxide and energy cost savings arising from the use of this technology are unlikely to be significant when compared to that of the energy efficient gas-fired boilers proposed for the development, particularly as high-grade heat is required to generate domestic hot water. The use of ground source heat pumps for the proposed development is therefore not considered viable, and it is intended that air source heat pump (ASHP) technology will be employed instead.	✗

Photovoltaics (PV)	Whilst the use of this technology is appropriate for the proposed development, the weight loading of PV panels on roof structures is likely to lead to additional structural requirements for the scheme, adding complexity and cost. For the purposes of this Energy Strategy, the use of PV technology has therefore not been specified. However, should this technology be incorporated in the future, details of its location, efficiency, outputs and associated carbon dioxide emissions savings should be provided as part of a Reserved Matters Application.	
Solar thermal hot water (STHW)	This technology is presently rejected as hot water is proposed to be provided by highly efficient direct electric point of use water heaters. In addition to this, hot water demand is considered to be outside the energy generating period for the solar thermal panels, meaning its ability to significantly reduce carbon emissions during operation is limited. For the purposes of this Energy Strategy, the use of STHW technology has therefore not been specified. However, should this technology be incorporated in the future, details of its location, efficiency, outputs and associated carbon dioxide emissions savings should be provided as part of a Reserved Matters Application.	
Wind turbines	This technology is rejected on the basis of its potential impact on visual amenity and relatively low efficiency from unpredictable, turbulent wind conditions in urban locations.	

A4. GENERAL NOTES

A4.1 The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Iceni Projects Ltd for inaccuracies in the data supplied by any other party.

A4.2 The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.

A4.3 No site visits have been carried out, unless otherwise specified.

A4.4 This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in guidance may necessitate a re-interpretation of the report in whole or in part after its original submission.

A4.5 The copyright in the written materials shall remain the property of Iceni Projects Ltd but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to Iceni Projects Ltd by the client of the outstanding amounts.

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