

6.0 **Environmental Sustainability Plan**

Environmental Sustainability Plan

Zone A Building

King's Cross Central General Partner Ltd
and Google UK Limited

March 2022

King's Cross



Environmental Sustainability Plan

King's Cross Central: Zone A Building

10 March 2022

Confidential

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Contents

1	Introduction	1
2	Executive Summary	1
2.1	Condition 17(A): Energy efficiency measures	3
2.2	Condition 17(B): Reduction in carbon emissions	4
2.3	Condition 17(C): Provision of green and/or brown roofs	4
2.4	Condition 17(D): Energy supply	4
2.5	Condition 17(E): BREEAM rating	4
2.6	Condition 17(F): Wildlife features	5
2.7	Condition 45: Drainage	5
2.8	S106 – Section AA: Water	5
2.9	S106 – Section Y: Construction materials and waste	6
2.10	S106 – Section Z: Waste	6
3	Response to Planning Conditions	7
3.1	Condition 17(A): Energy efficiency measures	7
3.1.1	Overview	7
3.1.2	Passive Design	7
3.1.3	Active Design	10
3.2	Condition 17(B): Reduction in carbon emissions	14
3.3	Condition 17(C): Provision of green and/or brown roofs	16
3.4	Condition 17(D): Energy supply	18
3.4.1	Carbon emission savings from the District Heating Network	18
3.4.2	Carbon emission savings from renewable technologies	19
3.4.3	Assessment of available renewable technologies	20
3.5	Condition 17(E): BREEAM rating	22
3.5.1	BREEAM overview	22
3.5.2	LEED Overview	25
3.6	Condition 17(F): Wildlife features	27
3.7	Condition 45: Drainage	28
3.7.1	Site wide drainage infrastructure	28
3.7.2	Drainage infrastructure relating to Plots A1 to A5	30
4	Response to S106 Obligations	31
4.1	S106 – Section AA: Water	31
4.1.1	Water Efficiency	31
4.1.2	Alternative Water Supplies	31
4.1.3	Sustainable Urban Drainage (SuDS)	32
4.2	S106 – Section Y: Construction materials and waste	33

4.2.1	Construction Materials and Purchasing Strategy	33
4.2.2	Materials Health and Transparency	34
4.2.3	Packaging Waste	34
4.2.4	Soil	34
4.3	S106 – Section Z: Waste	35
4.3.1	Waste Information Packs	35
4.3.2	Design Solutions	35

Appendices 36

A.	Part L Analysis	37
A.1	Overview	37
A.2	Building model and operational parameters	38
A.3	Carbon emission reduction calculation	39
B.	BREEAM Pre-assessment (Offices)	41
C.	BREEAM Pre-assessment (Retail)	42
D.	LEED Pre-assessment (Offices)	43
E.	LEED Pre-assessment (Retail)	44
F.	Environmental Sustainability Plan Addendum	45

1 Introduction

Mott MacDonald has been instructed to produce an Environmental Sustainability Plan to accompany the Revised Reserved Matters Submission for the proposed Zone A Building occupying the whole of Development Zone A within the King's Cross Central (KXC) development site in North London. This submission proposes minor amendments to the Zone A building for which Reserved Matters were approved first in August 2017 (Ref: 2017/3133/P). The majority of these strategies remain unaffected by the revised scheme and where they are affected it is a negligible change.

In particular, this document provides information in response to planning conditions 17, 45 and 48 of the aforementioned planning permission, providing details of the strategies included in the design proposals with a view to achieve a very high standard of sustainability. Furthermore, it details how relevant obligations included within sections AA, Y and Z of the S106 Agreement will be met.

This Environmental Sustainability Plan is to be read in conjunction with and in the context of all the other documents accompanying the planning application submission for the proposed Zone A Building, including the Urban Design Report (UDR) and the Planning Compliance Report. This Plan also includes the BREEAM and LEED pre-assessments undertaken for the development. These are addressed in Section 3.5 herein and further details are given in Appendix B, C and D.

An Addendum has been included in Appendix F. This document summarises the changes to facade performance and demonstrates that these changes have no adverse impact to the overall energy performance of the whole building as presented in the original Reserved Matters application. Please note that this document supersedes the following sections of this Environment Sustainability Plan and should be referred to in their place:

- Section 2.1
- Section 2.2
- Section 2.4
- Section 3.1
- Section 3.2
- Section 3.4
- Appendix A

2 Executive Summary

The Zone A Building is located in the southern part of the main site of the King's Cross Central (KXC) development site. King's Cross Central (KXC) is an area to the north of King's Cross and St. Pancras Stations, which has been redeveloped over the last decade as a mixed use urban neighbourhood.

The Zone A Building occupies a prominent location in the southern half of the KXC development site. It is wedged between King's Cross Station and its railway track, to the east, and the King's

Boulevard, to the west. The German Gym, the Stanley Building, and Buildings B2, B4 and B6, all of which have been approved and are now occupied, line the western side of the King's Boulevard. The Eastern Goods Yard ('EGY'), which includes the Granary Building and Granary Square, lie to the north of the Regent's Canal and Goods Way.

The proposed Zone A Building comprises a single, predominantly office building of 7 to 11 storeys, above retail uses at ground floor and two levels of basement. The office use will include ancillary uses for 4,500 members of staff and their visitors, including cafes, gym and pool facilities, a covered multi-use games area (MUGA), an events centre and staff training facilities. At roof level, landscaped terraces and a walking 'Trim Track' will provide outdoor amenity and recreation space for employees. The existing access ramp will provide service access to the basement areas, as well as to the existing Shared Service Yard. The Zone A Building will provide accommodation for Google UK Ltd's UK Headquarters, with a mix of different retailers at ground floor.

The proposed building will provide a total floorspace of 80,877 m² (GEA), excluding basement. Of this, 76,137 m² will be office space, and a further 3,426m² is attributable to A1 units at ground floor level with 1,008m² GEA allocated for D1 use. The basement floorspace, which is spread across two levels, will equal 11,054 m².

The project team for Zone A has worked closely with the Applicants, King's Cross Central General Partners Ltd. (KCCGPL) and the prospective occupier, Google UK Ltd, to realise a very high standard of sustainability and a high-quality environment for its staff and visitors. The approach taken for every aspect of the proposed building's design includes passive and active measures to maximise the building's sustainability.

As a new commercial development, the Zone A Building will be subject to the requirements of Schedule 1 of the Building Regulations. In particular, all envelope, fittings, HVAC and lighting equipment will need to show compliance with *Part L: Conservation of Fuel and Power* of Schedule 1. Approved Document Part L2A, 2013 edition incorporating 2016 amendments will be used as reference to meet these requirements. This document is referred to as Part L 2013 throughout this document.

The combination of passive design and very energy efficient measures and the sourcing of heat and power from the low-carbon district energy system result in a very high overall annual carbon reduction of 22.0% compared to the prevailing Building Regulations (Part L 2013) baseline.

Other key environmental sustainability measures include grey water recycling, rainwater attenuation and reuse via a blue roof system, low flow water fittings, greenery and amenity rooftop facilities for staff, thorough energy and water metering and monitoring and use of materials with a low environmental impact.

The building has already been registered and is being assessed under the BREEAM (Building Research Establishment Environmental Assessment Method) 2014 New Construction scheme. Furthermore, even though not required under the Outline Planning Permission, the project has also been registered and will be assessed against LEED (Leadership in Energy and Environmental Design) v4, an internationally recognised certification programme for green buildings. The project team is committed to achieving BREEAM and LEED ratings of 'Excellent' and 'Gold' respectively, but with an aspiration to achieve higher 'Outstanding' and 'Platinum' ratings.

The main environmental and sustainability measures that are proposed are summarised below.

2.1 Condition 17(A): Energy efficiency measures

Passive Design

- Heat losses are limited across the building via a compact building form.
- Glazing specification has been selected in line with solar exposure analysis and dynamic thermal simulation, in order to provide adequate levels of solar control (low g-value) and visible light transmittance (VLT). This strategy is expected to reduce cooling, heating and artificial lighting demands.
- Solar heat gains are reduced in summer via appropriate shading measures (overhangs, vertical solid timber fins and internal shading incorporating a two-blind system). This strategy is also expected to reduce glare discomfort while maintaining high levels of internal daylight.
- Bespoke construction details are designed to reduce the risk of uncontrolled infiltration.
- Heat losses are reduced due to thermal bridges by developing bespoke construction details for critical element junctions.
- The ceilings of the building will feature an exposed concrete soffit ceiling that can act as thermal mass helping stabilising the internal temperatures by flattening daily cooling load peaks.
- The specification of the envelope ensures compliance with the prevailing Building Regulations (Part L 2013) for new non-domestic buildings. The U-values adopted at this early design stage meet or exceed the minimum Part L 2013 requirements.
- Green roofs are incorporated as a means to achieve the targeted U-values and help reduce the urban heat island effect.

Active Design

- Energy efficient lighting will be installed throughout the building. The majority of internal light fittings will be energy efficient light-emitting diode (LED) with advanced demand-led controls (daylight dimming sensors to utilise natural daylight, occupancy sensors, time control option for all internal and external lighting).
- Air distribution system will meet high levels of airtightness and fan power efficiency.
- Highly efficient supply and extract fans and pumps with variable speed motors with multiple pressure sensors will be specified.
- Separate accessible energy sub-meters will be installed to facilitate the monitoring of substantial energy uses and high energy demand areas within the building.
- A building management system (BMS) will be installed to monitor and control the building services, thus minimising energy-inefficient operation
- The mechanical ventilation strategy will allow high levels of heat recovery from the exhaust air to be used to heat the supply air, thus dramatically minimising the need for additional heating in winter. Ventilation will be provided from centralised dedicated air handling units (AHU) utilising a thermal wheel to reclaim heat and coolth from the exhaust air that would otherwise be lost to atmosphere.
- The AHUs can be used in free cooling mode when the external conditions are adequate.
- Demand control ventilation based on CO₂ and occupancy sensing. The ventilation system will be provided with damper controls based on gas sensors.
- Space heating and domestic hot water (DHW) will be provided from the local King's Cross District Heating Network.
- Space cooling will be provided from energy efficient water-cooled chillers.
- Energy-efficient lifts will be installed to reduce transport-related energy consumption.

2.2 Condition 17(B): Reduction in carbon emissions

- Through the building design and technology energy efficiency measures the building is able to reduce the annual regulated CO₂ emissions by 129.3tCO₂/year, which equates to 6.1% carbon savings compared to the emissions permitted under the prevailing Building Regulations (Part L 2013). This complies with the requirements set by Obligations 6 and 7 of Section X of the S106 Agreement (at least 5% lower than Part L of the prevailing Building Regulations, using good passive design and energy efficiency measures only)
- Carbon savings achieved through the building design and technology energy efficiency measures along with the incorporation of a photovoltaic array with an output of 19,800 kWh annually on the roof (disregarding the carbon savings that will be achieved by utilising the low carbon local district energy system) are 6.5% compared to the prevailing Building Regulations (Part L 2013) baseline.

2.3 Condition 17(C): Provision of green and/or brown roofs

- Although Development Zone A has not been identified as a priority zone for green and/or brown roofs on Parameter Plan KXC 021 of the Outline Planning Permission, accessible landscaped areas for staff and visitors are proposed at roof level.
- The landscaped terraces cover an area of 9,492 m² with a balance of 60% hard landscape and 40% soft landscape. The soft area on the roof is approximately 3,779m² which includes lawn and wildflower planting.
- The roof landscape design includes four main character areas/levels. The potential to enhance biodiversity and attract wildlife has been considered and incorporated in the design.

2.4 Condition 17(D): Energy supply

- The connection to the low-carbon district energy supply system will allow the Zone A Building to take advantage of the low-carbon benefits associated with combined heat and power. The district energy system will meet all of the heating and hot water demand for the office building. Heating, cooling and domestic hot water for each retail unit will be provided by the tenant.
- The combined heat and power (CHP) engines within the Energy Centre will also generate electrical power, which will offset a significant percentage of the building's demand.
- The Energy Centre will include: 3No. 1.8MW_{th} gas fired CHP, a thermal store integral to the CHP operating hours strategy and 3No. 9MW_{th} gas boilers.
- The use of a low-carbon energy supply and the building design and technology energy efficiency measures as described under Section 3.1 herein result in the Zone A Building achieving an overall reduction in CO₂ emissions of 21.5% against the Part L 2013 TER.
- A photovoltaic array with an output of 19,800 kWh annually is proposed on the roof, contributing to a further 0.5% carbon reductions against Part L 2013.
- In total, the proposed design achieves 22.0% carbon savings compared to the prevailing Building Regulations (Part L 2013) baseline.

2.5 Condition 17(E): BREEAM rating

- The proposed KXC Zone A development has been registered and is being assessed under the BREEAM New Construction 2014 scheme.
- The proposed Zone A Building should go beyond planning requirements set out by Condition 17(E) (at least a 'Very Good' rating), targeting a rating of 'Excellent' for the general office

areas, with an aspirational rating of 'Outstanding' to be achieved upon completion, and 'Good' for the retail 'Shell-only' parts of the building, with an aspirational rating of 'Excellent'.

- The pre-assessment undertaken by the BREEAM assessor indicates a current predicted score of 86.64% (i.e. an 'Outstanding' rating) for the general office areas. The updated pre-assessment for the retail 'Shell-only' areas indicates a current predicted score of 47.36% (i.e. a 'Good' rating)..
- Although LEED is not referred to in Condition 17(E), Google UK Limited has requested that the KXC Zone A Building is tested against these additional standards, in line with their corporate standards, with a view to achieving the highest possible rating (i.e. 'Platinum').
- The KXC Zone A development has also been registered and will be assessed under the LEED v4 for Building Design and Construction (LEED v4 BD-C) scheme.
- The initial pre-assessment undertaken by the appropriate consultant indicated a predicted score of 74 points for the retail fit-out, equivalent to a 'Gold' rating, with the aspirational highest rating of 'Platinum' to be achieved on completion.

2.6 Condition 17(F): Wildlife features

- Proposals for vegetated areas at roof level are expected to enhance the ecological value of the site, providing new habitats that will have the potential to attract wildlife.
- The soft area on the roof is approximately 3,779m² which includes lawn and wildflower planting.
- The Plateau level of the roof landscape proposals has been designed with a view to enhance biodiversity, with the use of meadows, woodland floor planting and points of rainwater collection to attract wildlife, such as insects and birds, and the installation of beehives.
- A wide band of trees and tall shrubs will line the western edge protecting wildlife and people from dominant south-west winds.
- Further advice will be sought from a qualified ecologist regarding bird and bat species that are present in the area and potential proposals for suitable type of boxes to be installed on site.

2.7 Condition 45: Drainage

- The peak water discharge flows for the Zone A development are 632l/s and 33.1/s for surface water and foul water respectively.
- The drainage networks have been designed on SUDS principles providing an overall peak flow reduction of 10% (based on a 1 in 30-year storm).
- The drainage infrastructure of the Zone A development has been designed so that the permissible discharges set out in the Outline Planning Permission are not exceeded.

2.8 S106 – Section AA: Water

- High standards of water efficiency are targeted through the specification of efficient water consuming components, such as low flow dual flush WCs, and the inclusion of a greywater system.
- Consumption is expected to be reduced by 60% against typical water consumption and result in all available credits being achieved under the relevant BREEAM category.
- Specification of a greywater recycling system is included in the proposals to offset non-potable water uses by serving the WC flushing.

- A blue roof system is proposed for rainwater collection and reuse for irrigation at the point of collection. The efficient irrigation system in conjunction with the selection of native/adapted vegetation is expected to reduce potable water use for external landscaping by 50%.
- The blue roof system will also retain water at the roof level, acting as a stormwater attenuation measure. The blue roof system will help mitigate flood risk on-site.

2.9 S106 – Section Y: Construction materials and waste

Under BREEAM, the project is targeting two credits for construction resource efficiency, which means that the appointed principal contractor must achieve a benchmark of 6.5 tonnes or less of waste generated per 100 m² (gross internal floor area).

A target for the diversion of waste from landfill has also been set in line with the BREEAM requirements, which is at least 80% (by tonnes) of non-hazardous construction waste is diverted from landfill.

2.10 S106 – Section Z: Waste

BREEAM criteria recommend that based upon the size of the development, at least 20m² of floor area should be dedicated to the storage of operational recyclable waste volumes, in addition to any storage for general waste. Current plans indicate that the actual provision will exceed this target meaning that there will be more than sufficient capacity to store the development's operational waste volumes. There will be storage containers for multiple recyclable waste streams, including mixed paper, corrugated cardboard, glass, plastics, and metals, as required by the LEED criteria.

3 Response to Planning Conditions

3.1 Condition 17(A): Energy efficiency measures

“The Environmental Sustainability Plan shall explain how the proposed building design(s) realise(s) opportunities to include design and technology energy efficiency measures.”

3.1.1 Overview

The Zone A Building has been designed with energy efficiency being one of the key drivers from the outset.

Whilst the offsetting of CO₂ emissions associated with the electrical energy, heating and hot water consumption of the building will be provided via the low-carbon district energy system, the project team recognises the need to reduce the energy demand and consumption of the Zone A Building when in use through the application of the following design methodologies:

- **Passive Design:** The use of the building form and structure (thermal mass) as well as highly efficient façade systems which have been designed in consideration of the orientation and sun angles in order to reduce cooling loads and artificial lighting energy demand.
- **Active Design:** The specification of energy efficient equipment (e.g. intelligent and energy efficient lighting systems, mechanical ventilation with heat recovery, variable speed pumping, etc.), all monitored and controlled by a Building Energy Management System (BEMS) to maximise energy efficient operation of the Zone A Building.

By embracing passive and active design measures, the Zone A Building will also be ‘future-proofed’ to ensure it is adaptable to climate change and the future operational needs of the tenant, and is capable of accommodating future low/zero carbon technologies.

3.1.2 Passive Design

3.1.2.1 Building form and context

The Zone A Building occupies a prominent location in the southern half of the KXC development site. It is wedged between King's Cross Station and its railway track, to the east, and the King's Boulevard, to the west. The German Gym, the Stanley Building, and Buildings B2, B4 and B6, all of which have been approved and are now occupied, line the western side of the King's Boulevard. The Eastern Goods Yard ('EGY'), which includes the Granary Building and Granary Square, lie to the north of the Regent's Canal and Goods Way.

The King's Cross railway lines are located at a lower level enabling the whole East elevation to benefit from solar heat gains during the heating season, daylight and external views. Buildings located on the opposite side of the King's Boulevard will block part of the incoming solar gains and daylight from the west, during the afternoons and evenings.

The adjacent buildings have been taken into consideration when designing the proposed building facade, maximising the incoming daylight and controlling solar gains in relation to the seasons (i.e. heating or cooling) and orientation.

The compact building form of the Zone A Building results in minimum exposed external envelope area, thereby limiting heat losses across the building.

3.1.2.2 Façade design and fabric specification

The shape of the plot creates two large glazed facades facing East and West. In order to minimise excessive solar gains in summer, the building design incorporates solar control glass and appropriate shading measures (overhangs, vertical solid timber fins and internal shading), resulting in reduced cooling loads in the summer, while maintaining a comfortable indoor environment.

The glazing specification has been selected for each façade orientation in line with solar exposure analysis and dynamic thermal simulation, in order to provide adequate levels of solar control (low g-value) and visible light transmittance (VLT). This strategy is expected to reduce cooling, heating and artificial lighting demands.

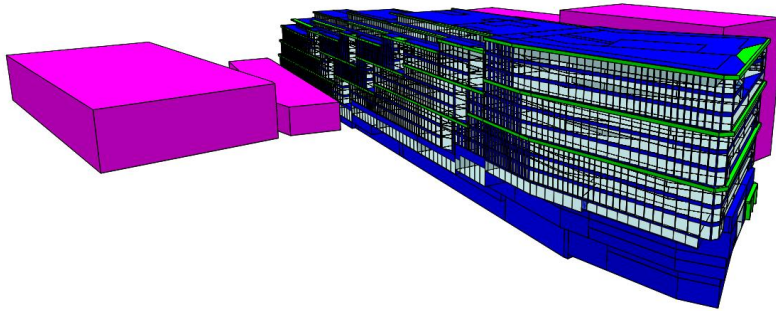
The solid vertical wooden panels have been placed in the façade at office levels, to reduce solar gains and glare discomfort. Internal shading is provided to further reduce potential glare into the office areas. A two-blind system has been designed to provide increased daylight to the space. A top down deployed blind will reduce the potential for glare from direct sunlight, whilst a bottom up blind, with greater transparency, will reduce glare from indirect sources, all the while maintaining high levels of internal daylight.

The above design measures have been incorporated to allow adequate daylight into the building, reducing the dependence on artificial lighting and providing clear views out.

Heat losses are mitigated with the specification of triple glazed panels in the main office areas of the building and double glazing for the roof-top amenity spaces. The roof and external walls feature highly efficient thermal insulation, whilst green roofs are provided to achieve the targeted U-values and help reduce the urban heat island effect. The specification of the envelope ensures compliance with the prevailing Building Regulations (Part L 2013) for new non-domestic buildings. The U-values adopted at this early design stage meet or exceed the minimum Part L2A 2013 requirements (Table 1).

Bespoke construction details will be designed to reduce the risk of uncontrolled infiltration and achieve a design air permeability of $3\text{m}^3/\text{hr}/\text{m}^2 @ 50\text{Pa}$. Additionally, heat losses from thermal bridges will be reduced by developing bespoke construction details for critical element junctions.

Figure 1: 3D thermal model (IES VE 2015)



Source: Atelier Ten

Table 1: Limiting Part L 2013 and proposed envelope parameters

Building Envelope	Part L2A limiting U-values	Proposed U-values	Window g-values	Window light transmittance
External wall	0.35 W/(m ² .K)	0.25 W/(m ² .K)		
Basement wall	0.25 W/(m ² .K)	0.25 W/(m ² .K) ¹		
Roof	0.25 W/(m ² .K)	0.25 W/(m ² .K)		
Ground floor	0.25 W/(m ² .K)	0.25 W/(m ² .K)		
Basement floor	0.25 W/(m ² .K)	0.25 W/(m ² .K) ²		
Opaque curtain wall elements	2.20 W/(m ² .K)	1.20 W/(m ² .K) ³		
Window office	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.24	0.45
Window amenity	2.20 W/(m ² .K)	1.60 W/(m ² .K)	0.28	0.55
Window ground floor (East)	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.18	0.40
Window ground floor (North/West/South)	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.38	0.70
Window retail	2.20 W/(m ² .K)	1.60 W/(m ² .K)	0.38	0.70

Source: Atelier Ten

¹ U-value calculated without the insulating effect of the soil.

² U-value calculated without the insulating effect of the soil.

³ The solid wooden panels between windows are considered part of the frame and are thus compared against the limiting U-value for a window.

3.1.2.3 Thermal mass

The ceilings of the building will feature an exposed concrete soffit ceiling that can act as thermal mass, helping to stabilise the internal temperatures by flattening daily cooling peak loads. Thermal mass absorbs heat from its surroundings, thereby resulting in occupants feeling cooler during the warmer days of the year.

Night time ventilation/cooling allows the building to benefit from thermal mass by purging the heat stored within the thermal mass during the day. This allows for a reduction of daily peak cooling loads and therefore, annual cooling demand and consumption. However, it is to be noted that the potential for the implementation of an appropriate and effective cooling strategy will be subject to operational usage constraints.

3.1.3 Active Design

3.1.3.1 BMS

A Building Management System (BMS) will be provided to control and monitor the building engineering systems and services throughout the development, provide feedback of plant, system performance, monitoring and energy management of the system. The BMS will analyse this data to enable optimum use of the engineering facilities within the development with minimum of human intervention, and with the minimum of energy consumption.

The BMS will operate on the converged IP network provided by Google (NetOps), with controllers/outstations also configured to the same network. It is envisaged the BMS system will be linked to the central Google facilities control centre in Mountain View alongside other similar facilities in Europe (should they be developed).

3.1.3.2 Ventilation systems

A mechanical ventilation strategy is proposed for the Zone A Building.

Ventilation will be provided from centralised dedicated air handling units (AHU) utilising a highly efficient heat recovery system to recover heat and coolth from the exhaust air that would otherwise be lost to atmosphere. Therefore, the high levels of heat recovery from the exhaust air will be used to heat the supply air, thus dramatically minimising the need for additional heating in winter.

Fresh air intake and supply air distribution ductwork will be thermally insulated and will meet high levels of airtightness and fan power efficiency. Highly efficient supply and extract fans and pumps with variable speed motors and multiple pressure sensors will be specified.

Very high ventilation rates of 16 litres/second/person will be provided for the occupied spaces, beyond CIBSE good practice standard of 10 litres/s/p, and beyond British Council for Offices (BCO) recommendation of 12 litres/s/p, to encourage health and wellbeing of occupants. The specific fan power of the AHUs will be 2.0 W/(l/s) and the specific fan power of the Fan Coil Units (FCU) and trench units will be 0.15 W/(l/s).

In large spaces, such as perimeter offices (including meeting rooms), lobbies and event spaces, AHUs will supply tempered fresh air to a ducted underfloor system. This method of air distribution fits well in with the double and triple height spaces of the Zone A Building, providing tempered air close to the occupied (lower) space.

The underfloor air supply ventilation solution provides additional benefits, including producing minimal air movement and providing good thermal comfort in the occupied levels, whilst

reducing energy usage. The latter is achieved by conditioning only the occupied part of each space at low level and by the fact that the underfloor supply air is of an elevated temperature compared to conventional systems. This approach will result in very low annual cooling energy consumption for a building of this scale.

In the Wellness and Fitness Centre and staff café areas and kitchens, dedicated AHUs will distribute fresh air to individual Variable Air Volume (VAV) boxes, linked to temperature and carbon dioxide sensors within those spaces so as to ensure efficient delivery of fresh air.

The AHUs can also be used in free cooling mode when the external conditions are adequate.

All the AHUs will interface with a Building Management System (BMS) in order to monitor and control the building services, thus avoiding energy-inefficient operation.

Office Ventilation

Upon receipt of a demand signal (either occupied period from time clock or manual command from BMS operator's station), the BMS shall enable each associated AHU. Motorised dampers will be commanded open. Once end switches are made, the supply and extract fans shall be run. The BMS will modulate heat recovery wheels, recirculating dampers, heating and cooling coil valves as necessary to maintain the respective supply air temperature and CO₂ setpoints. The AHU control functions will include morning boost, cool down and frost protection routines, as well as standard operation.

Each AHU will be individually metered.

Ground Plane, Basement and Amenity Space Ventilation

Upon receipt of a demand signal, the BMS shall enable each associated AHU. Motorised dampers will be commanded open. Once end switches are made, the supply and extract fans shall be run. The BMS will modulate heat recovery wheels, recirculating dampers, heating and cooling coil valves as necessary to maintain the respective supply air temperature and CO₂ setpoints.

Each AHU will be individually metered.

Toilet Extract

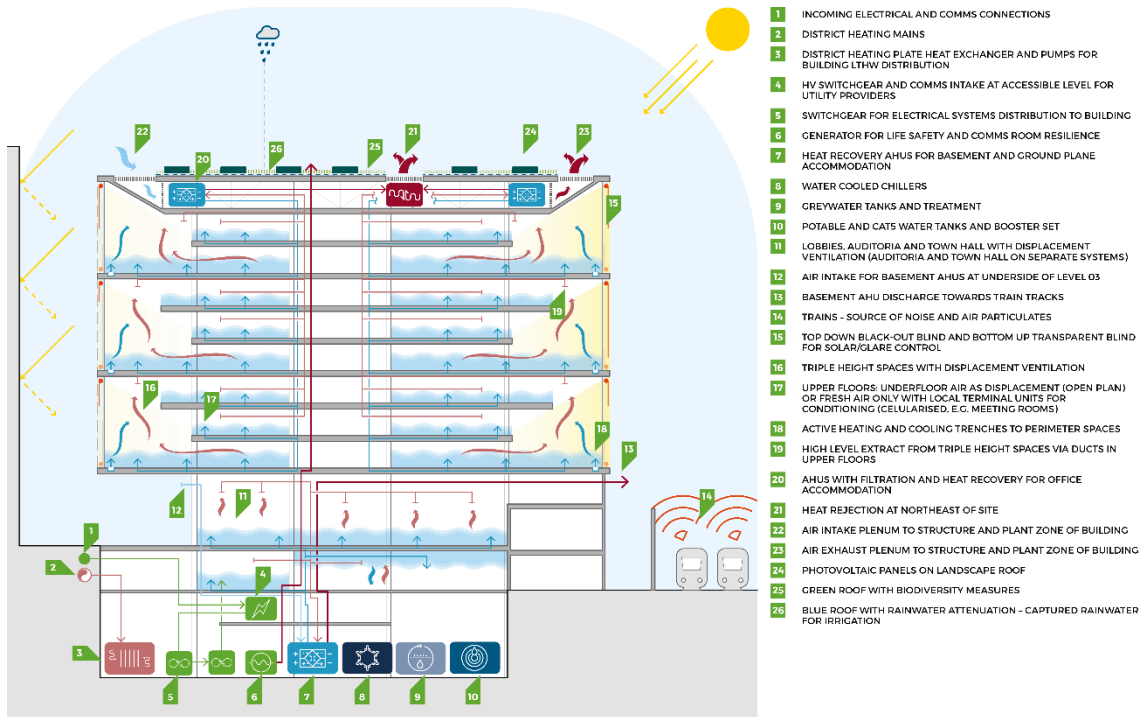
Toilet extract fans will operate as variable volume with inverter drive, modulated to maintain a differential pressure set point at the base of the respective riser. Motorised dampers in the duct branches on each floor will switch between partially open (background vent) when the space is unoccupied and fully open (boost) when the passive infrared sensor (PIR) in the common lobby on each floor is activated.

Each fan will be individually metered.

Perimeter Trench Units, Fan Coils and Downflow Units (CRAC units)

Units will each be provided with unitary controllers to modulate fan speed and heating and cooling coil valve actuator positions. Temperature sensors will be provided on both intake and discharge side of each unit. The controller will communicate unit status (run/off/fault), fan speed, valve position, intake and discharge temperatures and temperature set point to the BMS.

Figure 2: Ventilation strategy



Source: Atelier Ten

3.1.3.3 Cooling systems

Comfort cooling will be available across the permanently occupied areas of the building. Cooling demand will be met through the use of high efficiency, water cooled chillers located within the basement, and linked to the wet cooling towers on the roof top. A plate heat exchanger between the condenser water and chilled water circuits will be provided for free cooling during winter and mid-season, when the external conditions are adequate.

Cooling will be supplied via a ducted underfloor system in the office areas, meeting rooms, lobbies and event spaces and using a VAV system in the amenity, kitchen and staff cafe areas. Trench units shall provide cooling to the perimeter zones of the office floors. A separate dedicated water cooled chiller will be provided to serve the IT spaces, such as intermediate distribution facility (IDF) rooms. Any cooling required for the retail areas will be provided by the tenant.

The whole cooling system will be linked to the BMS system and will have separate accessible energy sub-meters installed to facilitate the monitoring of substantial energy uses and high demand areas within the building.

Each chiller will be provided with open protocol packaged controls. Upon receipt of a demand single, the BMS will enable the lead chiller. The associated lead chilled water and condenser water pumps will be commanded to start. Once flow is proved, the chiller will carry out its own diagnostic checks and start. The chiller controller will modulate the chiller output to maintain a constant CHW flow temperature.

A free cooling plate heat exchanger allows the transfer of coolth between the condenser water system and the chilled water system (CHW) system directly.

Each chiller and pump set will be individually metered

Each cooling tower will be individually metered for both electrical and water consumption.

3.1.3.4 Heating systems

Space heating and domestic hot water (DHW) will be sourced from the local King's Cross District Heating Network. Heating will be available across all the permanently occupied areas of the building. It will be supplied via a ducted underfloor system in the office areas, meeting rooms, lobbies and event spaces and using a VAV system in the amenity, kitchen and cafe areas.

Perimeter spaces adjacent to large glazed facades, will have trench heating units to ensure thermal comfort and avoid draughts during winter. The circulation spaces adjacent to the Sports Hall (MUGA) will be provided with trench units to provide local heating. Heating for the retail areas will be provided by the tenant via electricity provided to each retail space. No connection to the district heating network will be provided for the retail units.

While entrances and exits are lobbied, air curtains will be provided to all entrances and exits within the building as at peak times both lobby doors may effectively be open due to heavy traffic. Air curtains will be provided with Low Temperature Hot Water (LTHW) heating coils, fed from the fan coil LTHW circuit. Air curtains will be vertical bespoke architectural column heaters (located either side of each entrance doorway) or horizontal units mounted above entrance door.

The whole heating system will be linked to the BEMS system and will have separate accessible energy sub-meters installed to facilitate the monitoring of substantial energy uses and high demand areas within the building.

3.1.3.5 Lighting systems and substantial energy uses

Energy efficient lighting will be installed throughout the building. The majority of internal light fittings will be energy efficient light-emitting diode (LED) with advanced demand-led controls.

Daylight dimming sensors will be provided for spaces adjacent to windows to give precedence to natural daylight. Occupancy sensors will be installed in circulation areas, storage spaces, IDF, toilets, changing rooms, Wellness and Fitness Centre, the ancillary Events Centre, office and meeting rooms. All internal and external lighting will be time controllable.

Energy-efficient lifts will be installed to reduce transport-related energy consumption.

All lighting with the development is to be automatically controlled either directly or via lighting control panels. Each luminaire will be individually addressable and dimmable in response to daylight levels. Lighting to external roof top amenity space will be provided by the same system with interface to weather station readings for external daylight compensation and clock adjustment. Plant and service areas will be connected to the BMS for fault reporting but be controlled by local occupancy sensors with on-off control only.

3.1.3.6 Electrical systems

Centralised power factor correction is provided to achieve 0.95 or better.

All fan and pump motors are provided with high efficiency inverterdrives for variable speed control. This enables systems to be turned down at part load.

Photovoltaic panels are also included in the scheme for renewable energy generation.

3.2 Condition 17(B): Reduction in carbon emissions

“The Environmental Sustainability Plan shall explain the reduction in carbon emissions achieved through these building design and technology energy efficiency measures, compared with the emissions permitted under the national Building Regulations prevailing at the time the application(s) for approval of reserved matters are submitted.”

The Zone A Building is primarily an office building, with retail uses on the ground floor. As such, it falls within the remit of Building Regulations Approved Document L2A (AD L2A). The Zone A Building carbon emissions have been calculated using the National Calculation Methodology (NCM) 2013. The Department for Communities and Local Government (DCLG) approved dynamic simulation modelling (DSM) software for EPC and Part L 2013, IES VE 2015.2.2.0, has been used.

The calculation results indicate that the notional building emission levels are 2,129 tCO₂/year (Table 2). By applying the proposed building design and technology energy efficiency measures (i.e. the proposed passive and active measures as described under Section 3.1 above), the building is able to reduce the annual regulated CO₂ emissions by 129.3tCO₂/year (Table 3), which equates to 6.1% carbon savings compared to the emissions permitted under the prevailing Building Regulations (Part L 2013). This complies with the requirements set by Obligations 6 and 7 of Section X of the KXC S106 Agreement, which sets a target for each new building to achieve carbon emissions at least 5% lower than Part L of the prevailing Building Regulations (i.e. 2013 with 2016 amendments) using good passive design and energy efficient measures.

Results indicate that with the incorporation of a photovoltaic array with an output of 19,800 kWh annually on the roof, the building is able to achieve a further reduction of 9.6tCO₂/year, which equates to 0.4% further savings compared to the Part L 2013 baseline.

Therefore, the combined carbon savings achieved through the building design and technology energy efficiency measures described under Section 3.1, herein along with the incorporation of photovoltaic panels on the roof, but disregarding the carbon savings that will be achieved by utilising the low carbon local district energy system, equate to 6.5% compared to the prevailing Building Regulations (Part L 2013) baseline

Table 2: Regulated CO₂ emissions

	Regulated CO ₂ emissions (tonnes CO ₂ /annum)
Baseline: Part L 2013	2,129
After building design and technology energy efficiency measures (passive and active design measures)	2,208

Table 3: Regulated CO₂ emission savings

	Regulated CO ₂ emission savings	
	(tonnes CO ₂ /annum)	%
Savings from building design and technology energy efficiency measures (passive and active design measures)	129.3	6.1
Savings from photovoltaic panels	9.6	0.4
Cumulative savings from building design and technology energy efficiency measures (passive and active design measures) + PVs	138.9	6.5

Business as Usual Benchmark (ECON 19)

Section X of the KXC Section 106 Agreement includes an obligation to carry out the development with the objective of achieving a site-wide 32% reduction in carbon emissions compared to the 'Business as Usual Benchmark', as identified in the Energy Assessment which supported the outline planning application (2005). For office buildings, the relevant benchmark is ECON19, which includes process loads such as catering facilities, data rooms etc. consumed within the building. This contrasts with Part L of the Building Regulations which excludes small power. The impact of small power is dependent on the fit-out of the building and the occupier's own requirements.

Since the completion of the Section 106 Agreement in 2006, Part L of the Building Regulations has been updated to include more stringent requirements in terms of the energy efficiency of a building and is now considered the primary method of assessment for a building's performance. By meeting the requirements of the current Part L (2010), the building will be achieving a reduction in carbon emissions that meets (and indeed exceeds), the ECON19 Business as Usual Benchmark set out in the original KXC Energy Assessment, thus making a contribution to the achievement of the 32% target set out in the Section 106 Agreement.

3.3 Condition 17(C): Provision of green and/or brown roofs

“The Environmental Sustainability Plan shall explain the specification for any green and/or brown roofs.”

Development Zone A has not been identified as a priority zone for green and/or brown roofs⁴ on Parameter Plan KXC 021 of the Outline Planning Permission. Nonetheless, accessible landscaped areas for staff and visitors are proposed at roof level (see Figure 3 below).

The total green roof area will equate to 3,779 m², which will cover approximately 40% of the total roof area, which will consist of lawn and wildflower planting. The inclusion of a green roof in the Zone A Building design is intended to provide a highly vegetated environment with a number of programmed spaces to allow for an intimate contact with nature and the open sky within the dense urban fabric.

The roof landscape design includes four main character areas (Plateau, Fields, Gardens, Headland) defined by the concept of landscape evolution. These are detailed further in Table 4 below. It is to be noted that the potential to enhance biodiversity and attract wildlife has been carefully considered for this design

Accessibility and flexibility of the design has also been considered; a ramp and walkway element will connect the various levels, whilst a tray system is designed to contain the soil volumes and ensure the longevity and adaptability of the roof planting.

Figure 3: Proposed landscaping and amenity areas at roof level



Source: Stage 3 Report, Volume 3, January 2017

⁴ The term 'green roof' is defined in the Revised Development Specification (2005) as both intensive ornamental roof gardens and extensive roofs with more naturalistic plantings or self-established vegetation. The term 'brown roof' refers to roof areas where ruderal vegetation (vegetation associated with disturbed sites) is allowed to colonise low fertility substrates like those found in the rubble of demolished buildings.

Table 4: Roof landscape character areas

Character Areas	Principles	Function	Design
Plateau	<ul style="list-style-type: none"> • Largest open space on the roof at 3570m² • Sits on level 12 	<ul style="list-style-type: none"> • Trim trail with exercise stations at regular intervals • Seating/garden rooms cut-out into the wild landscape • Amphitheatre with 180° views to the Regents Canal, Granary Square and the London skyline 	<ul style="list-style-type: none"> • Simple in terms of planting but will bring much valued biodiversity • Meadows, woodland floor planting and points of rain water collection will attract wildlife such as insects and birds • Bee-hives • Wind buffer tree and tall shrub planting along the western side • Two large lawn circles to accommodate large seasonal events or regular fitness and recreation classes
Fields	<ul style="list-style-type: none"> • Amenity space of 1240m² • Sits on level 11 above the multi-use games area (MUGA) • Connected to the Café with a direct tunnel access 	<ul style="list-style-type: none"> • Seating area for up to 200 people • Movable planters/grow beds • Outdoor barbeque 	<ul style="list-style-type: none"> • Predominantly hard space • Wind buffer tree planting along the western side • Planted beds raised off the ground to accommodate trees and shrubs • Storage and maintenance rooms under mini-slope structures
Garden	<ul style="list-style-type: none"> • Amenity space of 800m² • Sits on level 10 above the pool and Wellness & Fitness Centre • Also accessed through the upper floor of the MUGA 	<ul style="list-style-type: none"> • Predominantly green space • Lawn area capable of holding small crowds and gatherings 	<ul style="list-style-type: none"> • Based on the principles of an English walled garden • High planter boxes on three sides • Large lawn area at its heart bordered by a large planted bed with a rich planting mix • Wind buffer tree planting along the western side • Long seats provided using planter elevations
Headland	<ul style="list-style-type: none"> • Split into 2 levels • Upper side sits on level 8 with direct access to and from the Wellness & Fitness Centre • Lower side sits on level 7 with access from the Flexible Meeting Area 	<ul style="list-style-type: none"> • Predominantly hard space • Views of the London skyline and KXC area • Mid-level deck for exercise, stretching and yoga classes • Timber amphitheatre 	<ul style="list-style-type: none"> • Thin decked area • Wind buffer tree and tall shrub planting along the western side • wide seating steps from level 8 to level 7 with step access on both sides • Step free access to both levels from inside the building

3.4 Condition 17(D): Energy supply

“The Environmental Sustainability Plan shall explain how energy shall be supplied to the building(s), highlighting:

- *how the building(s) relate(s) to the site-wide strategy for district heating incorporating tri-generation from distributed combined heat and power;*
- *how the building(s) relate(s) to the strategy for using biofuel boilers to supplement the energy supplied through district heating systems;*
- *the assessment of the cost-effectiveness and reliability of the supply chain for biofuels; and*
- *any other measures to incorporate renewables.”*

The Energy Centre, which forms part of Building T1 at KXC, has already been constructed and partially commissioned to meet the heat and hot water demand of the first occupiers at KXC. KCCGPL and its partners have also established the Energy Services Company (ESCO) to run the district heating and install the necessary heat and power distribution infrastructure that form the King's Cross District Heating Network. The King's Cross District Heating Network will provide space heating and hot water to the Zone A Building, contributing to the overall savings in carbon emissions against the Part L2A target emission rate (TER). The combined heat and power (CHP) engines within the Energy Centre will also generate electrical power (to be fed into the National Grid), which will offset a significant percentage of the building's demand.

The Energy Centre will include:

- 3No. 1.8MW_{th} gas fired CHP,
- a thermal store integral to the CHP operating hours strategy and
- 3No. 9MW_{th} gas boilers.

It is assumed that the Energy Centre providing district heating operates using 60% of the heating from the CHP and 40% from the gas boilers, and the carbon emission factor should be taken as 0.097 kgCO₂/kWh. A primary energy factor of 0.437 has been estimated for the district heating network.

It is assumed that future provision will be made to accommodate biomass boilers within the King's Cross District Heating Network. In order to be able to assess the impact of biomass in terms of energy and carbon emissions, it would be necessary to know the balance between the CHP, boilers and biomass boilers and calculate the carbon and primary energy factors. The future inclusion of biomass boilers or fuel cells within the energy centre will likely lead to further carbon reductions.

3.4.1 Carbon emission savings from the District Heating Network

Taking into account the carbon savings produced by the incorporation of building design and technology energy efficiency measures as described under Section 3.1 above, in addition to the connection of the building to the district heating network, the design is able to reduce the annual regulated CO₂ emissions by 458.84 t CO₂/year (Table 5), which equates to a total of 21.5% carbon savings compared to the prevailing Building Regulations (Part L 2013) baseline.

Table 5: Regulated CO₂ emission savings

	Regulated CO ₂ emission savings	
	(tonnes CO ₂ /annum)	%
Savings from building design and technology energy efficiency measures (passive and active design measures)	129.3	6.1
Savings from district heating	329.5	15.5
Cumulative savings from building design and technology energy efficiency measures (passive and active design measures) + district heating	458.8	21.5

3.4.2 Carbon emission savings from renewable technologies

A photovoltaic array with an output of 19,800 kWh annually will be installed on the roof to generate zero carbon electricity and meet a small part of the Zone A Building's electricity demand.

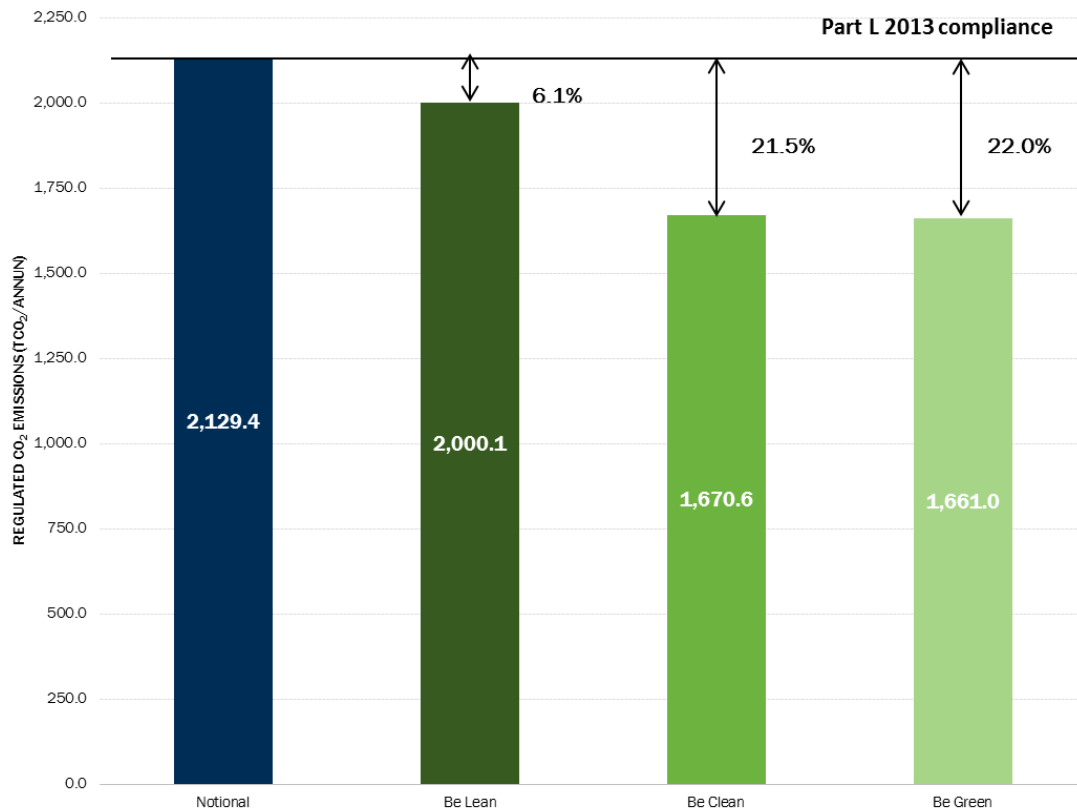
With the incorporation of photovoltaics on the roof, the building is able to reduce the annual regulated CO₂ emissions by 9.6 tCO₂/year, contributing to 0.4% carbon savings compared to the prevailing Building Regulations (Part L 2013) baseline. In total, the proposed design achieves carbon savings of 468.4 tCO₂/year (Table 6), which equates to 22.0% carbon savings compared to the prevailing Building Regulations (Part L 2013) baseline (see Figure 4 below).

Table 6: Regulated CO₂ emission savings

	Regulated CO ₂ emission savings	
	(tonnes CO ₂ /annum)	%
Savings from building design and technology energy efficiency measures (passive and active design measures)	129.3	6.1
Savings from district heating	329.5	15.5
Savings from photovoltaic panels	9.6	0.4
Cumulative savings from building design and technology energy efficiency measures (passive and active design measures) + district heating + PVs	468.4	22.0

Figure 4: Carbon emission reduction

THE ENERGY HIERARCHY [PART L 2013]
 3966 KGX1 - MAY 2017- REV 00



Source: Atelier Ten

3.4.3 Assessment of available renewable technologies

Although there are no planning targets relating specifically to the KXC Development Zone A for the incorporation of renewable technologies in terms of carbon emission reduction or energy production, a number of technologies have been examined for the Zone A Building.

3.4.3.1 Wind

The possibility of installing a wind turbine on the Zone A Building to provide electricity has been taken into consideration.

The main factor affecting the output of wind turbines is the average wind speed. This varies for different areas of the UK but increases with the height of the turbine above ground level. The local topography and the existing and future developments surrounding the Zone A Building can have an impact on the local wind speeds. The wind maps from the Met Office have been used to predict the approximate wind speed in the locality of the Zone A Building. The estimated annual mean wind speed is in the range of 0.5 to 1.5m/s.

Currently, Renewable UK, formerly named British Wind energy Association (BWEA), suggests wind turbines operate with a wind speed of 4m/s, but produce useful amounts of energy if the average wind speed is of at least 5m/s throughout the year. The wind speed in Development

Zone A is quite far below the minimum average wind speed needed to operate a turbine efficiently throughout the year.

Stand-alone wind turbines taller than 10m have not been considered due to the maximum permitted height limits set by Parameter Plan KXC 014 of the Outline Planning Permission. In addition, surrounding buildings would impact the efficiency of any type of wind turbine applicable to Development Zone A.

Due to planning and technical constraints, this technology is not considered to be viable for the Zone A Building.

3.4.3.2 Biomass

The incorporation of a biomass heating system as part of the King's Cross District Heating Network to provide space heating, domestic hot water and additional electricity is being investigated.

3.4.3.3 Solar thermal

It would be possible to install solar thermal collectors on the roof of the Zone A Building, to provide a percentage of the hot water demand. However, as such a system could not be sized to meet total heating demand due to limited available roof area. Further, due to the existence of the local district heating network described at length above, the incorporation of solar collectors is not required. It was therefore deemed more carbon efficient to install photovoltaic panels or landscaped amenity space on the proposed building.

3.4.3.4 Air source heat pumps

Air source heat pumps (ASHPs) are considered a renewable source when they are used for heating in addition to cooling. ASHPs have lower seasonal cooling efficiencies than the proposed water cooled chillers, and, due to the existence of a local district heating network, the installation of ASHPs for the provision of heating is not deemed necessary.

3.4.3.5 Ground source heat pumps

Even though ground source heat pumps (GSHPs) are run on electricity, they are considered renewable because they extract energy for heating and cooling from the ground. However, due to the existence of a local district heating network, the installation of GSHPs is not required, and is not seen as a viable option as the district heating system would cover the site's heat loads, making the thermal balance of the heat flows into and out of the ground difficult to achieve. GSHPs require deep excavations having an impact on the construction process, capital cost and schedule of construction; therefore this system has not been considered for the Zone A Building.

3.4.3.6 Photovoltaic panels

The option of integrating photovoltaic panels on the unshaded roofs of the building to provide electricity has been assessed. Due to the absence of surrounding buildings taller than the proposed Zone A Building, there is a large available non-shaded roof area that can and will be used for solar collection. A photovoltaic array with an output of 19,800 kWh annually is therefore proposed.

3.5 Condition 17(E): BREEAM rating

“The Environmental Sustainability Plan shall explain how the proposed building(s) have been designed to achieve a BREEAM and/or Ecohomes rating of “very good” (or an equivalent assessment method and rating) or better.”

The proposed KXC Zone A development has been registered and will be assessed under both the BREEAM and LEED schemes, the widely recognised environmental assessment methods in the UK and U.S. respectively. Environmental performance targets for the project are set beyond the requirements set by Condition 17(E).

3.5.1 BREEAM overview

BREEAM is a widely recognised environmental assessment method for buildings and communities in the UK. It sets the standard for best practice in sustainable design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria including aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.

The Zone A Building has been registered and will be assessed under the BREEAM New Construction 2014 scheme. As appropriate, the office and ground floor retail uses will be assessed separately, with the latter being assessed as 'Shell only', since the retail units will be fit out only once the Zone A Building is completed.

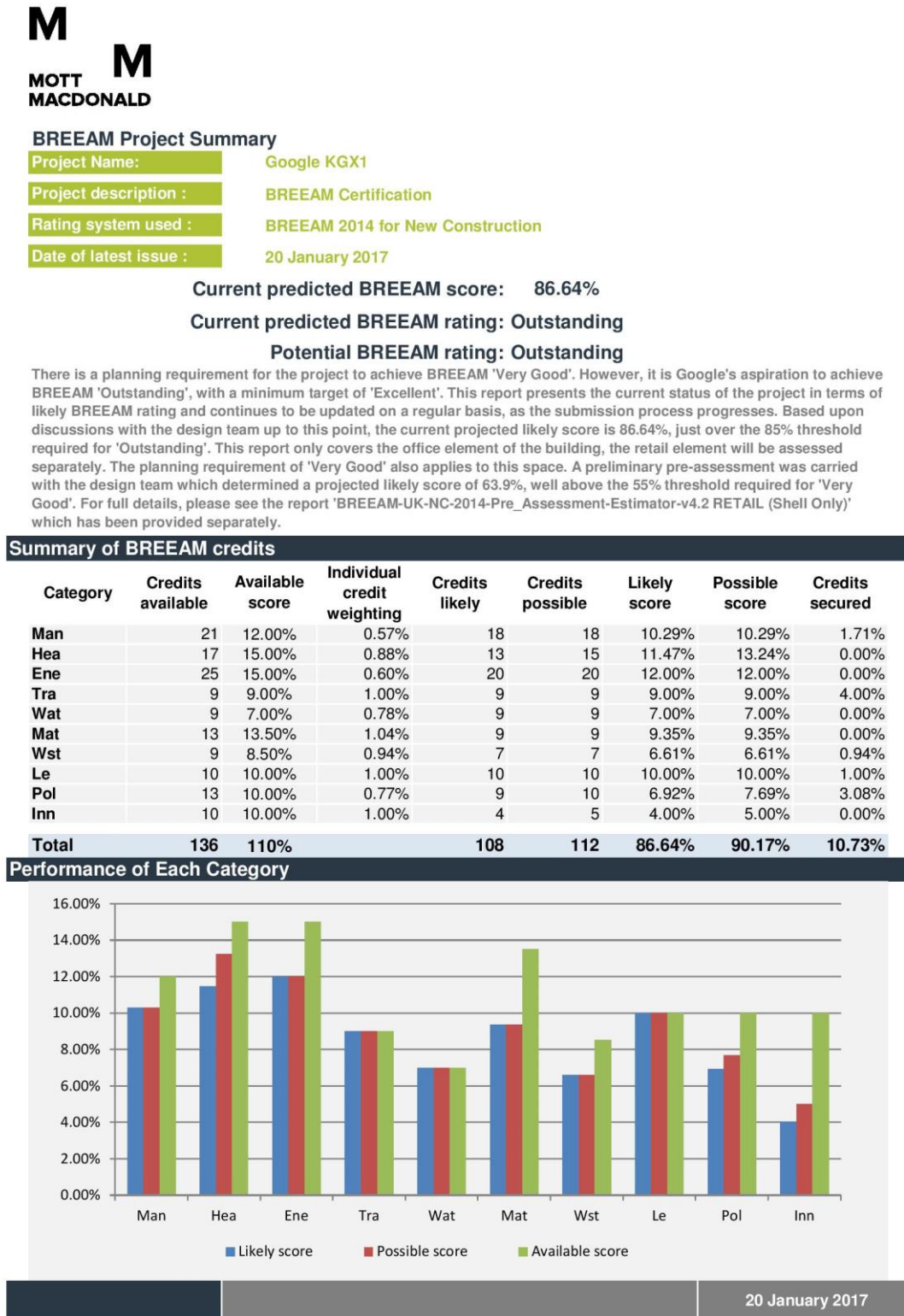
However, the large majority of the building will accommodate office space, to which this BREEAM assessment applies. The project team is committed to going beyond the requirement of this condition and to achieve a minimum rating of 'Excellent', but with an aspiration to reach 'Outstanding', and to reaching 'Very Good' for the retail 'shell only' elements of the building.

The pre-assessment undertaken by the BREEAM assessor for the general office areas of the proposed Zone A Building indicates a current predicted score of 86.64% (i.e. an 'Outstanding' rating), as summarised in Figure 5 overleaf and set out in Appendix B. This goes well beyond both the planning condition and project targets, which require a 'Very Good' and 'Excellent' rating respectively.

The updated pre-assessment undertaken for the 'Shell-only' retail uses of the proposed Zone A Building indicates a current predicted score of 47.36% (i.e. a 'Good' rating), with a potential score of 71.22% (a BREEAM Excellent rating), as summarised in Figure 6 overleaf and set out in Appendix C. This is in line with the relevant planning condition and project targets.

The approach taken for every aspect of the proposed building's design includes passive and active measures maximising the building's sustainability. The expected performance of the KXC Zone A Building against all relevant categories, as also described elsewhere in this plan, demonstrates the inclusion of sustainability best practice features as set out in Figures 5 and 6 overleaf.

Figure 5: KXC Zone A Building: BREEAM Pre-assessment (General office areas)



Source: BREEAM Project Report, Mott Macdonald, 20 January 2017

Figure 6: KXC Zone A Building: BREEAM Pre-assessment 'Shell Only' (Retail)



BREEAM Project Summary

Project Name:	Google KGX1 Retail Façade
Project description :	BREEAM Certification
Rating system used :	BREEAM 2018 for New Construction - Shell Only
Date of latest issue :	28 January 2022

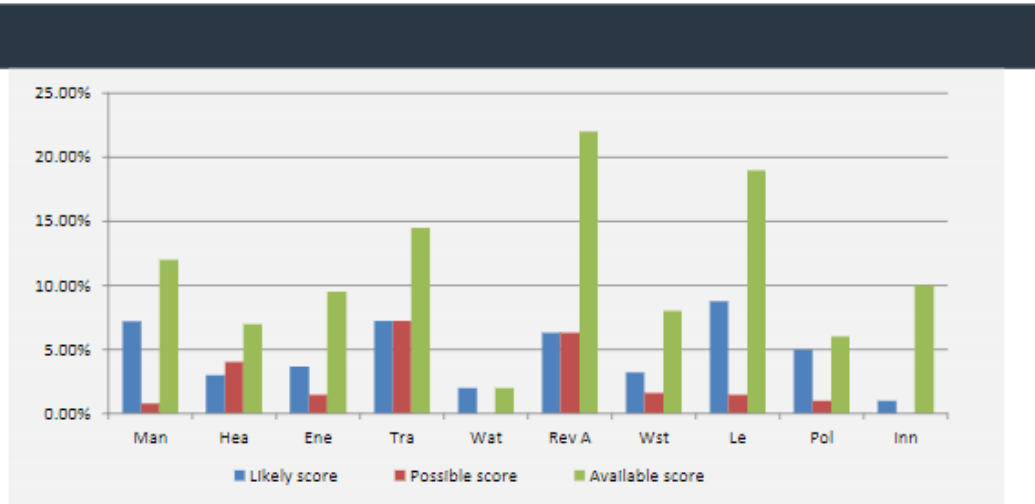
Current predicted BREEAM score: 47.36%
 Current potential BREEAM score: 71.22%

Current predicted BREEAM rating: BREEAM Good
 Current potential BREEAM rating: BREEAM Excellent

This report presents the current status of the project in terms of likely BREEAM rating and is expected to be updated on a regular basis, as the submission process progresses.

Summary of BREEAM credits

Category	Credits available	Available score	Individual credit weighting	Credits likely	Credits possible	Likely score	Possible score	Credits secured
Man	15	12.00%	0.80%	9	1	7.20%	0.80%	0.00%
Hea	7	7.00%	1.00%	3	4	3.00%	4.00%	0.00%
Ene	13	9.50%	0.73%	5	2	3.65%	1.46%	0.00%
Tra	12	14.50%	1.21%	6	6	7.25%	7.25%	0.00%
Wat	2	2.00%	1.00%	2	0	2.00%	0.00%	0.00%
Rev A	14	22.00%	1.57%	4	4	6.29%	6.29%	0.00%
Wst	10	8.00%	0.80%	4	2	3.20%	1.60%	0.00%
Le	13	19.00%	1.46%	6	1	8.77%	1.46%	0.00%
Pol	6	6.00%	1.00%	5	1	5.00%	1.00%	0.00%
Inn	10	10.00%	1.00%	1	0	1.00%	0.00%	0.00%
Total	102	110%		45	21	47.36%	71.22%	0.00%



28 January 2022

Source: Retail BREEAM Pre-assessment Report, Mott Macdonald, 28 January 2022

3.5.2 LEED Overview

LEED is one of the most popular green building certification programs used worldwide and has been developed by the U.S. Green Building Council (USGBC). It is an internationally accepted standard for design, operation and construction of high performance green buildings, ensuring the buildings are environmentally compatible, provide a healthy work environment and are profitable.

Similarly to BREEAM, the LEED rating system is organised into categories addressing issues relating to site sustainability, water efficiency, energy and atmosphere, materials and resources and indoor environmental quality, although it places higher weighting on some of these issues, in particular energy and air quality. An additional category, 'Innovation in Design', addresses sustainable building expertise as well as design measures not covered under the aforementioned categories.

Although LEED is not referred to in Condition 17(E), Google UK Limited has requested that the Zone A Building be assessed against this well-known building rating method, in line with their corporate standards, and with a view to achieving the highest possible rating (i.e. 'Platinum').

The Zone A Building has been registered and is being assessed under the LEED v4 for Building Design and Construction (LEED v4 BD-C) scheme.

The updated pre-assessment undertaken by the appropriate consultant (see Appendix D) indicates a predicted LEED score of 74 points, in relation to the retail element of the project. This is equivalent to a 'Gold' rating, with the aspirational highest rating of 'Platinum' to be achieved on completion, as shown in Figure 7 as follows.

Figure 7: KXC Zone A Building: Retail Façade LEED Pre-assessment

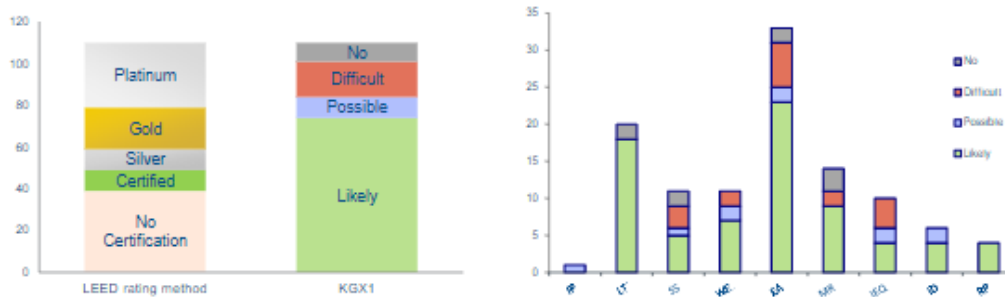


LEED Project Summary

Project title:	Google KGX1 Retail Façade
Project description :	LEED Certification
Rating system used :	LEED v4 BD+C for Core and Shell
Date of latest issue :	28 January 2022

Current predicted LEED score: 74 points
Current predicted LEED rating: GOLD
Potential LEED rating: PLATINUM

It is Google's aspiration for the project to pursue LEED certification. It is the project target to achieved LEEDv4 Gold as a minimum, with the aspirational target of Platinum being set. To realise this aspiration, the project needs to demonstrate compliance with a minimum of 80-points through design and construction measures. This report presents a summary of performance for the KGX1 project against the requirements of the LEED rating system. The likelihood of achieving each credit has been aligned with current project design considerations and construction practices.



Project Team:

	Company	Short	Named individual
Owner:	Google	Client	Michael Mercer Cox
Architect:	Heatherwick	Hwick	Elisa Simonetti
Mech Engineer:	N/A	N/A	N/A
Civil Engineer:	N/A	N/A	N/A
Landscape Architect:	N/A	N/A	N/A
Ecologist	N/A	N/A	N/A
Acoustician	N/A	N/A	N/A
Commissioning Agent:	TBC	CXA	TBC
Project Manager :	Turner & Townsend	T&T	Craig Molachlan
Contractor:	TBC	Cont.	TBC
Energy Modelling:	TBC	EnMod	TBC
LEED Energy Modelling	TBC	EnModL	TBC
LEED AP :	Mott MacDonald	MM	Eszter Gulacsy

Definition of credit likelihood categories:

Likely	Credit is usually easily achieved as a matter of best practice or by virtue of site selection
Possible	No information received yet or technical difficulties are expected
Difficult	Credit can only be achieved at high capital expense or great technical difficulty
No	Credit is not applicable or cannot be achieved by virtue of the project's characteristics

28 January 2022

Source: LEED Project Report, Mott MacDonald, 28 January 2022

3.6 Condition 17(F): Wildlife features

“The Environmental Sustainability Plan shall explain the incorporation of bird boxes, bat roosts and other wildlife features on buildings.”

The landscaped terraces at roof level are designed as amenity and recreation spaces for the use of the building's members of staff and their visitors. It measures 300 metres in length and varies in width from 20 to 60 metres. The roof covers a total area of 9,492 m², with a balance of roughly 60% hard landscape and 40% soft landscape. The design concept is based around four character areas, the Plateau, Field, Garden and Headland.

These measures will significantly enhance the ecological value of the submission site and of KXC generally, providing new habitats that will have strong potential to attract wildlife.

The soft area on the roof is approximately 3,779m² which includes lawn and wildflower planting.

The Plateau has been designed with particular thought on how to enhance biodiversity. The use of meadows, woodland floor planting and rainwater collection points at this level will attract wildlife such as insects and birds. The installation of beehives is also included in the proposals. These will also play an important part of the life on the Plateau, with collection of honey, workshops with the staff working in the building and sharing of honey related products.

In order to create the perfect environment for biodiversity and human use, a wide band of tree and tall shrubs will line the western edge protecting wildlife and people from dominant south-west winds.

Further advice will be sought from a qualified ecologist regarding bird and bat species that are present in the area and potential proposals for suitable type of boxes to be installed on site.

3.7 Condition 45: Drainage

“The new drainage infrastructure within the site shall be designed to achieve a combined (storm and foul) peak discharge to the existing combined sewers of 2292 l/s or less.”

3.7.1 Site wide drainage infrastructure

The figure of 2292 l/s in the wording of Condition 45 describes the maximum peak (storm and foul) discharge which is permissible for the site as a whole to discharge to the existing combined sewers. The peak discharge will be split between the Camden Sewer and York Way Sewer (for Northern Area) and the Camley Sewer / Fleet Sewer (for the Southern Area).

The cumulative peak discharge from the many building plots and areas of infrastructure will exceed 2292 l/s under certain weather conditions. In these instances, the site wide drainage infrastructure, including online and offline attenuation (see below), will attenuate peak flows discharging from individual plots, adopted highway and public realm, enabling cumulative peak flows to be reduced to 2292 l/s or less.

The site wide surface and foul water disposal strategy can be summarised as follows:

- To provide separate surface and foul water networks, combining only at the final manhole prior to connection into the existing Thames Water sewerage network;
- To provide online attenuation (for example oversized pipe work) and offline attenuation (for example proprietary modular underground storage systems / tanks) to buffer peak flows generated within the site down to the agreed discharge rates into the existing Thames Water sewerage network;
- To ensure that no above ground flooding occurs during the worst case 1 in 30-year storm event;
- To ensure that no internal building flooding occurs during the worst case 1 in 100-year (+20%) storm event;
- To accord with PPS 25 and Sewers for Adoption 6th Edition;
- To discharge at various locations into the sewerage network; and
- To design the above infrastructure such that combined surface and foul water flows do not exceed 2292 l/s during a 1 in 30 storm event.

The site wide drainage infrastructure at King’s Cross Central can be described in terms of three drainage infrastructure areas, incorporating both building plots and infrastructure/public realm. These are described under Table 7 below

Table 7: Drainage infrastructure areas

Drainage infrastructure area	Plot developments	Infrastructure / Public realm
Eastern Goods Yard	The Granary Complex, Q1, Q2, R1, R3, R4, R5, R6, R7, R8, 50% of T1, T2, J1, H1, K1, K2, K3, K4 and 50% of I1.	Stable Street, Wharf Road, Handyside Street, Granary Square, Cubitt Park and Handyside Gardens.
Southern Area Infrastructure	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, D1, E1, F1 and V1.	The Boulevard, Goods Way, Station Square and Pancras Square.
Remainder of the Northern Area including the Triangle Site	50% of I1, M1, M2, M3, N1, P1, P2, S1, S2, S3, S4, S5, T3, T4, T5, T6 and W1.	Canal Reach and Cubitt Square.

Source: PBA

Table 8 identifies the assumed peak foul and surface water flows from each of the building plots which underpins the design of the site-wide infrastructure. The foul water figures are based on CIRIA 177 Variable Peaking Factor and the assumed foul water discharges from various land uses identified in Table 9. The surface water peak flows are based on a 1 in 30-year storm. It should be noted that it is most unlikely that the foul and surface water peak discharges from each individual plot will coincide with each other.

Table 8: Peak surface and foul water flows for the Southern Area

Plot reference	Assumed Peak Flows (l/s)	
	Surface water (1 in 30-year event)	Foul water
A1	68.8	6.62
A2	94	6.62
A3	122	6.62
A4	155	6.62
A5	193	6.62
B1	118	23.2
B2	63	5.5
B3	263	11.2
B4	112	10.7
B5	169.2	12.5
B6	130	10.5
D1	40	5.8
E1	48	3.2
F1	45	2.4
V1	59	6.0
Totals	1680	124.1

Source: PBA

Generally, foul water discharges represent small but consistent flows subject to diurnal patterns. For example, residential properties will exhibit two peaks within their diurnal flow pattern, one in the morning and one in the early evening.

Surface water discharges, on the other hand exhibit extreme variations in flow, directly related to rainfall intensity.

The surface water discharge from each plot development will have its own unique hydrograph (identifying the variation between flow and time – the peak of which only lasting for a few minutes in most cases). Each one of these peaks (within the hydrographs) combine within the main drainage infrastructure at different points in time during the storm event creating an averaged flow within the pipe network.

These flows will discharge into the Thames Water network via flow hydraulic controls at the downstream end of each network. These hydraulic controls limit the discharges to a combined maximum of 2292l/s. Where the plot development discharges combine to produce flows in excess of the maximum allowable discharge, water will be held within the drainage infrastructure which has been specifically sized to accommodate these flows.

Table 9: Foul water discharge parameters from various land uses

Land use	Demand options	Discharge to sewer (l/day/hd)	l/s/head	Operational hours	Population density (m ² per person)
Residential	-	152	0.0023457	18	36.2
Student Accommodation	-	152	0.0023457	18	19.5
Retail	Large retail	26.6	0.0009236	8	40
Food/Drink	Customer/day 2hr sittings	28.5	0.0009896	8	1.4
Education	General	19	0.0006597	8	10
Business	Without canteen	41	0.0014236	8	12
Hotel		133	0.0046181	8	20
Leisure	Sports club	142.5	0.0049479	8	40

Source: PBA

3.7.2 Drainage infrastructure relating to Plots A1 to A5

Plots A1 to A5 (Development Zone A) are serviced by the Southern Area drainage systems (Table 7), which discharge via restricted discharges in to the combined Thames Water Camley Sewer/Fleet Sewer. The drainage networks have been designed on SuDS principles providing an overall peak flow reduction of 10% (based on a 1 in 30-year storm).

Thames Water has approved the surface and foul water discharges into the Camley Sewer/Fleet Sewer for the networks serving these plots. The approved discharges reflect the assumptions described in Tables 8 and 9 (above). The assumed surface water and foul water peak flows for plots A1 to A5 (Zone A) are set out in Table 8 above. The peak water discharge flows for the Zone A development are 632l/s and 33.1l/s, for surface water, and foul water respectively.

It should be noted that the figures in Table 8 do not specifically include public realm areas. However, the Southern Area public realm was included in the hydraulic model used during the design of the infrastructure to ensure that each of the drainage sub catchments (buildings and public realm) are attenuated and the flows into the combined Thames Sewer are restricted so that the permissible discharges set out in the Outline Planning Permission are not exceeded.

4 Response to S106 Obligations

4.1 S106 – Section AA: Water

Section AA of the S106 Agreement places obligations for the Developer to use reasonable endeavours to:

- *“incorporate within the detailed design of the Development water efficiency measures such that those designs secure at least forty per cent (40%) of the potable water consumption credits available under the BREEAM/EcoHomes methodologies which represents a reduction of approximately twenty to thirty per cent (20-30%) against typical water consumption”;*
- *“incorporate within each phase of the Development one or more of the following alternative water supplies to meet five per cent (5%) or more of the non-potable needs of such phase:*
 - a. groundwater abstraction;*
 - b. greywater and blackwater recycling;*
 - c. rainwater harvesting”;* and
- *“ensure that the design for the treatment of storm water runoff within the Development incorporates, where practicable, filtration, attenuation and other techniques that are consistent with the then best practice advice on SUDs, to control the timing and volume of flows.”*

4.1.1 Water Efficiency

The BREEAM criteria for water consumption have been used as a benchmark for the project, to reduce the consumption of potable water for sanitary use in the proposed building.

The Zone A Building will achieve high standards of water efficiency with water-efficient fixtures, such as dual flush WCs, water efficient taps and showers. The following water-efficient fixtures will be specified for the building:

- WC: dual flush 4/3.5 l/flush;
- Lavatory faucet: 1.89 l/min;
- Shower: 4.73 l/min.

Provision for the installation of a greywater system is also included in the design proposals. This will be used as a means of off-setting non-potable water demand from water consuming components that would otherwise be supplied using potable water. It is proposed that the greywater will be used to serve the WC flushing.

At this stage, it is estimated that the proposed measures will reduce water consumption by 60% against typical water consumption and result in all of the 5 credits being achieved under the relevant BREEAM category. The design team has further allowed for the aspiration to achieve the relevant innovation credit available, by demonstrating exemplary performance under the water consumption category once completed, which would represent a 65% improvement against baseline building water consumption being achieved.

4.1.2 Alternative Water Supplies

As already stated in 4.1.1 above, the inclusion of a greywater recycling system is included in the proposals so as to off-set non-potable water demand and therefore reduce potable water

consumption. It is proposed that greywater is collected from washing hand basins and showers to be reused for toilet flushing.

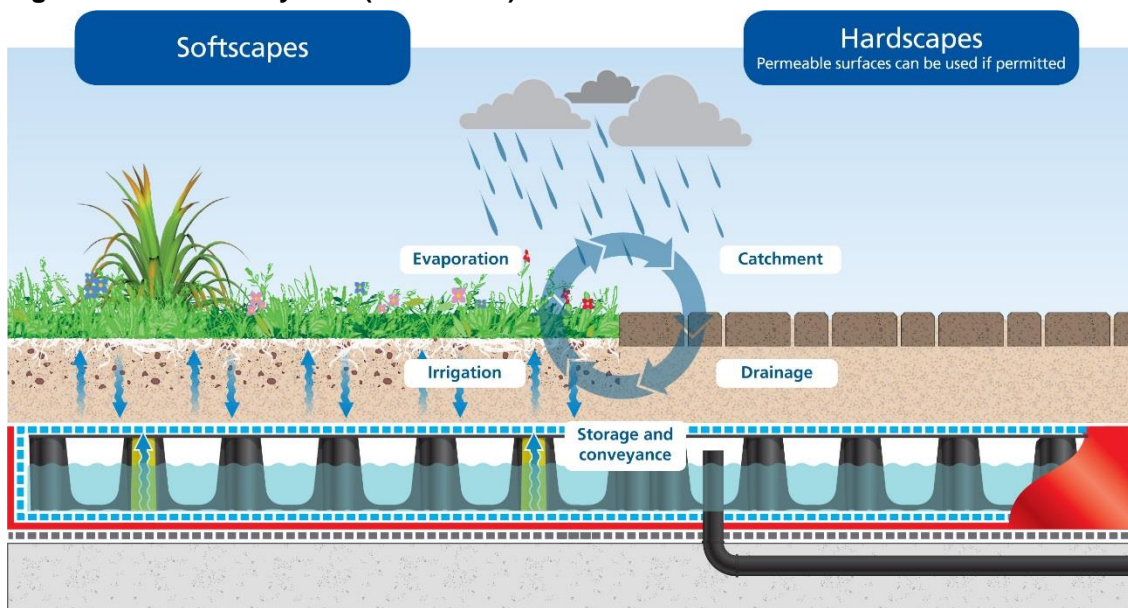
In addition to that, a blue roof system (see Figure 8 below) is proposed for the Zone A Building. Rainwater will be collected on the roof and reused for irrigation at the point of collection. The use of efficient irrigation system in combination with the selection of native/adapted vegetation is expected to reduce potable water use for external landscaping by 50%.

4.1.3 Sustainable Urban Drainage (SuDS)

A blue roof system has been included as part of the proposed design to manage runoffs from rainfalls. The development is aiming to attenuate a minimum of 79 m³, which necessitates a drainage layer at roof level covering at area of at least 1632m². This will achieve the level of attenuation expected for LEED and BREEAM purposes.

The blue roof system will help mitigate flood risk on-site and reduce potable water use for irrigation without having to specify stormwater harvesting tank, which will take up space in the basement and incur pump energy for pumping up the collected rainwater in the basement for re-use on the roof landscaped area. The blue roof system is proposed in the 'Plateau' area at the roof level.

Figure 8: Blue Roof System (Permavoid)



Source: <http://www.middleeast.polypipe.com/specialist-solutions/water-management-solutions/capillary-irrigation-system>

4.2 S106 – Section Y: Construction materials and waste

Section Y of the S106 Agreement places obligations for the Developer to:

- *“implement the Construction Materials and Purchasing Strategy”;*
- *“apply the Construction Materials and Purchasing Strategy in agreeing specifications and targets in contracts with contractors, designers and suppliers of services in relation to construction of buildings within the Development”;*
- *“use reasonable endeavours to minimise packaging waste associated with the delivery of construction materials for the buildings within the Development”;*
- *“use reasonable endeavours to produce topsoil and subsoil within the Development using subsoil and crushed rubble from the Site combined with organic composts, green composts and organic waste streams for use in areas of landscaping in order to avoid where practicable importing soils”;* and
- *“use reasonable endeavours to achieve the Construction Targets during the construction of the Development.”*

4.2.1 Construction Materials and Purchasing Strategy

The materials selection strategy will use relevant BREEAM criteria as a benchmark. It is intended that materials with ratings of A or A+, as defined in the BRE's Green Guide to Specification, will be specified for the following building elements to the extent possible:

- External walls;
- Windows;
- Roof;
- Upper floor slab;
- Internal Walls;
- Floor finishes / coverings.
- Insulation; and,
- Hard landscaping and boundary protection.

Where available, materials which have obtained an Environmental Product Declaration (EPD) will be included in the specification for the project. Whilst also contributing to an uplift in BREEAM score, specifying products with EPDs also demonstrates the project's commitment to communicate the life-cycle environmental impact of construction materials with transparency.

Products will also be procured in line with the BREEAM responsible sourcing criteria, which require that any products specified meet the following:

- Procured from suppliers with an ISO 14001 certified Environmental Management System for key process;
- Procured from suppliers with an ISO 14001 certified Environmental Management System for key process and supply chain extraction process;
- Certified under BES 6001; and,
- For metals, certified under the CARES SCS scheme or Eco-reinforcement scheme.

All timber and timber based products used on the project will be Legally harvested and traded timber, and will have achieved FSC or PEFC Chain of Custody certification.

4.2.2 Materials Health and Transparency

The development will be implementing Google's 'Healthy Materials Program' to assess the potential health impact of construction materials on occupants' health and wellbeing. The main focus of this initiative is to obtain full disclosure of ingredients contained in the materials specified and installed as part of the proposed development. This increased transparency will be highly beneficial to the development's occupants, as well as the wider construction industry.

4.2.3 Packaging Waste

It is intended that packaging waste relating to transportation and delivery of construction materials on site will be kept to a minimum and wherever possible re-used or recycled.

Packaging waste will be included in the waste targets, as highlighted in Section 2.9 above. Under BREEAM, the project is targeting two credits for construction resource efficiency, by achieving a benchmark of 6.5 tonnes or less of waste generated per 100m² (gross internal floor area).

A target for the diversion of waste from landfill has also been set to 95% diversion, going well beyond BREEAM requirements of 80% (by tonnes) of non-hazardous construction waste diverted from landfill.

4.2.4 Soil

Section to be completed as landscaping strategy progresses.

4.3 S106 – Section Z: Waste

Section Z of the S106 Agreement places obligations for the Developer to:

- *“provide occupiers of the Development with Waste Information Packs and use reasonable endeavours to obtain feedback regarding the success or popularity of the initiatives contained within such Packs”;*
- *“use reasonable endeavours to incorporate within the detailed design of commercial and leisure buildings within the Development best practice design solutions that provide for waste segregation and storage areas and will use reasonable endeavours to maintain such solutions as are implemented”;* and
- *“provide and maintain segregated waste containers within the Public Realm Areas at suitable locations and in appropriate numbers.”*

4.3.1 Waste Information Packs

In order to minimise operational waste generated by the building's use and to ensure that any waste strategy put in place will be followed by the building's users, Waste Information Packs will be distributed to occupiers.

4.3.2 Design Solutions

Operational waste will be considered, in line with the requirements of BREEAM UK New Construction 2014. Specifically, the Zone A Building will include dedicated spaces for the storage and segregation of various recyclable waste streams. In addition, these spaces will be sized appropriately for the building size and projected volumes of operational waste.

Appendices

A.	Part L Analysis	37
B.	BREEAM Pre-assessment (Offices)	41
C.	BREEAM Pre-assessment (Retail)	42
D.	LEED Pre-assessment (Offices)	43
E.	LEED Pre-assessment (Retail)	44
F.	Environmental Sustainability Plan Addendum	45

A. Part L Analysis

A.1 Overview

The carbon emissions are calculated using National Calculation Methodology (NCM) and Government approved carbon emissions modelling software tools i.e. IES VE version 2015.2.2.0.

The carbon emission estimations presented herein are the result of calculations based on reasonable assumptions about the performance of the building elements and services. These assumptions as well as the achievements in terms of energy consumption and CO₂ emissions are subject to changes and further refinement as the design develops.

A.1.1 Part L requirements

The Approved Document Part L2A is intended to give guidance on how to satisfy Part L (Conservation of fuel and power in new buildings other than dwellings) of the Building Regulations for new non-domestic buildings.

Compliance with Part L 2013 (with 2016 amendments) is demonstrated herein by meeting Criterion 1, 2 and 3 at this early stage:

Criterion 1. Achieving target emissions rate (TER)

The calculated CO₂ emission rate for the building (BER) for the building must not be greater than the target emission rate (TER), i.e. $BER \leq TER$.

Criterion 2. Limits on design flexibility

The performance of the building fabric and services should be no worse than the limits set out in Part L 2013. Atelier Ten has negotiated the relaxation of Criterion 2 for the solid wooden panels that form part of the main façade. It has been agreed that these solid elements are part of the frame system and need to be compared against the limiting U-value of a window, rather than an external wall.

A reasonable limit for the design air permeability of $3.0\text{m}^3/(\text{h}\cdot\text{m}^2)$ at 50Pa has been adopted at this design stage. Achievement of this target will need to be demonstrated by undertaking air-pressurisation test at post-construction stage.

Design limits for building services must be applied as set out in the 2013 edition of the "Non-domestic Building Services Compliance Guide".

Criterion 3. Limiting the effects of heat gains in summer

For every space in the building where this criterion applies, the solar gain through the glazing aggregated over the period from April to September inclusive must not be greater than the limiting solar gain calculated based on the benchmark glazing types as described by the NCM modelling guide 2013.

The solar gain limit is calculated and checked on a zone by zone basis in the actual/proposed building. Any zone in the actual/proposed building that is either mechanically cooled or has an

activity that is flagged in the NCM activity database as “occupied” space must be assessed against this criterion.

For the purposes of demonstrating compliance with Criterion 3, circulation spaces and other areas of transient occupancy, such as toilets, as well as spaces that are not intended for occupation are excluded.

Due to particularities of Criterion 3, the triple height warehouse spaces could only be compared against a single height space, therefore, making compliance strenuous. Atelier Ten worked with the Building Control officer to create a compliance approach that would meet the intent of the regulations as interpreted by Part L 2013, even though it diverges from the specific wording.

Two alternative interpretations and calculation methodologies were agreed:

- Adopt the reference for Criterion 3 to be agnostic as to internal configuration, allowing a reference strip of glazing per floor of accommodation;
- Adopt “whole building calculations” as opposed to space by space calculations for Criterion 3 compliance.

To reflect this “whole building” approach and to allow for flexibility in façade design to reflect local conditions within the building, it is further proposed that compliance is assessed across the whole building rather than against individual spaces such that:

- $\sum(\text{solar flux of spaces}) \leq \sum(\text{solar flux limit under Criterion 3 of each space})$

A.2 Building model and operational parameters

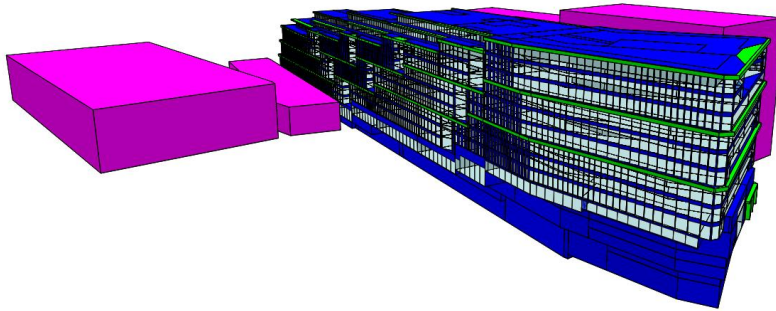
The model is divided into a number of zones in line with corresponding activity areas. Each activity type corresponds to a number of default parameters in line with the National Calculation Methodology (NCM) database and guidance, which the tool uses to calculate the energy consumption. These parameters include occupancy profile, temperature set points, heat gains from people, lighting and equipment, and fresh air requirement.

A number of reasonable assumptions were made. These will need to be refined as the design progresses. They may have an impact on the CO₂ emission reduction but the compliance with all the requirements of Part L 2013 for new non-domestic buildings will not be compromised.

The performance of the external envelope (e.g. U-values, g-values), including external walls, roof, ground floor, external doors, external windows, is better than the minimum standards set out in Part L 2013 for new non-domestic buildings. The heating, cooling, ventilation, domestic hot water (DHW) and lighting systems are modelled in line with the MEP outline specification by Atelier Ten.

Solar loads vary daily and depend on seasonal and weather conditions, and will affect loads which are accounted for in the thermal modelling process, such as solar transmission, conduction and building heat transfer. These are presented in the model by virtue of the weather data file, in this case the CIBSE London Test Reference Year (TRY) data.

Figure 9: 3D thermal model (IES VE 2015)



Source: Atelier Ten

A.3 Carbon emission reduction calculation

Criterion 1. Achieving target emissions rate (TER)

The Target Emissions Rate (TER) must be lower than the Building Emissions Rate (BER).

The carbon emissions of the notional building (TER) were calculated to be 22.23 kgCO₂/year.
The carbon emissions of the actual design (BER) were calculated to be 17.34 kgCO₂/year.

The results from the dynamic model calculations indicate a 22.0% total reduction in CO₂ emissions from the building.

The building complies with Criterion 1.

Criterion 2. Limits on design flexibility

Criterion 2 limits to design flexibility ensure that a minimum level of performance is achieved for the envelope, DHW, heating, ventilation and air conditioning (HVAC) systems and lighting for all buildings and designs.

All envelope properties, fittings, HVAC systems and lighting have been specified to comply with the Part L2A Building Regulations requirements. The proposed and the limiting U-values set out in the Part L Building Regulations (Table 10) have been used to determine the Building Emission Rate (BER) and the Notional Building Target Emission Rate (TER) respectively. Final values may differ slightly from those set out here as a result of final detailing and procurement, but overall target values are expected to be generally maintained.

The Zone A Building therefore complies with Criterion 2.

Table 10: Limiting Part L 2013 and proposed envelope parameters

Building Envelope	Part L2A limiting U-values	Proposed U-values	Window g-values	Window light transmittance
External wall	0.35 W/(m ² .K)	0.25 W/(m ² .K)		
Basement wall	0.25 W/(m ² .K)	0.25 W/(m ² .K) ⁵		
Roof	0.25 W/(m ² .K)	0.25 W/(m ² .K)		
Ground floor	0.25 W/(m ² .K)	0.25 W/(m ² .K)		
Basement floor	0.25 W/(m ² .K)	0.25 W/(m ² .K) ⁶		
Opaque curtain wall elements	2.20 W/(m ² .K)	1.20 W/(m ² .K) ⁷		
Window office	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.24	0.45
Window amenity	2.20 W/(m ² .K)	1.60 W/(m ² .K)	0.28	0.55
Window ground floor (East)	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.18	0.40
Window ground floor (North/West/South)	2.20 W/(m ² .K)	1.20 W/(m ² .K)	0.38	0.70
Window retail	2.20 W/(m ² .K)	1.60 W/(m ² .K)	0.38	0.70

Source: Atelier Ten

Note: These are general fabric performances and are subject to minor modification during the final design and procurement process

Criterion 3. Limiting the effects of heat gains in summer

The limiting heat gains standards are achieved via provision of low g-value glazing.

The results indicated in Table 11, show that the whole building complies with Criterion 3 following the agreed alternative calculation methodology, as explained previously ($\sum(\text{solar flux of spaces}) \leq \sum(\text{solar flux limit under Criterion 3 of each space})$).

Table 11: Criterion 3

	Solar gain actual (kWh)	Solar gain notional (kWh)
Total solar gains	876,966	2184670
% improvement (actual/notional)	59%	

Source: Atelier Ten

⁵

⁶

⁷ The opaque elements of the façade are considered part of the framing system frame and are thus compared against the limiting U-value for a curtain wall.

B. BREEAM Pre-assessment (Offices)



Google KGX1

BREEAM Project Report

BREEAM Project Summary

Project Name:	Google KGX1
Project description :	BREEAM Certification
Rating system used :	BREEAM 2014 for New Construction
Date of latest issue :	20 January 2017

Current predicted BREEAM score: 86.64%

Current predicted BREEAM rating: Outstanding

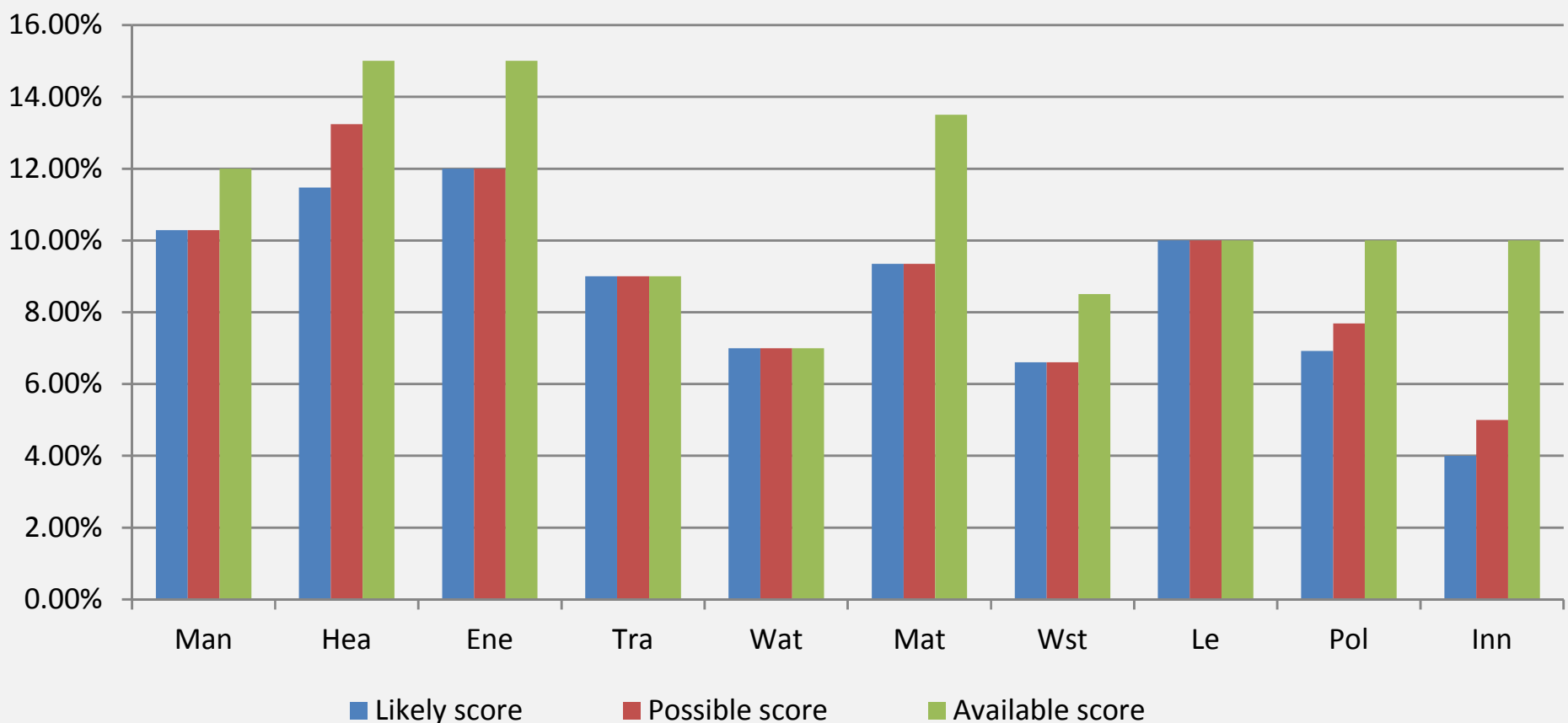
Potential BREEAM rating: Outstanding

There is a planning requirement for the project to achieve BREEAM 'Very Good'. However, it is Google's aspiration to achieve BREEAM 'Outstanding', with a minimum target of 'Excellent'. This report presents the current status of the project in terms of likely BREEAM rating and continues to be updated on a regular basis, as the submission process progresses. Based upon discussions with the design team up to this point, the current projected likely score is 86.64%, just over the 85% threshold required for 'Outstanding'. This report only covers the office element of the building, the retail element will be assessed separately. The planning requirement of 'Very Good' also applies to this space. A preliminary pre-assessment was carried with the design team which determined a projected likely score of 63.9%, well above the 55% threshold required for 'Very Good'. For full details, please see the report 'BREEAM-UK-NC-2014-Pre_Assessment-Estimator-v4.2 RETAIL (Shell Only)' which has been provided separately.

Summary of BREEAM credits

Category	Credits available	Available score	Individual credit weighting	Credits likely	Credits possible	Likely score	Possible score	Credits secured
Man	21	12.00%	0.57%	18	18	10.29%	10.29%	1.71%
Hea	17	15.00%	0.88%	13	15	11.47%	13.24%	0.00%
Ene	25	15.00%	0.60%	20	20	12.00%	12.00%	0.00%
Tra	9	9.00%	1.00%	9	9	9.00%	9.00%	4.00%
Wat	9	7.00%	0.78%	9	9	7.00%	7.00%	0.00%
Mat	13	13.50%	1.04%	9	9	9.35%	9.35%	0.00%
Wst	9	8.50%	0.94%	7	7	6.61%	6.61%	0.94%
Le	10	10.00%	1.00%	10	10	10.00%	10.00%	1.00%
Pol	13	10.00%	0.77%	9	10	6.92%	7.69%	3.08%
Inn	10	10.00%	1.00%	4	5	4.00%	5.00%	0.00%
Total	136	110%		108	112	86.64%	90.17%	10.73%

Performance of Each Category



BREEAM Project Scorecard

Current Predicted Rating: **Outstanding**

Potential Rating: **Outstanding**

(Likely + Possible credits)

20 January 2017

Pass: 30% to 44%, Good: 45% to 54%, Very Good: 55% to 69%, Excellent: 70% to 84%, Outstanding: >85%

Credit	Available	Current Credits		Possible	%	Credit title	Primary Responsibility	Action by	Status / Comments
		Likely	Possible						
Management									
Man 01	4	1	0.57%	0	0.00%	Project Brief and Design	Argent		No Evidence Provided
Man 02	4	4	2.29%	0	0.00%	Life Cycle Cost and Service Life Planning	G&T / Principal Contractor		In Progress
Man 03	6	6	3.43%	0	0.00%	Responsible Construction Practices	Principal Contractor		No Evidence Provided
Man 04	4	4	2.29%	0	0.00%	Commissioning and Handover	Principal Contractor		No Evidence Provided
Man 05	3	3	1.71%	0	0.00%	Aftercare	Principal Contractor/Google		No Evidence Provided
TOTAL Category		18	10.29%						
Health and Wellbeing									
Hea 01	4	2	1.76%	1	0.88%	Visual Comfort	BDP / A10		In Progress
Hea 02	5	4	3.53%	0	0.00%	Indoor Air Quality	BDP		In Progress
Hea 04	3	3	2.65%	0	0.00%	Thermal Comfort	A10		In Progress
Hea 05	3	3	2.65%	0	0.00%	Acoustic Performance	Sandy Brown		No Evidence Provided
Hea 06	2	1	0.88%	1	0.88%	Safety and Security	BDP / Argent / Cornerstone / Google		In Progress
TOTAL Category		13	11.47%						
Energy									
Ene 01	12	8	4.80%	0	0.00%	Reduction of Energy Use and CO ₂ Emissions	Team		In Progress
Ene 02	2	2	1.20%	0	0.00%	Energy Monitoring	A10		No Evidence Provided
Ene 03	1	1	0.60%	0	0.00%	External Lighting	BDP		No Evidence Provided
Ene 04	3	2	1.20%	0	0.00%	Low Carbon Design	A10		In Progress
Ene 05	2	2	1.20%	0	0.00%	Energy Efficient Cold Storage	SHW		No Evidence Provided
Ene 06	3	3	1.80%	0	0.00%	Energy Efficient Transportation Systems	Sweco		No Evidence Provided
Ene 08	2	2	1.20%	0	0.00%	Energy Efficient Equipment	Google / SWH		No Evidence Provided
TOTAL Category		20	12.00%						
Transport									
Tra 01	3	3	3.00%	0	0.00%	Public Transport Accessibility	MM		Closed Out
Tra 02	1	1	1.00%	0	0.00%	Proximity to Amenities	Argent		Closed Out
Tra 03	2	2	2.00%	0	0.00%	Cyclist Facilities	BDP		In Progress
Tra 04	2	2	2.00%	0	0.00%	Maximum Parking Capacity	BDP		No Evidence Provided
Tra 05	1	1	1.00%	0	0.00%	Travel Plan	Argent / Transport Consultant		In Progress
TOTAL Category		9	9.00%						
Water									
Wat 01	5	5	3.89%	0	0.00%	Water Consumption	A10 / BDP		In Progress
Wat 02	1	1	0.78%	0	0.00%	Water Monitoring	A10		No Evidence Provided
Wat 03	2	2	1.56%	0	0.00%	Water Leak Detection	A10		No Evidence Provided
Wat 04	1	1	0.78%	0	0.00%	Water Efficient Equipment	Gillespies		No Evidence Provided
TOTAL Category		9	7.00%						
Materials									
Mat 01	5	3	3.12%	0	0.00%	Life Cycle Impacts	BDP		In Progress
Mat 02	1	1	1.04%	0	0.00%	Hard Landscaping and Boundary Protection	BDP		In Progress
Mat 03	4	2	2.08%	0	0.00%	Responsible Sourcing of Materials	Principal Contractor		In Progress
Mat 04	1	1	1.04%	0	0.00%	Insulation	BDP / A10		In Progress
Mat 05	1	1	1.04%	0	0.00%	Designing for Robustness	BDP		No Evidence Provided
Mat 06	1	1	1.04%	0	0.00%	Material Efficiency	BDP / BIG		In Progress
TOTAL Category		9	9.35%						
Waste									
Wst 01	4	3	2.83%	0	0.00%	Construction Waste Management	Principal Contractor		No Evidence Provided
Wst 02	1	0	0.00%	0	0.00%	Recycled Aggregates	-		No Evidence Provided
Wst 03	1	1	0.94%	0	0.00%	Operational Waste	BDP		No Evidence Provided
Wst 04	1	1	0.94%	0	0.00%	Speculative Floor and Ceiling Finishes	BDP / BIG / Google		No Evidence Provided
Wst 05	1	1	0.94%	0	0.00%	Adaptation to Climate Change	AKT II		Closed Out
Wst 06	1	1	0.94%	0	0.00%	Functional Adaptability	BDP		In Progress
TOTAL Category		7	6.61%						
Land Use and Ecology									
LE01	2	2	2.00%	0	0.00%	Site Selection	Argent		In Progress
LE02	2	2	2.00%	0	0.00%	Ecological Value of Site	Argent / Ecologist / Principal Contractor		No Evidence Provided
LE03	2	2	2.00%	0	0.00%	Minimising Impact on Site Ecology	Argent / Ecologist		No Evidence Provided
LE04	2	2	2.00%	0	0.00%	Enhancing Site Ecology	Argent / Ecologist		No Evidence Provided
LE05	2	2	2.00%	0	0.00%	Long Term Impact on Biodiversity	Argent / Ecologist / Principal Contractor		No Evidence Provided
TOTAL Category		10	10.00%						
Pollution									
Pol 01	3	2	1.54%	1	0.77%	Impact of Refrigerants	A10		No Evidence Provided
Pol 02	3	0	0.00%	0	0.00%	NOx Emissions	-		No Evidence Provided
Pol 03	5	5	3.85%	0	0.00%	Surface Water Run Off	Gillespies		In Progress
Pol 04	1	1	0.77%	0	0.00%	Reduction of Night Time Light Pollution	BDP		No Evidence Provided
Pol 05	1	1	0.77%	0	0.00%	Reduction of Noise Pollution	Sandy Brown		No Evidence Provided
TOTAL Category		9	6.92%						
Innovation									
Innovation		4	4.00%	1	1.00%				No Evidence Provided

Summary of BREEAM requirements: Management

Management

Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
MAN 01	Project Brief and Design	Argent	<p>One Credit - Stakeholder Consultation (Project Delivery) (Likely) Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.</p> <p>One Credit - Stakeholder Consultation (Third Party) (Not Targeted) Prior to completion of the Concept Design stage, all relevant third party stakeholders have been consulted by the design team and this covers the minimum consultation content. The project must demonstrate how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the Initial Project Brief and Concept Design. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), consultation feedback has been given to, and received by, all relevant parties.</p> <p>One Credit - Sustainability Champion (Design) (Not Targeted) A Sustainability Champion has been appointed to facilitate the setting and achievement of BREEAM performance target(s) for the project. The design stage Sustainability Champion is appointed to perform this role during the feasibility stage (Stage 1, Preparation and Brief stage, as defined by the RIBA Plan of Work 2013 or equivalent).</p> <p>One Credit - Sustainability Champion (Monitoring Progress) (Not Targeted) A Sustainability Champion is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process and formally report progress to the client and design team.</p>	<p>One Credit - Stakeholder Consultation (Project Delivery) Consultation plan setting out the process and scope of the consultation. Minutes from early stage meetings, demonstrating early stage contribution of project team.</p> <p>One Credit - Stakeholder Consultation (Third Party) A list of the stakeholders consulted. A consultation plan setting out the process and the scope of the consultation. Agenda/minutes from consultation meetings. Documentation demonstrating consultation feedback and subsequent actions.</p> <p>One Credit - Sustainability Champion Design The Sustainability Champion appointment letter, as well as documentation confirming that the defined BREEAM performance target(s) has been formally agreed between the client and design/project team no later than the Concept Design Stage (RIBA Stage 2 or equivalent). This could be demonstrated by: 1. Meeting Minutes 2. Recorded Correspondence 3. BREEAM AP Reports 4. Relevant sections/clauses in the building specification</p> <p>One Credit - Sustainability Champion (Monitoring Progress) The Sustainability Champion appointment letter as well as documentation confirming the Sustainability Champion will monitor progress against the agreed BREEAM performance target(s) throughout the design progress to the client and design team. This could take the form of the evidence described above.</p>	1	0.57%	0	0.00%	<p>The early stage stakeholder consultation for project delivery has already taken place, to close out the credit records of this consultation prior to the completion of Stage 2 will be required. Argent to provide the Project Execution Plan which should have recorded this consultation and sets out the roles and responsibilities on the project.</p> <p>Due to the confidential nature of the development, it is not thought that appropriate third party consultation has taken place.</p> <p>A BREEAM AP was not appointed prior to the end of Stage 1 as required by the Sustainability Champion credits.</p>
MAN 02	Life Cycle Cost and Service Life Planning	G&T / Principal Contractor	<p>Two Credits - Elemental Life Cycle Cost (LCC) (Likely) An elemental life cycle cost (LCC) analysis has been carried out, at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.</p> <p>One Credit - Component Level LCC Plan (Likely) A component level LCC plan has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 and includes the following component types (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection.</p> <p>One Credit - Capital Cost Reporting (Likely) Report the capital cost for the building in pounds per square metre (£k/m²), via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section.</p>	<p>Two Credits - Elemental Life Cycle Cost (LCC) Elemental life cycle cost plan</p> <p>One Credit - Component Level LCC Plan Component level life cycle cost plan</p> <p>One Credit - Capital Cost Reporting BREEAM Assessment Scoring and Reporting tool reporting the capital cost for the building in pounds per square metre (£k/m²).</p>	4	2.29%	0	0.00%	<p>An Elemental Life Cycle Cost analysis was commissioned and carried out prior to the end of Stage 2. G&T have provided the report and it is compliant with the criteria.</p> <p>There should be no issue with producing a Component Level LCC Plan prior to the end of Stage 4. It is still to be decided whether this will be carried out by G&T or the Contractor once appointed. Either option is suitable.</p> <p>The project's predicted Capital Cost/m² has been provided.</p>

Summary of BREEAM requirements: Health and Wellbeing

Health and Wellbeing

Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
HEA 01	Visual comfort	Atelier Ten	<p>One Credit - Glare Control (Likely) The potential for disabling glare has been designed out of all relevant building areas using a glare control strategy, either through building form and layout and/or building design measures.</p> <p>One Credit (Plus One Exemplary) - Daylighting (Unlikely) The relevant building areas meet the following good practice daylight factor(s): 1. Average Daylight Factor of 2% for at least 80% of the floor area. 2. A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the relevant average daylight factor. 3. At least 80% of the room has a view of sky from desk or table top height and the room depth criterion $d/w + d/HW < 2/(1-RB)$ is satisfied.</p> <p>One credit - View out (Possible) 95% of the floor area in relevant building areas is within 7m of a wall which has a window or permanent opening that provides an adequate view out. The window/opening must be $\geq 20\%$ of the surrounding wall area (refer to Relevant definitions in the Additional information section). Where the room depth is greater than 7m, compliance is only possible where the percentage of window/opening is the same as, or greater than, the values in table 1.0 of BS 82061. In addition, the building type criteria in Table - 13 are applicable to view out criteria.</p> <p>One Credit - Internal and External Lighting Levels, Zoning and Control (Likely) Ensure internal lighting meets the relevant criteria specified by BREEAM and will be appropriately zoned. All external lighting located within the construction zone is designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. To demonstrate this, external lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas3 and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.</p>	<p>Glare Control Relevant section/clauses of the building specification or contract. Window Schedule Details of glare control method.</p> <p>Daylighting Design drawings. Daylight calculations.</p> <p>Views Out Design drawings and calculations</p> <p>Internal and External Lighting Design drawings and/or room data sheets/schedules Relevant section/clauses of the building specification or contract OR a letter of formal confirmation of compliance from the relevant design team member.</p>	2	1.76%	1	0.88%	<p>Blinds may not be used in the building, but there are other design measures that can be used to show compliance with the Glare Control credit. BREEAM gives examples of building integrated measures (e.g. low eaves), bioclimatic design and external shading.</p> <p>At this stage, it is thought that the daylighting credit will be difficult to achieve due to the location and orientation of the building. However, calculations will be carried out as the design develops to determine if there is any chance of compliance.</p> <p>With regards to the views out, analysis by BDP has found that the majority of areas in the building meet the requirements. MM have received confirmation from the BRE that the kitchen spaces can be excluded from the calculations. Plans and calculations to be provided once the layouts of the workstations have been finalised.</p> <p>The internal and external lighting requirements are likely to be integrated into the building design. It is important that all relevant standards are met and the lighting is zoned appropriately with compliant occupant controls.</p>
HEA 02	Indoor air quality	Principal Contractor Atelier Ten	<p>One Credit - Indoor Air Quality (IAQ) Plan (Likely) Produce an Indoor Air Quality Plan which considers the following; - Removal of contaminant sources; - Dilution and control of contaminant sources; - Procedures for pre-occupancy flush out; - 3rd part testing and analysis.</p> <p>One credit- Ventilation (Likely) - Provide fresh air into the building in accordance with the relevant standard - The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution; OR - The location of the building's air intakes and exhausts, in relation to each other and external sources of pollution, is designed in accordance with BS EN 13779:2007 Annex A.2 - In naturally ventilated buildings/spaces: openable windows/ventilators are over 10m from sources of external pollution.</p> <p>Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO2) or air quality sensors specified. In mechanically ventilated buildings/spaces: sensor(s) are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space.</p>	<p>One Credit - Indoor Air Quality (IAQ) Plan Copy of the Indoor Air Quality Plan is required.</p> <p>One credit- Ventilation Relevant section/clauses of the building specification or contract, design drawings detailing the location of the building air intakes and external sources of pollution.</p>	4	3.53%	0	0.00%	<p>An Indoor Air Quality Plan is required, this should be included the Contractor tender documentation.</p> <p>The ventilation credit is thought to be likely at this stage, as the building's air intakes and exhausts are an appropriate distance apart and intakes are over 20 metres from sources of external air pollution. There will be some air intakes facing a street, but this is pedestrianised so this should not affect compliance.</p>

		BDP Principal Contractor	<p>One credit - Volatile organic compound (VOC) emission levels (products) (Likely) All decorative paints and varnishes to meet the relevant European Standard. Other product types, listed by BREEAM, must meet the testing requirements and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards.</p> <p>One credit - Volatile organic compound (VOC) emission levels (post construction) (Likely) Formaldehyde and Total VOC concentration levels to be measured post construction (but pre-occupancy). If levels are to exceed to requirements of BREEAM, commitment from the project team is needed to reduce these levels.</p> <p>One credit - Adaptability - Potential for natural ventilation (Not Targeted) The building ventilation strategy is designed to be flexible and adaptable to potential building occupant needs and climatic scenarios. The natural ventilation strategy is capable of providing at least two levels of user-control on the supply of fresh air to the occupied space.</p>	<p>One credit - Volatile organic compound (VOC) emission levels (products) Confirmation from the Architect is required that all decorative paints and varnishes have met the requirements list in Table -18, and at least 5 of the 8 remaining product categories meet the requirements for the VOC standards outlined.</p> <p>One credit - Volatile organic compound (VOC) emission levels (post construction) Commitment to carry out the necessary testing post construction, and undertake measures to reduce levels if required.</p> <p>Adaptability - Potential for natural ventilation Relevant section/clauses of the building specification or contract Formal letter from the design team with details of the ventilation strategy and calculations/results from appropriate software modelling tool(s) Manufacturers'/suppliers' literature</p>					<p>The relevant testing and emission level standards are now met by most products, so the VOC products credit will very likely be met. BDP to include the requirements within the specifications.</p> <p>Testing is required at the post construction / pre-occupancy stage and was noted as being a Droid Avenger requirement. This therefore means that it will most likely be mandatory to undertake.</p> <p>MM sent a query to BRE to determine if phased testing is acceptable. The BRE responded that it would be possible to phase the testing over different floors depending on when they are to be occupied, however for any credits to be awarded all spaces that are covered by the assessment would need to be compliant. On this basis, the credit can be included in the likely score.</p> <p>The building will not be adopting a natural ventilation strategy.</p>
HEA 04	Thermal Comfort	Atelier Ten	<p>One credit - Thermal model (Likely) Thermal modelling to be carried out using software in accordance with CIBSE AM11 Building Energy and Environmental Modelling. The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. >The thermal modelling demonstrates that the relevant requirements are achieved for a projected climate change environment. Dynamic thermal simulation software packages currently provide the facility for building designs to be assessed under external climatic conditions specific to geographic location.</p> <p>One credit - Adaptability - for a projected climate change scenario (Likely) The thermal modelling demonstrates that the relevant requirements are achieved for a projected climate change environment.</p> <p>One credit - Thermal zoning and controls (Likely) The thermal modelling analysis (undertaken for compliance with criteria 1 to 4) has informed the temperature control strategy for the building and its users.</p>	<p>A copy of the results from the modelling demonstrating the internal temperatures are in compliance with the relevant standards including a projected climate change environment.</p> <p>Formal written confirmation from the design team confirming the name of the modelling software and that it has been selected and applied in accordance with AM11.</p> <p>Design specification and drawings with a narrative explaining the controls strategy.</p>	3	2.65%	0	0.00%	<p>Thermal modelling of the building will be carried out, Atelier Ten believe it should be feasible to include a projected climate change scenario in the modelling to achieve the second credit.</p> <p>Once the modelling is complete a thermal control strategy detailing the thermal zones and controls will be produced.</p>
HEA 05	Acoustic performance	Sandy Brown	<p>Up to Three Credits (Likely) The building meets the appropriate acoustic performance standards and testing requirements defined in the checklists and tables section which defines criteria for the acoustic principles of: a. Sound insulation b. Indoor ambient noise level c. Reverberation times.</p>	<p>Professional report/study and calculations from the acoustician. Letter of appointment / confirmation demonstrating when the acoustician was appointed. Relevant section / clauses of the building specification or contract and / or formal letter from the project team regarding commitments and confirmation that the relevant performance standards.</p>	3	2.65%	0	0.00%	<p>The credit requirements have been sent to Sandy Brown and they will develop the required evidence accordingly.</p>
HEA 06	Safety and security	BDP Argent, Cornerstone Google	<p>One credit - Safe access (Likely) - Dedicated cycle paths and footpaths provide direct access from the site entrance(s) to the building entrance(s) or cycle storage - Dedicated pedestrian crossings are provided where pedestrian routes cross vehicle access routes - The lighting for access roads, pedestrian routes and cycle lanes is compliant with Hea01.</p> <p>One Credit - Security of Site and Building (Possible) A suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). A suitably qualified security specialist (SQSS) develops a set of recommendations or solutions during or prior to Concept Design (RIBA Stage 2 or equivalent). These recommendations or solutions aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the preceding SNA.</p>	<p>Safe access Site plans</p> <p>Security of Site and Building A copy of the SNA from the SQSS confirming the scope of their advice /involvement, the stage of design at which their advice was sought and a summary of their recommendations. A marked up copy of the site/design plans highlighting examples of conformity with SQSS recommendations; OR a copy of the specification clause confirming that the development will conform with SQSS recommendations.</p>	1	0.88%	1	0.88%	<p>MM and BDP have discussed the requirements for the Safe Access credit and believe that an argument can be made that construction of a dedicated cycle lane on site would be impractical, due to the short distance between the site boundary and the entrance to the bicycle ramp. MM have sent to a query to the BRE to determine if this approach would be acceptable. They responded that since access to the building occurs through a pavement that is shared with the public domain, we would not expect provision of cycle lanes, as this would be impractical. Therefore this credit can be included in the likely score. BDP Ground Team to collate the required information.</p> <p>MM confirm that recommendations made by Cornerstone must be incorporated in the design to meet the Security credit. If not, justification must be given as to why these cannot be included - economic reasons are not acceptable.</p> <p>Additional recommendations have been provided by Cornerstone. BDP/BIG to demonstrate that these will be implemented in to the project's design.</p>
Total Section Score:					13	11.47%	2	1.76%	

Summary of BREEAM requirements: Energy

Energy									
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
ENE 01	Reduction of Energy Use and CO2 emissions	Team	<p>Up to Twelve Credits - Energy performance (8 credits Likely) Calculate the Energy Performance Ratio for New Construction (EPR_{Nc}).</p> <p>To achieve 'Very Good', a EPR_{Nc} of at least 0.075 would be required To achieve 'Excellent', a EPR_{Nc} of at least 0.375 would be required. To achieve 'Outstanding', a EPR_{Nc} of at least 0.60 would be required.</p>	<p>A copy of the Building Regulations Output Document from the approved software. The output documents must be based on the design stage of analysis.</p> <p>A copy of the Building Regulations Output</p>	8	4.80%	0	0.00%	<p>There have been a number of recent updates regarding this issue and A10 have provided revised calculations and options for consideration. S106 requirements are more stringent than BREEAM, meaning that achieving 8 points (a minimum requirement for Outstanding) will be mandatory in order to meet the planning obligations. If the lighting efficacy can be increased then no PVs would be required to reach this.</p> <p>A10's calculations show that it will be very difficult to achieve any further credits at this stage.</p>
ENE 02	Energy monitoring	Atelier Ten	<p>One Credit - Sub-metering of major energy consuming systems (Likely) Major energy consuming systems (where present) should be monitored using either a Building Energy Management System (BEMS) or separate accessible energy sub-meters with a pulsed output to enable future connection. The end energy use is identifiable to the building user through labelling or data outputs.</p> <p>One Credit - Sub-metering of high energy load and tenancy areas (Likely) An accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management system are provided, covering a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit.</p>	Specification document or technical drawing confirming energy-consuming systems and their rated outputs; metering arrangements for each system, type and location of meter specified.	2	1.20%	0	0.00%	Both credits under this issue should be achieved, as these criteria also form part of the Google Project Requirements.
ENE 03	External lighting	BDP	<p>The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt. All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic. (Likely)</p>	<p>- Marked up site plan and building elevations showing the location and purpose of all external light fittings.</p> <p>- Lighting specification or lighting designer's calculations confirming the lamp lumens/circuit watt for each type of fitting as well as the colour rendering index (where appropriate)</p> <p>- The external lighting control strategy</p>	1	0.60%	0	0.00%	<p>If appropriate light fittings are specified, the required lighting levels should not be strenuous to meet.</p> <p>All external lighting should be automatically controlled and have presence detection in areas of intermittent pedestrian traffic.</p>
ENE 04	Low Carbon Design	Atelier Ten	<p>One Credit - Passive Design (Likely) The project team carries out an analysis of the existing fabric, form, site location and outline scheme design to influence decisions made during Concept Design stage (RIBA Stage 2 or equivalent). Demonstrate a meaningful reduction in the total energy demand through the use of passive design solutions.</p> <p>One Credit - Free Cooling (Not Targeted) The passive design analysis carried out includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions. The building uses ANY of the free cooling strategies listed by BREEAM to reduce the cooling energy demand, i.e. it does not use active cooling.</p> <p>One Credit - Low Zero Carbon Feasibility Study (Likely) A feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist (see Relevant definitions) to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the building/development. A local LZC technology/technologies has/have been specified for the building/development in line with the recommendations of this feasibility study and this method of supply results in a meaningful reduction in regulated carbon dioxide (CO2) emissions.</p>	<p>One Credit - Passive Design Results from the passive design analysis including the analysis of free cooling and identified opportunities for the implementation of passive design solutions.</p> <p>The team demonstrate a meaningful reduction in the total energy demand through the use of passive design solutions.</p> <p>One credit - Free Cooling Copy of the specification/design documentation showing the use of free cooling in the development.</p> <p>One Credit - Low Zero Carbon Feasibility Study A copy of the feasibility study report</p> <p>Marked up design plans or specifications confirming the proposed installation of LZC technology and manufacturers technical data (details or calculations) stating the carbon savings as a result.</p>	2	1.20%	0	0.00%	<p>Atelier Ten have carried out a passive design analysis, this was included as part of the Stage 2 report.</p> <p>There will be displacement ventilation in the building, but it will not be provided to every occupied space. Therefore the free cooling credit cannot be achieved.</p> <p>Atelier Ten included the LZC feasibility study as part of the Stage 2 report.</p> <p>In order to close out the credits, confirmation is required of how much the passive design measures will reduce energy demand and what area of PVs will be installed. Discussions on these aspects of the design are still ongoing, so this information can be provided once they have been finalised.</p>
ENE 05	Energy efficient cold storage	SeftonHornWinch	<p>One Credit - Refrigeration energy consumption (Likely) 1.The refrigeration system, its controls and components have been designed, installed and commissioned in accordance with the relevant standards (see BREEAM manual). 2.The refrigeration plant has been commissioned to comply with the criteria for commissioning outlined in BREEAM issue Man 04 Commissioning and handover.</p> <p>One Credit - Indirect greenhouse gas emissions (Likely) The installed refrigeration system demonstrates a saving in indirect greenhouse gas emissions (CO2 eq.) over the course of its operational life.</p>	<p>One credit - Refrigeration energy consumption A copy of the specification showing that all refrigeration systems and controls have been designed in accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector1 (see Other information) and BS EN 378-2 and using robust and tested refrigeration systems/components, normally defined as those included on the Enhanced Capital Allowance (ECA) Energy Technology Product List (ETPL) or an equivalent list.</p>	2	1.20%	0	0.00%	MM have discussed the credit requirements with SeftonHornWinch. The manufacturer they propose to use for the Cold Store rooms will be able to demonstrate compliance with criteria.

ENE 06	Energy efficient transportation systems	Sweco	<p>One Credit - Energy Consumption (Likely) An analysis of the transportation demand and usage patterns for the building to be carried out by the design team to determine the optimum number and size of lifts (including counter-balancing ratio). The energy consumption has been calculated in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2 : Energy calculation and classification for lifts</p> <p>Two Credits - Energy Efficient Features (Likely) The three energy-saving features that offer potential energy savings should be specified. Where the use of regenerative drives is demonstrated to save energy, they are specified</p>	<p>One Credit - Energy Consumption A copy of the relevant report or documentation detailing the analysis undertaken and findings/recommendations.</p> <p>Two Credits - Energy Efficient Features A copy of the lift specification and the energy saving features that were specified for the lifts.</p>	3	1.80%	0	0.00%	<p>MM have discussed the credit requirements with Sweco. They will be able to produce the required evidence.</p> <p>The vertical transportation design is currently being updated in line with Google requirements.</p>
ENE 08	Energy Efficient Equipment	Google, SeftonHorn Winch	<p>Two credits (Likely) Identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical/standard specification. Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy demand of the development and its operation.</p>	<p>A copy of the specification confirming the make and model of all white goods to be provided. Manufacturer's literature confirming the EU Energy Efficiency Labelling Scheme energy rating for all white goods to be provided.</p>	2	1.20%	0	0.00%	<p>Credit looks at procurement of office equipment which will primarily form part of the Google fit-out requirement. Relates to all equipment, including VC equipment. It has been identified that if P.G. 2.4 is followed, the criteria can be met as long as it can be demonstrated that all equipment meet Energy Star standards.</p> <p>A10 have undertaken preliminary TM54 calculations and note that kitchen equipment is the largest contributor of unregulated energy (compared to the swimming pool). MM reviewed the Stage 2 report and confirm this is correct. It should be checked that these calculations are still applicable now the design has progressed.</p> <p>MM have discussed in further detail with SHW who will approach manufactures that can provide equipment to meet the requirements.</p>
Total Section Score:					20	12.00%	0	0.00%	

Summary of BREEAM requirements: Transport

Transport									
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
TRA 01	Public transport accessibility	MM	<p>Up to Three Credits - Accessibility Index (3 credits likely)</p> <p>The Accessibility Index is determined by entering the following information in to the BREEAM Tra 01 calculator:</p> <p>a. The distance (m) from the main building entrance to each compliant public transport node</p> <p>b. The public transport type(s) serving the compliant node e.g. bus or rail</p> <p>c. The average number of services stopping per hour at each compliant node during the operating hours of the building for a typical day.</p>	As the site is in Greater London, MM can use Transport for London's Planning Information Database to calculate the Transport Accessibility Index for the project.	3	3.00%	0	0.00%	Transport for London's Planning Information Database calculates that the project has achieved all 3 credits.
TRA 02	Proximity to amenities	Argent	<p>One Credit (Likely)</p> <p>Confirmation that the building is located within 500m of the following amenities;</p> <ul style="list-style-type: none"> - Outdoor space - Post office - Pharmacy - GP / Medical centre - Childcare facility or school - Grocery shop / food store; - leisure/fitness/sports centre. - Cash Machine; 	A marked up scaled map highlighting the location of the assessed building, the location and type of amenities, the safe pedestrian route to the amenities.	1	1.00%	0	0.00%	A map of the wider to site highlighting the pedestrian routes to local services has been provided.
TRA 03	Cyclist Facilities	BDP	<p>One Credit - Cycle Storage (Likely)</p> <p>The maximum occupancy of the building must be determined, to allow the calculation of the number of cycle spaces required to meet compliance.</p> <p>One Credit - Cyclist Facilities (Likely)</p> <p>Cyclist facilities, including showers and changing rooms, to be present onsite. The number of these required will be determined depending upon the occupancy.</p>	<p>A site plan and design details confirming the number, type, dimensions and layout of spaces and location of cycle storage.</p> <p>Relevant specification clauses detailing the lighting in accordance with relevant British Standard</p> <p>Details of building occupancy or net let table floor area.</p> <p>Design drawings or specifications detailing the number of showers; the changing room provision; secure locker locations, dimensions and numbers; and the provision of drying space.</p>	2	2.00%	0	0.00%	<p>Both credits have been targeted as likely, BDP have provided the below numbers during the original pre-assessment:</p> <p>408 spaces 40 showers 400 lockers</p> <p>Confirmation is required that these numbers are still correct.</p> <p>Drawings showing the locations of the cycle spaces and facilities will be required to close out the credits. BDP Ground Team to issue evidence.</p>
TRA 04	Maximum Parking Capacity	BDP	<p>Up to Two Credits - Car parking capacity (Likely)</p> <p>The building's car parking capacity is below the maximum allowance calculated based on BREEAM requirements.</p>	A site plan or copy of the specification confirming: Number and type of parking spaces provided for the building and relevant documentation or correspondence from the design team or client confirming the number of building users.	2	2.00%	0	0.00%	There will be no car parking on site, aside from some disabled spaces, therefore both credits will be achieved. BDP Basement Team to issue plans.
TRA 05	Travel plan	Transport Consultant, Argent	<p>One Credit - Travel plan (Likely)</p> <p>A travel plan has been developed as part of the feasibility and design stages.</p> <p>A site specific travel assessment/statement has been undertaken to ensure the travel plan is structured to meet the needs of the particular site.</p> <p>The travel plan includes a package of measures to encourage the use of sustainable modes of transport and movement of people and goods during the buildings operation and use.</p> <p>If the occupier is known, they must be involved in the development of the travel plan and they must confirm that the travel plan will be implemented post construction and be supported by the buildings management in operation.</p>	<p>A copy of the site specific transport survey/assessment.</p> <p>A copy of the travel plan.</p> <p>A marked up copy of the site plan demonstrating examples of recommendation of the plan that have been implemented.</p> <p>Letter of commitment to implement the Travel Plan upon occupation of the proposed development, including a named member of staff who will act as Coordinator of the Travel Plan.</p>	1	1.00%	0	0.00%	The King's Cross Estate ATP complies with the BREEAM criteria. To close out the credit, the client must confirm that they will implement the Travel Plan post construction.
Total Section Score:					9	9.00%	0	0.00%	

Summary of BREEAM requirements: Water

Water									
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
WAT 01	Water consumption	Atelier Ten	<p>Up to Five Credits - Water Consumption (5 credits Likely) (Exemplary Performance possible) Please specify the performance of the building's domestic water-consuming components so the data can be inputted into the Wat 01 Calculator.</p>	<p>A copy of relevant sections of the sanitary ware specification and/or manufacturer's details confirming the type and amount of fittings and controls installed. Effective flow volumes and the number of fittings required to fill in the calculator.</p> <p>Copy of the Wat 01 Calculator</p>	5	3.89%	0	0.00%	<p>The client has made the decision that vacuum drainage will not be used in the building.</p> <p>MM have carried out calculations to determine current performance. As it stands, greywater and 4.5/3 litre dual flush WCs could be utilised to achieve 5 credits and exemplary performance.</p> <p>A10 will now be updating their water balance calculations to set out the different options.</p>
WAT 02	Water monitoring	Atelier Ten	<p>One Credit - Water Monitoring (Likely) 1. The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source. 2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area. 3. Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. 4. If the construction zone is within a site that has an existing BMS, the pulsed/digital water meter(s) for the construction zone must be connected to the existing BMS</p>	<p>A copy of the specification clause confirming the specification and type of water meter(s) and the connection to the BMS.</p>	1	0.78%	0	0.00%	<p>A mains water meter and sub-meters are planned for the building. It should be ensured that water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are fitted with easily accessible sub-meters.</p>
WAT 03	Water leak detection and prevention	Atelier Ten	<p>One Credit - Leak Detection System (Likely) A permanent, automated leak detection to be fitted on the mains water supply. The system must be able to alert building occupants of a leak, identify different flow and therefore leakage rates, be programmable to suit the owner/occupiers' water consumption criteria, designed to avoid false alarms caused by normal operation of large water-consuming plant.</p> <p>One Credit - Flow Control Devices (Likely) Flow control devices on each WC area/facility to be included in the design.</p>	<p>A copy of relevant specification clauses confirming the scope and performance of leak detection systems; Design drawings; Manufacturer's details confirming the technical specification of the specified systems.</p>	2	1.56%	0	0.00%	<p>The requirements for a leak detection system can be included in the metering strategy for the building. Flow control devices to the WC areas will be included in the design.</p>
WAT 04	Water efficient equipment	Gillespies	<p>One Credit (Likely) Confirmation required as to whether there is an irrigation system to be included within the project scope. If a system is to be included, evidence is required to demonstrate / confirm that the system is BREEAM compliant.</p>	<p>Documentation detailing the planting and irrigation strategy; Relevant section / clauses of the building specification or contract; AND/OR Design drawings; Manufacturers product details.</p>	1	0.78%	0	0.00%	<p>MM have received confirmation from the BRE that internal irrigation does fall under the scope of this issue, however it is thought that the system specified will meet the BREEAM criteria.</p> <p>Gillespies are aware of the criteria and will keep them in mind when specifying the irrigation system.</p>
Total Section Score:					9	7.00%	0	0.00%	

Summary of BREEAM requirements: Materials

Materials									
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
MAT 01	Life cycle impacts	BDP	<p>Up to Six Credits - Green Guide Rating (3 credits likely)</p> <p>Details of the materials to be specified for the following element types to be provided;</p> <ul style="list-style-type: none"> - External walls; - Windows; - Roof; - Upper floor slab; - Internal Walls; - Floor finishes / coverings. <p>The green guide rating of each material must be provided. Architect to specify materials with a GGR of A or A+ where feasible. Green Guide ratings for the specification(s) of each element can be found at www.thegreenguide.org.uk</p> <p>Assessor to input details of materials in Mat01 calculator to determine number of credits which can be awarded.</p>	<p>Specifications confirming a detailed description of each applicable element and its constituent materials;</p> <p>Green Guide rating and element number for each specification assessed;</p> <p>Design drawings or specification detailing location and area (m²) of each applicable element.</p> <p>A copy of the output from the BREEAM Mat 01 Calculator tool.</p>	3	3.12%	0	0.00%	<p>3 credits is an indicative target for now as this is common level of performance for office buildings.</p> <p>Products with EPDs do help to uplift the score under this issue, and so it is something to keep in mind while specifying materials as it also goes towards LEED compliance. No further credits are to be deemed likely at this stage but consideration should be given as the design progresses.</p> <p>BDP to include the requirements within the specifications.</p>
MAT 02	Hard landscaping and boundary protection	BDP	<p>One credit - Green Guide Rating (Likely)</p> <p>Where at least 80% of all external hard landscaping and 80% of all boundary protection (by area) in the construction zone achieves an A or A+ rating, as defined in the Green Guide to Specification.</p> <p>Green Guide ratings for the specification(s) of each element can be found at www.thegreenguide.org.uk</p>	<p>Specifications confirming a detailed description of each applicable element and its constituent materials;</p> <p>Green Guide rating and element number for each specification assessed;</p> <p>Design drawings or specification detailing location and area (m²) of each applicable element.</p>	1	1.04%	0	0.00%	<p>There will be no boundary protection on site, so only the hard landscaping will be applicable to this credit. It must be ensured that these materials are either A or A+.</p> <p>BDP to include the requirements within the specifications.</p>
MAT 03	Responsible Sourcing of Materials	Principal Contractor Principal Contractor Team, Principal Contractor	<p>Pre-Requisite (Likely)</p> <p>All timber used on the project to be sourced in accordance with the UK Government's Timber Procurement Policy.</p> <p>One Credit - Sustainable procurement plan (Likely)</p> <p>The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan.</p> <p>Up to 3 credits - Responsible Sourcing of Materials (1 credit likely)</p> <p>Credits available where specified materials comprising the main building elements are responsibly sourced in accordance with at least one BREEAM approved responsible sourcing scheme.</p>	<p>Pre-requisite</p> <ul style="list-style-type: none"> - A letter of intent confirming that timber shall be sourced from suppliers capable of providing certification to the level required for the particular tier. <p>Sustainable procurement plan</p> <ul style="list-style-type: none"> - Copy of the sustainable procurement plan. <p>Responsible sourcing of materials</p> <ul style="list-style-type: none"> - Design plan or specification confirming the location of elements and materials specified and details of the materials specified. - Documentary evidence detailing how the calculator tool has been completed e.g. specifications, certificates. - Completed copy of the Mat 03 Calculator tool. 	2	2.08%	0	0.00%	<p>These requirements should be included in the Contractor tender documents. One credit under the responsible sourcing of materials is an indicative target for now.</p> <p>It has been identified by G&T that achieving these two extra credits may limit the variety of materials that can be specified by the design team. G&T have identified that an extra £2.5 million would be required to secure these credits.</p> <p>BDP to include the requirements within the specifications.</p>
MAT 04	Insulation	BDP, A10	<p>One Credit - Embodied impact (Likely)</p> <p>All new insulation specified for use within the following building elements must be assessed;</p> <ol style="list-style-type: none"> 1. External Walls; 2. Ground Floor; 3. Roof; 4. Building Services. <p>The Insulation Index for the building fabric and services insulation is the same as or greater than 2.5.</p> <p>The Green Guide rating of each material must be provided, along with the area and thickness of material used.</p>	<p>Marked up design plans/elevations and relevant specification clauses detailing the location of insulating materials and the area and thickness (or volume) specified.</p> <p>Manufacturer's technical details confirming the thickness and thermal conductivity of the insulating materials specified.</p>	1	1.04%	0	0.00%	<p>This credit should be achieved - careful consideration should be given to choosing products with high green guide ratings if possible.</p>
MAT 05	Designing for robustness	BDP	<p>One Credit (Likely)</p> <p>Identification of areas, both internally and externally, where vehicular, trolley and pedestrian movement occur.</p> <p>Suitable durability and protection measures to be specified to prevent damage to vulnerable parts of the building.</p> <p>The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors.</p>	<p>Marked up design drawings illustrating vulnerable areas/parts of the building and the durability measures specified to protect those areas.</p> <p>Evidence of discussions and design measures implemented to prevent degradation of materials from environmental factors.</p>	1	1.04%	0	0.00%	<p>BDP to provide evidence on how vulnerable parts of the building will be protected. MM will provide examples of what sort of information is required.</p> <p>Arup to provide documentation detailing how exposed parts of the building will be protected from material degradation due to environmental factors.</p>
MAT 06	Material Efficiency	BDP, BIG	<p>One Credit (Likely)</p> <p>Opportunities have been identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life.</p> <p>The above is carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages:</p> <ol style="list-style-type: none"> a. Preparation and Brief b. Concept Design c. Developed Design d. Technical Design e. Construction 	<p>Written confirmation that opportunities will be identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life at the relevant RIBA stages.</p>	1	1.04%	0	0.00%	<p>MM have discussed the requirements further with BDP and BIG. It should be ensured that discussions and decisions on optimising the use of materials in building design, procurement, construction, maintenance and end of life, have been recorded at each Stage.</p>
Total Section Score:					9	9.35%	0	0.00%	

Summary of BREEAM requirements: Waste

Waste

Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
WST 01	Construction waste management	Principal Contractor	<p>Up to three credits - Construction Resource efficiency (2 credits Likely) (1 credit not targeted) Produce a Resource Management Plan (RMP), reduce and record construction waste. Principal Contractor to specify waste generation and diversion targets in line with the team's BREEAM expectations.</p> <p>One credit - Diversion of resources from landfill (Likely) Divert demolition and construction waste from landfill to meet the team's BREEAM targets.</p> <p>Exemplary Level Criteria (Unlikely) The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: Non-hazardous construction waste generated by the building's design and on-site construction and off-site manufacture or fabrication (excluding demolition and excavation waste) is no greater than the exemplary level resource efficiency benchmark The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmark. All key waste groups are identified for diversion from landfill in the RMP.</p>	<p>A copy of the compliant Resource Management Plan containing the appropriate bench marks, commitments and procedures and, where relevant a copy of the pre-demolition OR</p> <p>A copy of relevant specification clauses that require the principal contractor to produce a RMP in line with requirements; contains the detailed requirements with respect to resource efficiency benchmarks and targets and procedures to be included in the RMP.</p> <p>A consistent record of all demolition and construction waste generated, along with diversion / recycling rates. Include details of waste management and recycling facility.</p>	3	2.83%	0	0.00%	These requirements have been included in the Contractor tender documentation. Two credits is a realistic target for construction resource efficiency, but anything beyond this will be difficult for the Contractor to achieve due to the constraints of the site.
WST 02	Recycled Aggregates	AKT II	<p>One Credit - Recycled Aggregates (Not targeted) The total amount of recycled or secondary aggregate specified, is greater than 25% (by weight or volume) of the total high grade aggregate specified for the development. Where the minimum level is not met for an application, all the aggregate in that application must be considered as primary aggregate when calculating the total high grade aggregate specified.</p>	<p>A copy of the relevant specification or contract clause confirming recycled and secondary aggregate use requirements for the project OR Calculation confirming the amount of recycled or secondary aggregate to be used.</p> <p>Formal written confirmation from the design team or main contractor of the source of recycled/secondary aggregates and that the required amount and quality can be obtained from this source.</p>	0	0.00%	0	0.00%	G&T have conducted a feasibility assessment for the use of recycled aggregates and determined that this credit would be very difficult to achieve based on industry feedback. Based on this the credit will not be targeted.
WST 03	Operational waste	BDP	<p>One Credit - Operational Waste (Likely) Centralised waste storage area should be present on site for the segregation and storage of recyclables. The space must be clearly labelled to assist with segregation, accessible to building occupants or facilities operators, and of a capacity appropriate to the building's size and number of occupants.</p> <p>Total area (m2) of the storage area should be an appropriate size to meet BREEAM criteria.</p>	<p>Marked up building site plan confirming the location and size of the dedicated recyclable storage area and the storage area for general waste, as well as other waste facilities present.</p> <p>Project team meeting minutes / letter confirming likely building waste streams and indicative volumes.</p>	1	0.94%	0	0.00%	There is likely to be a suitably sized storage space for recyclables on site. As the building will be over 5,000m ² and have catering areas, BREEAM recommends that at least 20m ² should be dedicated to the storage of operational recyclable waste volumes. BDP Basement Team to provide plans and details of what storage will be available for the different types of recyclables.
WST 04	Speculative Floor and Ceiling Finishes	BDP, BIG, Google	<p>One credit - Speculative floor and ceiling finishes (Likely) For tenanted areas (where the future occupant is not known), prior to full fit-out works, carpets, other floor finishes and ceiling finishes have been installed in a show area only.</p> <p>In a building developed for a specific occupant, that occupant has selected (or agreed to) the specified floor and ceiling finishes.</p>	<p>Design drawings and/or relevant section/clauses of the building specification or contract. AND/OR A letter from the client, project team or building user where the future occupant is known.</p>	1	0.94%	0	0.00%	If Google is satisfied with the finishes specified, then confirmation from them is all that would be required to close out this credit.
WST 05	Adaptation to climate change	AKT II	<p>One Credit - Structural and Fabric Resilience (Likely) Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent) including a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts.</p>	<p>Provide a copy of the climate change adaptation strategy appraisal.</p>	1	0.94%	0	0.00%	AKT have produced a design note setting out the Structural and Fabric Resilience Strategy for the building, based on the likely weather hazards identified.
WST 06	Functional adaptability	BDP	<p>One Credit - Functional Adaptability (Likely) A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation. Functional adaptation measures have been implemented (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor.</p>	<p>Functional adaptation strategy.</p> <p>Evidence showing how these functional adaptation measures have been implemented into the design of the building, e.g. drawings or written narratives.</p>	1	0.94%	0	0.00%	The Stage 2 report proposed a variety of functional adaptation measures for consideration. In order for the credit to be fully closed out, it must be demonstrated that these measures have been integrated into the design of the building prior to the end of Stage 4.
Total Section Score:					7	6.61%	0	0.00%	

Summary of BREEAM requirements: Land Use and Ecology

Land Use and Ecology

Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
LE 01	Site selection	Argent	<p>One Credit - Previously Occupied Land (Likely) At least 75% of the proposed development's footprint is on an area of land which has previously been occupied by industrial, commercial or domestic buildings or fixed surface infrastructure.</p> <p>One Credit - Contaminated Land (Likely) A site investigation, risk assessment and appraisal have deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified the degree and source of the contamination, as well as options for remediation. Remediation was carried out in compliance with the relevant standards.</p>	<p>Previously Occupied Land Existing site plan and/or site photographs confirming previous land use and area (m²) of that use. A proposed site plan showing the location and footprint of the proposed development and temporary works.</p> <p>Contaminated Land A copy of the site investigation and assessment report. Evidence of remediation works in compliance with the relevant standards.</p>	2	2.00%	0	0.00%	<p>Documentation previously collected has been provided and demonstrates compliance with the previously occupied land credit.</p> <p>It is understood that criteria can be met through previous reporting and remediation works. Argent to provide contamination and remediation report. This may require a review and quick update before being sent.</p>
LE 02	Protection of ecological features	Argent, Ecologist Principal Contractor	<p>One Credit - Ecological Value of Site (Likely) Suitably Qualified Ecologist to identify the land as being of 'low ecological value' within an ecological assessment report, based on a site survey.</p> <p>One Credit - Protection of Ecological Features (Likely) All existing features of ecological value surrounding construction zone and site boundary to be adequately protected by barriers. Contractor to construct ecological protection prior to any preliminary site construction or preparation works.</p>	<p>One Credit - Ecological Value of Site A copy of the Ecologist's report confirming the low ecological value of the site and recommended protection of ecological features surrounding the construction zone. Confirmation of Ecologist's qualifications.</p> <p>One Credit - Protection of Ecological Features Written confirmation of the protection measures put in place and that they are in line with BS42020: 2013.</p>	2	2.00%	0	0.00%	<p>Argent have advised that an Ecologist will be appointed and an ecological assessment carried out. MM have sent Argent the detailed criteria to allow a clear scope to be set out.</p> <p>Argent to advise when the Ecologist has been appointed.</p> <p>The criteria for the protection of ecological features should be included in the Contractor tender documentation, if this is determined by the Ecologist as a relevant requirement.</p>
LE 03	Minimising impact on existing site ecology	Argent, Ecologist	<p>Up to Two Credits - Change in Ecological Value (2 credits likely) SQE to include details for input into the BREEAM LE03 calculator : Where a Suitably Qualified Ecologist (SQE) has been appointed and, based on their site survey, they confirm the following and either the assessor or ecologist inputs this data in to the BREEAM LE 03/LE 04 calculator: - Broad habitat types that define the landscape of the assessed site in its existing pre-developed state and proposed state. - Area of the existing and proposed broad habitat plot types - Average total taxon (plant species) richness within each habitat type.</p>	Design drawings including proposed and existing site plan / survey and a completed copy of LE03/04 Calculator signed and dated by the ecologist.	2	2.00%	0	0.00%	<p>Argent have advised that an Ecologist will be appointed and an ecological assessment carried out. MM have sent Argent the detailed criteria to allow a clear scope to be set out.</p> <p>Argent to advise when the Ecologist has been appointed.</p>
LE 04	Enhancing site ecology	Argent, Ecologist Ecologist and Google	<p>One Credit - Ecologist's Report and Recommendations (Likely) An SQE has been appointed and reported on enhancing and protecting the ecology of the site. The general recommendations of the ecology report, which should be produced based on a site survey at RIBA Stage 2, to be implemented by the project team.</p> <p>One Credit - Increase in Ecological Value (Likely) The general recommendations of the ecology report have been implemented into the final design and will result in an increase of six plant species or greater and this is calculated using the BREEAM LE 03/LE 04 calculator.</p>	<p>One Credit - Ecologist's Report and Recommendations A copy of the Ecologist's report Design drawings including proposed and existing site plan / survey.</p> <p>One Credit - Increase in Ecological Value Written confirmation from the client / design team confirming how the ecologist's recommendations will be implemented. A completed copy of the LE03/04 Calculator to determine number of credits.</p>	2	2.00%	0	0.00%	<p>Argent have advised that an Ecologist will be appointed and an ecological assessment carried out. MM have sent Argent the detailed criteria to allow a clear scope to be set out.</p> <p>Argent to advise when the Ecologist has been appointed.</p>
LE 05	Long term impact on biodiversity	Argent, Ecologist and Principal Contractor	<p>Up to two credits (2 credits likely) 1. An SQE appointed and confirms all relevant legislation has been complied too. 2. Produce a landscape and habitat management plan to cover the first 5 years after project completion - to be handed to building occupants. 3. The amount of additional criteria met will determine the number of credits achieved.. Many of these are the responsibility of the appointed Principal Contractor.</p>	<p>A copy of the site's landscape and habitat management plan; OR Relevant sections / clauses of the building specification or contract confirming its development and scope; OR A letter from the client confirming a commitment to produce the management plan and its' scope.</p> <p>A letter of commitment from the Principal Contractor confirming that they will undertake / meet the additional requirements. Must specifically state which are targeted.</p>	2	2.00%	0	0.00%	<p>Argent have advised that an Ecologist will be appointed and an ecological assessment carried out. MM have sent Argent the detailed criteria to allow a clear scope to be set out.</p> <p>Argent to advise when the Ecologist has been appointed.</p> <p>The additional requirements deemed applicable to the project by the Ecologist should be included in the Contractor tender documentation.</p>
Total Section Score:					10	10.00%	0	0.00%	

Summary of BREEAM requirements: Pollution

Pollution									
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
POL 01	Impact of refrigerants	Atelier Ten, SHW	<p>Up to Two Credits - Impact of Refrigerants (1 credit likely) (1 credit possible) Two credits Systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of ≤100 kgCO2e /kW cooling/heating capacity. OR The air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10.</p> <p>One credit Systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of ≤1000 kgCO2e /kW cooling/heating capacity</p> <p>One Credit - Leak Detection (Likely) A refrigerant leak detection and containment system should be included within the specification.</p>	<p>Copies of the relevant specification clauses confirming either the absence of refrigerant in the development or the types of refrigerant to be used. Manufacturer's information confirming the GWP of each refrigerant.</p> <p>Completed copy of the Pol 01 calculator tool</p> <p>Specification detailing the leak detection system.</p>	2	1.54%	1	0.77%	<p>A10 have advised that HFO1234ze is being considered as a replacement for R134a for the refrigerant chiller. This refrigerant has a very low GWP which would reduce the Direct Effect Life Cycle CO₂ equivalent emissions (DELCO₂e) to below 100 kgCO₂e/kW cooling/heating capacity.</p> <p>However, A10 have identified that this will reduce the chiller efficiency, which will affect the energy performance of the building as assessed under Ene 01. As achieving 8 credits for Ene 01 is a minimum standard required for Outstanding, it is important that complying with this Pol 01 credit will not have a negative impact.</p> <p>MM have discussed the credit requirements with SeftonHornWinch, who confirm that the catering equipment will be specified in line with the Pol 01 requirements.</p>
POL 02	NOx emissions	-	<p>Up to three credits (Not Targeted) Where the plant installed to meet the building's delivered heating and hot water demand has, under normal operating conditions, a NOx emission level (measured on a dry basis at 0% excess O2) as follows: ≤ 100 mg/kWh = 1 Credit ≤ 70 mg/kWh = 2 Credits ≤ 40 mg/kWh = 3 Credits</p>	<p>Relevant specification clauses confirming the type of heating system(s) installed.</p> <p>Manufacturer's details confirming the dry NOx emissions rate in mg/kWh (Where more than one system is providing heat and calculations are required to confirm the average NOx emission rate)</p>	0	0.00%	0	0.00%	<p>District heating will be utilised by the building. District heating systems usually have NOx emission rates higher than required by BREEAM. The NOx emissions provided by Metropolitan confirm this to be the case.</p> <p>Therefore compliance will not be met.</p>
POL 03	Surface water Run off	Gillespies	<p>Up to Two Credits - Flood Resilience (2 credits likely) Where a site-specific flood risk assessment (FRA) confirms the development is situated in a flood zone that is defined as having a low annual probability of flooding (in accordance with current best practice national planning guidance). The FRA must take all current and future sources of flooding into consideration OR In a medium/high risk zone appropriate flood resilience and resistance measures are put in place.</p> <p>Two Credits - Surface Water Run-off (2 credits likely) An appropriate consultant confirms drainage measures are specified to ensure that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events. Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance).</p> <p>One Credit - Minimising Watercourse Pollution (Likely) There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). In areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.</p>	<p>Flood Resilience - A copy of the flood map or flood risk assessment confirming the flood zone or annual probability of flooding in the site location. - A copy of the flood risk assessment and site plans confirming: the design flood level for the site; the design ground levels for all developed areas of the site; safe access and escape routes. - Correspondence from the appropriate statutory body confirming a reduced annual probability of flooding due to flood defences where applicable.</p> <p>Surface Water run off credits Consultant's report containing all information necessary to demonstrate compliance including: 1) Type and storage volume (L) of the drainage measures. 2) Total area of hard surfaces (m2) 3) Peak/volume flow rates (l/s) pre and post development for the return periods. 4) Additional allowance for climate change designed into the system. 5) Impact on the building of flooding from local drainage system failure.</p> <p>Minimising Watercourse Pollution Consultant's report detailing the design specifications, calculations and drawings to support the 5mm rainfall discharge criteria. Design drawings and/or relevant section/clauses of the building specification or contract indicating: 1) High and low risk areas of the site 2) Specification of SuDS, source control system soil/petrol interceptors and shut off valves as appropriate.</p> <p>Confirmation is required within the reports confirming that water pollution prevention systems are designed in accordance with PPG3 and the SuDS manual (where appropriate).</p>	5	3.85%	0	0.00%	<p>These flood resilience and surface water run-off credits have been documented on a site wide basis by PBA. Compliance with these credits has been achieved.</p> <p>However, compliance with the minimising watercourse pollution credit cannot be achieved on a site wide basis, as some criteria will not be met. This must be documented specifically for the KGX1 site. Gillespies to advise how the green roof will affect compliance.</p>

POL 04	Reduction of night time light pollution	BDP	<p>One credit (Likely)</p> <p>The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.</p> <p>If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes.</p>	<p>Design drawings, along with the relevant section / clauses of the specification or alternatively the external lighting design data / calculations.</p> <p>M&E engineer to provide indicative examples of where and how the external lighting design strategy complies with the assessment criteria.</p>	1	0.77%	0	0.00%	The ILP Guidance Notes should not be too challenging to achieve, however MM can provide further guidance to the team if necessary.
POL 05	Reduction of noise pollution	Sandy Brown	<p>One Credit (Likely)</p> <p>1. When there are no noise-sensitive areas within 800m of the development OR 2. A noise impact assessment should be undertaken by a qualified acoustician in compliance with BS 7445:1991 to measure existing background noise levels and rate the noise level resulting from the new development.</p> <p>Acoustician to be appointed and carry out this assessment.</p>	<p>Site plan highlighting all existing and proposed noise-sensitive buildings local to (and within) the site boundary; Proposed sources of noise from the new development; Distance (m) from these buildings to the assessed development.</p> <p>A copy of the acousticians report to include the acoustician's qualifications and professional status</p> <p>Relevant specification clauses requiring a noise assessment in compliance with BS4142:1997 by a suitably qualified acoustician; OR Formal written confirmation from the design team confirming the same.</p>	1	0.77%	0	0.00%	The credit requirements have been sent to Sandy Brown and they will develop the required evidence accordingly.
Total Section Score:					9	6.92%	1	0.77%	

Summary of BREEAM requirements: Innovation

Innovation

Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Notes and comments
Innovation	Innovation	Project Team	<p>Man 03 - Responsible Construction Practices (Likely) The Principal Contract achieves a CCS score of at least 40, with a score of at least 7 in each section.</p> <p>Man 05 - Aftercare (Likely) There is (or will be) operational infrastructure and resources in place to co-ordinate the following activities at quarterly intervals for the first three years of building occupation: a. Collection of occupant satisfaction, energy consumption and water consumption data. b. Analysis of the data to check the building is performing as expected and make any necessary adjustments to systems controls or to inform building user behaviours. c. Setting targets for reducing water and energy consumption and monitor progress towards these. d. Feedback any 'lessons learned' to the design team and developer for use in future projects. e. Provision of the actual annual building energy, water consumption and occupant satisfaction data to BRE.</p> <p>Wat 01 - Water Consumption (Possible) This can be achieved where a 65% improvement can be shown. This would be in line with the Droid Avengers requirements.</p> <p>Mat 01 - Life Cycle Impacts (Two Credits Likely) Where the design team has used an IMPACT compliant software tool (or equivalent) to measure the environmental impact of the building. Where the design team can demonstrate how the use of an IMPACT compliant software (or equivalent) has benefited the building in terms of measuring and reducing its environmental impact. Where the design team submit the building information model (BIM) from the IMPACT compliant software tool (or equivalent) for the assessed building to BRE Global.</p>	<p>As defined within existing BREEAM issues.</p> <p>One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an Approved Innovation application form.</p>	4	4.00%	1	1.00%	<p>Man 03 Exemplary Performance criteria have been inputted into the Contractor tender documentation.</p> <p>Man 05 will require client involvement. This will purely be a monitoring exercise, there are targets to be met and the data will not be made public. This should be a relatively straightforward credit to achieve. Argent to check Google would be content to carry this out.</p> <p>MM have carried out calculations to determine current performance. As it stands, greywater and 4.5/3 litre dual flush WCs could be utilised to achieve 5 credits and exemplary performance.</p> <p>Sturgis have confirmed that they have worked on the Mat 01 Exemplary performance requirements before. They have previously received confirmation from the BRE that their software tool is compliant with the criteria.</p> <p>Sturgis to carry out the assessment to show compliance.</p>
Total Section Score:					4	4.00%	1	1.00%	

Recommendations

Project title:	Google KGX1
Project description:	BREEAM Recommendations
Rating system used:	BREEAM New Construction 2014
Date of latest issue:	20 January 2017

Outlined below are the additional credits that are believed to be within reach of the project based on our understanding of the current design and construction approach. These credits have been grouped based on the relative cost and programme implications associated with them. Credits that have not been included below have been deemed too onerous or costly

Current predicted score: 86.64% Current predicted BREEAM rating: Outstanding (with no margin)

Indicative Score - Low impact: 88.52% Modified predicted rating: Outstanding (with margin-recommended)

Indicative Score - Low and Medium impact: 89.40% Modified predicted rating: Outstanding (with margin-recommended)

Indicative Score - Low, Medium and High impact: 94.33% Modified predicted rating: Outstanding

Indicative Score - Low, Medium, High and Unknown impact: 94.33% Modified predicted rating: Outstanding

BREEAM Credit	Additional credits achievable	Contribution to final score	Notes
Additional credits with low cost, programme or technical implications			
Hea01 - Visual Comfort	1	0.88%	With regards to the views out, analysis by BDP has found that the majority of areas in the building meet the requirements, and MM have received confirmation from the BRE that the kitchen spaces can be excluded from the calculations. As the layout of the building may change throughout the design, this will be monitored to see how it affects compliance.
Wat01 - Water consumption (Exemplary Performance)	1	1.00%	MM have carried out calculations to determine current performance. As it stands, greywater and 4.5/3 litre dual flush WCs could be utilised to achieve 5 credits and exemplary performance.
TOTAL	2	1.88%	
Additional credits with medium cost, programme or technical implications			
Hea06 - Safety and Security (Security)	1	0.88%	MM confirm that recommendations made by Cornerstone must be incorporated in the design to meet the Security credit. If not, justification must be given as to why these cannot be included - economic reasons are not acceptable. Additional recommendations have been provided by Cornerstone. BDP/BIG to demonstrate that these will be implemented in to the project's design.
TOTAL	1	0.88%	
Additional credits with high cost, programme or technical implications			
Mat01 - Life Cycle Impacts	2	2.08%	Products with EPDs do help to uplift the score under this issue, and so it is something to keep in mind while specifying materials as it also goes towards LEED compliance. No further credits are to be deemed likely at this stage but consideration should be given as the design progresses

Mat03 - Responsible Sourcing of Materials	2	2.08%	It has been identified by G&T that achieving these two extra credits may limit the variety of materials that can be specified by the design team. G&T have identified that an extra £2.5 million would be required to secure these credits
Pol01 - Impact of Refrigerants	1	0.77%	A10 have advised that HFO1234ze is being considered as a replacement for R134a for the refrigerant chiller. This refrigerant has a very low GWP which would reduce the Direct Effect Life Cycle CO ₂ equivalent emissions (DELC CO ₂ e) to below 100 kgCO ₂ e/kW cooling/heating capacity. However, A10 have identified that this will reduce the chiller efficiency, which will affect the energy performance of the building as assessed under Ene 01. As achieving 8 credits for Ene 01 is a minimum standard required for Outstanding, it is important that complying with this Pol 01 credit will not have a negative impact.
TOTAL	5	4.93%	
Additional credits with unknown cost, programme or technical implications			
TOTAL	0	0.00%	

Issue and revision record

<u>Revision</u>	<u>Date</u>	<u>Originator</u>	<u>Checker</u>	<u>Approver</u>	<u>Description</u>
0	5th July 2016	L. Aminu	A. Courreges	E. Gulacsy	Stage 2 issue
1	23rd September 2016	L. Aminu	J. Binks	E. Gulacsy	Updated issue
2	12th October 2016	L. Aminu	J. Binks	E. Gulacsy	Updated issue
3	24th October 2016	L. Aminu	J. Binks	E. Gulacsy	Updated issue
4	20th January 2017	L. Aminu	J. Binks	E. Gulacsy	Stage 3 issue
		<i>L. Aminu</i>	<i>Binks</i>	<i>E. Gulacsy</i>	

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C. BREEAM Pre-assessment (Retail)

Google KGX1 Retail Façade

BREEAM Project Report
Document Number:
Rev B

BREEAM Project Summary

Project Name:	Google KGX1 Retail Façade
Project description :	BREEAM Certification
Rating system used :	BREEAM 2018 for New Construction - Shell Only
Date of latest issue :	28 January 2022

Current predicted BREEAM score: 47.36%

Current potential BREEAM score: 71.22%

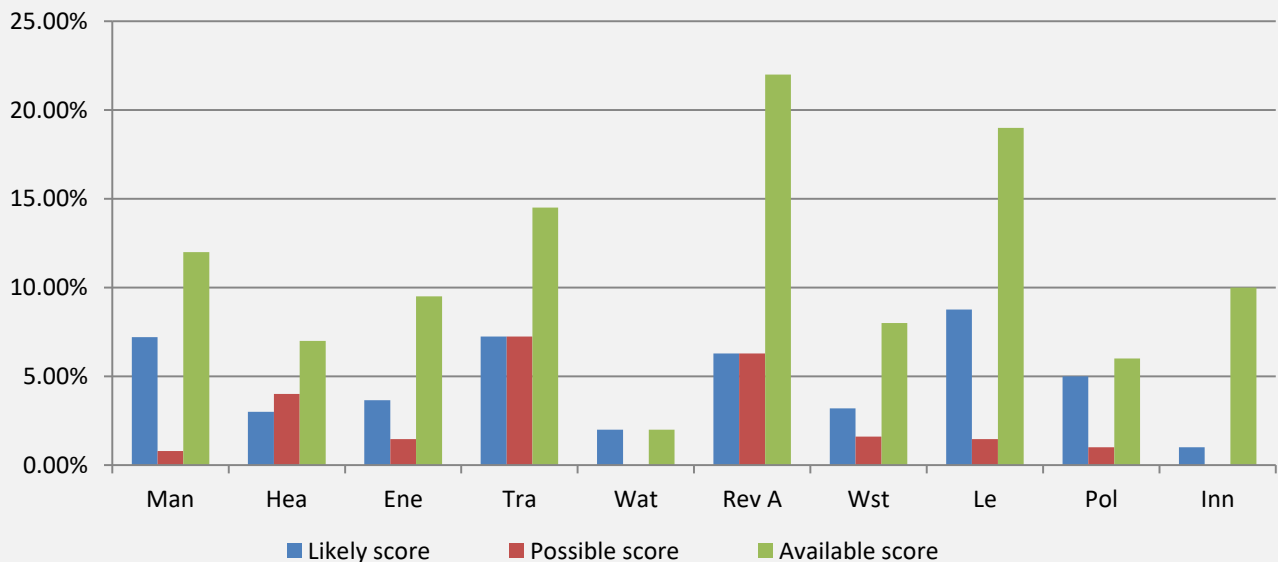
Current predicted BREEAM rating: BREEAM Good

Current potential BREEAM rating: BREEAM Excellent

This report presents the current status of the project in terms of likely BREEAM rating and is expected to be updated on a regular basis, as the submission process progresses.

Summary of BREEAM credits

Category	Credits available	Available score	Individual credit weighting	Credits likely	Credits possible	Likely score	Possible score	Credits secured
Man	15	12.00%	0.80%	9	1	7.20%	0.80%	0.00%
Hea	7	7.00%	1.00%	3	4	3.00%	4.00%	0.00%
Ene	13	9.50%	0.73%	5	2	3.65%	1.46%	0.00%
Tra	12	14.50%	1.21%	6	6	7.25%	7.25%	0.00%
Wat	2	2.00%	1.00%	2	0	2.00%	0.00%	0.00%
Rev A	14	22.00%	1.57%	4	4	6.29%	6.29%	0.00%
Wst	10	8.00%	0.80%	4	2	3.20%	1.60%	0.00%
Le	13	19.00%	1.46%	6	1	8.77%	1.46%	0.00%
Pol	6	6.00%	1.00%	5	1	5.00%	1.00%	0.00%
Inn	10	10.00%	1.00%	1	0	1.00%	0.00%	0.00%
Total	102	110%		45	21	47.36%	71.22%	0.00%



BREEAM Minimum Standards Summary

BREEAM Issue	Pass	Good	Very Good	Excellent	Outstanding
Man 03 - Responsible Construction Practices	None	None	None	One credit (Responsible Construction)	Two credits (Responsible Construction)
Man 04 - Commissioning and Handover	None	None	Criterion 11 (Building User Guide)	Criterion 11 (Building User Guide)	Criterion 11 (Building User Guide)
Ene 01 - Reduction of Energy Use and Carbon Emissions	None	None	None	Four credits (Energy Performance or Prediction of operational energy consumption*)	Six credits (Energy Performance or Prediction of operational energy consumption*)
Wat 02 - Water Monitoring	None	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat 03 - Responsible Sourcing of Construction Products	Criterion 1 only (Timber Sourcing)	Criterion 1 only (Timber Sourcing)	Criterion 1 only (Timber Sourcing)	Criterion 1 only (Timber Sourcing)	Criterion 1 only (Timber Sourcing)
Wst 01 - Construction Waste Management	None	None	None	None	One credit
Wst 03 - Operational Waste	None	None	None	One credit	One credit

Summary of BREEAM requirements: Management

Management													
Issue ref.	Credit title	RIBA Stage	Resp. Party	Minimum Mandatory Requirements	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
MAN 01	Project Brief and Design	RIBA Stage 2 RIBA Stage 2 RIBA Stage 1 RIBA Stage 4-6	Project Manager Project Manager, Client	N/A	<p>One Credit - Project Delivery Planning - LIKELY Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.</p> <p>One Credit - Stakeholder Consultation (Interested Parties) - NOT TARGETED 1. Prior to completion of the Concept Design stage, all relevant third party stakeholders have been consulted by the design team and this covers the minimum consultation content. 2. The project must demonstrate how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the Initial Project Brief and Concept Design. 3. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), consultation feedback has been given to, and received by, all relevant parties.</p> <p>Pre-requisite for BREEAM AP - NOT TARGETED Strategic sustainability performance targets should be agreed upon design stage.</p> <p>One Credit - BREEAM AP (Concept Design) - NOT TARGETED A BREEAM AP has been appointed to facilitate the setting and achievement of BREEAM performance target(s) for the project. The design stage Sustainability Champion is appointed to perform this role during the feasibility stage (Stage 1, Preparation and Brief stage, as defined by the RIBA Plan of Work 2013 or equivalent).</p> <p>One Credit - BREEAM AP (Developed Design) - NOT TARGETED A BREEAM AP is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process and formally report progress to the client and design team.</p>	<p>Project Delivery Planning 1. Project Delivery plan setting out the process and scope of the project, and the roles of the project team. 2. Minutes from early stage meetings, demonstrating early stage contribution of project team.</p> <p>Stakeholder Consultation (Interested Parties) 1. A list of the stakeholders consulted. 2. A consultation plan setting out the process and the scope of the consultation. 3. Agenda/minutes from consultation meetings. 4. Documentation demonstrating consultation feedback and subsequent actions.</p> <p>Pre-requisite for BREEAM AP The BREEAM AP appointment letter, as well as documentation confirming that the defined BREEAM performance target(s) has been formally agreed between the client and design/project team at an appropriate time.</p> <p>BREEAM AP (Concept Design) Documentation confirming that the BREEAM AP is monitoring progress. This could be demonstrated by: 1. Meeting Minutes 2. Recorded Correspondence 3. BREEAM AP Reports 4. Relevant sections/clauses in the building specification</p> <p>BREEAM AP (Developed Design) Same as above for Concept Design.</p>	1	0.80%	0	0.00%	0	0.00%	
MAN 02	Life Cycle Cost and Service Life Planning	RIBA Stage 2 RIBA Stage 4	Cost Consultant	N/A	<p>Two Credits - Elemental Life Cycle Cost (LCC) - NOT TARGETED An elemental life cycle cost (LCC) analysis has been carried out, at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.</p> <p>One Credit - Component Level LCC Plan - POSSIBLE A component level LCC plan has been developed by the end of Process Stage 4 (equivalent to Technical Design - RIBA Stage 4) in line with PD 156865:2008 and includes the following component types (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection.</p> <p>One Credit - Capital Cost Reporting - LIKELY Report the capital cost for the building in pounds per square metre (£/m²), via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section.</p>	<p>Elemental Life Cycle Cost (LCC) Elemental life cycle cost plan</p> <p>Component Level LCC Plan Component level life cycle cost plan</p> <p>Capital Cost Reporting BREEAM Assessment Scoring and Reporting tool reporting the capital cost for the building in pounds per square metre (£/m²).</p>	1	0.80%	1	0.80%	0	0.00%	To be confirmed by the cost consultant if the requirements for the Component Level LCC Plan have been scoped for within their work package.
MAN 03	Responsible Construction Practices		Principal Contractor	<p>Outstanding - Two credits (Responsible Sourcing)</p> <p>Excellent - One credit (Responsible Sourcing)</p> <p>Very Good - None</p> <p>Good - None</p> <p>Pass - None</p>	<p>Pre-requisite - Legally harvested and traded timber - LIKELY All timber and timber based products used on the project is 'legally harvested and traded timber'</p> <p>One Credit - Environmental Management - LIKELY The principal contractor operates an environmental management system (EMS) and implement best practice pollution prevention policies on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG6.</p> <p>One Credit - BREEAM AP (Site) - LIKELY 1. The client and the contractor formally agree performance targets. 2. A BREEAM AP is appointed to monitor the project and BREEAM target(s), during the Construction, Handover and Close Out stages (as defined by the RIBA Plan of Works 2013, stages 5 and 6).</p> <p>Up to Two Credits - Responsible Construction Management - TWO CREDITS LIKELY The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks.</p> <p>Up to Two Credits - Monitoring of Construction, Site Impacts - TWO CREDITS LIKELY 1. Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy use, water consumption and transport data resulting from all on-site construction processes throughout the build programme. 2. To ensure the robust collection of information, this individual(s) must have the appropriate authority and responsibility to request and access the data required. Where appointed, the Sustainability Champion could perform this role.</p>	<p>All Credits A signed and dated letter or relevant section/clauses of the building specification confirming a commitment to meet the relevant criteria.</p>	6	4.80%	0	0.00%	0	0.00%	Requirements are to be included as part of the contractor requirements documentation, to provided within the tender package.
MAN 04	Commissioning and Handover		Principal Contractor		<p>One Credit - Testing and Inspecting Building Fabric - LIKELY The integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths is quality assured through completion of post construction testing and inspection.</p>	<p>Testing and Inspecting Building Fabric - LIKELY Letter of commitment to carry out a thermographic survey and an airtightness test and inspection.</p>	1	0.80%	0	0.00%	0	0.00%	
Total Section Score:							9	7.20%	1	0.80%	0	0.00%	

Summary of BREEAM requirements: Health and Wellbeing

Health and Wellbeing												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
HEA 01	Visual comfort	N/A	Mechanical Engineer Architect Electrical Engineer	<p>Up to two credits - Daylighting - TWO CREDITS POSSIBLE</p> <p>The relevant building areas meet the following good practice daylight factor(s):</p> <ol style="list-style-type: none"> 1. Average Daylight Factor of 2% for at least 80% of the regular floor area AND 2. A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the relevant average daylight factor. OR 3. At least 80% of the room has a view of sky from desk or table top height and the room depth criterion $d/w + d/HW < 2$ (1-RB) is satisfied. 4. At least 80% of the room has 300 lux for 2000 hours per year or more <p>One credit - Views out - POSSIBLE</p> <ol style="list-style-type: none"> 1. 95% of the floor area in relevant building areas is within 8m of a wall with a permanent opening that provides an adequate view out. 2. The window/opening must be $\geq 20\%$ of the surrounding wall area. Where the room depth is greater than 8m, refer to credit link for further detailed explanation. 3. The view out must be a view of a landscape or buildings (rather than just the sky) at seated eye level (1.2–1.3m) within the relevant building areas and should ideally be through an external window. <p>One Credit - External Lighting - LIKELY</p> <p>All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.</p>	<p>Daylighting</p> <ol style="list-style-type: none"> 1. Design drawings. 2. Daylight calculations. <p>Views Out</p> <ol style="list-style-type: none"> 1. Design drawings and calculations 2. Daylighting 3. Design drawings. 4. Daylight calculations. <p>Internal and External Lighting</p> <ol style="list-style-type: none"> 1. Relevant section/clauses of the building specification or contract OR a letter of formal confirmation of compliance from the relevant design team member. 2. Design drawings 	1	1.00%	3	3.00%	0	0.00%	Requirements were achieved as part of the base build and so expected to be achieved as part of the Retail Façade project.
HEA 05	Acoustic performance	N/A	Acoustician	<p>One Credit - Acoustic Performance - LIKELY</p> <p>The building meets the appropriate acoustic performance standards and testing requirements defined in the checklists and tables section which defines criteria for the acoustic principles of:</p> <ol style="list-style-type: none"> 1. Indoor ambient noise level 	<ol style="list-style-type: none"> 1. Professional report/study and calculations from the acoustician. 2. Letter of appointment / confirmation demonstrating when the acoustician was appointed. 3. Acoustician CV 4. Relevant section / clauses of the building specification or contract and / or formal letter from the project team regarding commitments and confirmation that the relevant performance standards. 5. Written confirmation from the third party verifier that they comply with the definition of an SQA is required 6. Compliance test body: accredited by a member of the International Accreditation Forum OR ANC Registration Scheme OR can provide evidence that they follow the relevant principles of BS EN ISO/IEC 17024 	1	1.00%	0	0.00%	0	0.00%	An acoustician is to be appointed to undertake the reporting to confirm the credit can be achieved.
HEA 06	Security	RIBA Stage 2	Client	<p>One credit - Security of Site and Building - POSSIBLE</p> <ol style="list-style-type: none"> 1. A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). 2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. 3. The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. <p>The scope of the recommended security controls:</p> <ul style="list-style-type: none"> - Design and layout (e.g. crime prevention through environmental design) - Physical security (e.g. tested and certified security products) - Technological security (e.g. Tested and certified alarms, automatic access control systems, CCTV) 	<ol style="list-style-type: none"> 1. A copy of the SNA from the SQSS confirming the scope of their advice /involvement, the stage of design at which their advice was sought and a summary of their recommendations. 2. A marked up copy of the site/design plans highlighting examples of conformity with SQSS recommendations; OR a copy of the specification clause confirming that the development will conform with SQSS recommendations. 	0	0.00%	1	1.00%	0	0.00%	This has been achieved on the base build and fit-out projects but with individual tenants taking on the spaces this makes the credit more complex to achieve.
HEA 07	Safe and Healthy Surroundings	N/A	Architect	<p>One credit - Safe access - LIKELY</p> <ol style="list-style-type: none"> 1. Dedicated cycle paths and footpaths: direct access from the site entrance(s) to the building entrance(s) or cycle storage 2. Dedicated pedestrian crossings: pedestrian routes cross vehicle access routes 3. Pedestrian drop-off areas: access to roads and direct access to other footpaths. 4. Delivery areas: not accessed through general parking areas and do not cross pedestrian and cyclist paths. They also must not share outside amenity areas accessible to building users and general public. 5. Dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site. 	<p>Safe access</p> <ol style="list-style-type: none"> 1. Marked up site plans 	1	1.00%	0	0.00%	0	0.00%	Requirements were achieved as part of the base build and so expected to be achieved as part of the Retail Façade project.
Total Section Score:						3	3.00%	4	4.00%	0	0.00%	

Summary of BREEAM requirements: Energy

Energy												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
ENE 01	Reduction of Energy Use and CO2 emissions	N/A	Mech. Engineer	Up to Nine Credits - Energy performance - FOUR CREDITS LIKELY Calculate the Energy Performance Ratio for New Construction (EPR _{nc}). To achieve any rating, a EPRnc of at least 0.1 would be required To achieve 'Excellent', a EPRnc of at least 0.4 would be required. To achieve 'Outstanding', a EPRnc of at least 0.60 would be required.	Energy performance 1. A copy of the Building Regulations Output Document from the approved software. The output documents must be based on the design stage of analysis. 2. A copy of the Building Regulations Output 3. Completed Ene01 calculator	4	2.92%	0	0.00%	0	0.00%	
ENE 03	External lighting	N/A	Electrical Engineer	One Credit - LIKELY No external lighting (which includes lighting on the building, at entrances and signs) OR External light fittings within the construction zone with: - Initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt - Automatic control to prevent operation during daylight hours - Presence detection in areas of intermittent pedestrian traffic.	1. Marked up site plan and building elevations showing the location and purpose of all external light fittings. 2. Lighting specification or lighting designer's calculations confirming the lamp lumens/circuit watt for each type of fitting as well as the colour rendering index (where appropriate) 3. The external lighting control strategy	1	0.73%	0	0.00%	0	0.00%	Requirements were achieved as part of the base build and so expected to be achieved as part of the Retail Façade project.
ENE 04	Low Carbon Design	RIBA Stage 2 RIBA Stage 2 RIBA Stage 2	Mech. Engineer / Architect Mech. Engineer	Two Credits - Passive Design. One Credit: Passive Design Analysis - POSSIBLE 1. Achieve the first credit: Hsa 04 Thermal comfort: One credit - Thermal modelling. 2. Identify opportunities for the implementation of passive design measures during Concept Design and implement measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption. 4. Quantify the reduced total energy demand and carbon dioxide (CO ₂ -eq). One Credit: Free Cooling - NOT TARGETED 1. Include a free cooling analysis to the passive design analysis. 2. Identify opportunities for the implementation of free cooling solutions. 3. The building is naturally ventilated or uses a combination of the free cooling strategies. One Credit - Low Zero Carbon Feasibility Study - POSSIBLE 1. A feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist (see credit link) to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the building/development. 2. A local LZC technology/technologies has/have been specified for the building/development in line with the recommendations of this feasibility study and this method of supply results in a meaningful reduction in regulated carbon dioxide (CO ₂) emissions.	Passive Design Analysis Results from the passive design analysis including the analysis of free cooling and identified opportunities for the implementation of passive design solutions. The team demonstrate a meaningful reduction in the total energy demand through the use of passive design solutions. Free Cooling Copy of the specification/design documentation showing the use of free cooling in the development. Low Zero Carbon Feasibility Study A copy of the feasibility study report Marked up design plans or specifications confirming the proposed installation of LZC technology and manufacturers technical data (details or calculations) stating the carbon savings as a result.	0	0.00%	2	1.46%	0	0.00%	
Total Section Score:						5	3.65%	2	1.46%	0	0.00%	

Summary of BREEAM requirements: Transport

Transport												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
TRA 01	Transport assessment and travel plan	RIBA Stage 2	Client / Project Manager	<p>Two Credits - Travel Plan - POSSIBLE</p> <p>1. During the feasibility and design stages, develop a travel plan based on a site-specific travel assessment or statement.</p> <p>2. The site-specific travel assessment or statement covers:</p> <ul style="list-style-type: none"> - Travel patterns, - Transport impact of building users, - Current local environment for walkers and cyclists, - Facilities for cyclists - Disabled access - Calculation of the existing public transport Accessibility Index (AI). <p>3. The travel plan includes proposals to increase or improve sustainable modes of transport and movement of people and goods.</p> <p>4. If the occupier is known, involve them in the development of the travel plan.</p> <p>5. Demonstrate that the travel plan will be implemented post construction and be supported by the building's management in operation.</p>	A copy of the travel assessment and travel plan.	0	0.00%	2	2.42%	0	0.00%	
TRA 02	Sustainable transport measures	RIBA Stage 2 (certain criteria)	Project Manager / Architect	<p>Prerequisite - LIKELY</p> <p>Achieve criteria 3-5 under TRA01.</p> <p>10 credits - Transport Options Implementation - SIX CREDITS LIKELY, FOUR CREDITS POSSIBLE</p> <p>1. Identify the sustainable transport measures. See credit link for Table 7.4</p> <p>2. Award credits according to the existing Accessible Index (AI) of the project, and the total number of points achieved for the options implemented. See credit link for Table 7.3.</p> <p>3. Refer to credit link for Table 7.5 for requirements on cyclists facilities.</p> <p>4. Refer to credit link for Table 7.6 for requirements on amenities for different building types.</p>	Provide appropriate documentation demonstrating that the proposed sustainable transport measures are in place.	6	7.25%	4	4.83%	0	0.00%	
Total Section Score:						6	7.25%	6	7.25%	0	0.00%	

Summary of BREEAM requirements: Water

Water												
Issue ref.	Credit title	Resp. Party	Minimum Mandatory Requirements	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
WAT 02	Water monitoring	Mech. Engineer	Outstanding - Criterion 1 only (Water meter specified) Excellent - Criterion 1 only (Water meter specified) Very Good - Criterion 1 only (Water meter specified) Good - Criterion 1 only (Water meter specified) Pass - None	One Credit - Water Monitoring - LIKELY 1. The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source. 2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area. 3. Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. 4. If the construction zone is within a site that has an existing BMS, the pulsed/digital water meter(s) for the construction zone must be connected to the existing BMS	A copy of the specification clause confirming the specification and type of water meter(s) and the connection to the BMS.	1	1.00%	0	0.00%	0	0.00%	Awarded as part of preliminary design review for the BB. For this Shell & Core project, the metering strategy for the units will be the same as the BB.
WAT 03	Water leak detection and prevention	Mech. Engineer	N/A	One Credit - Leak Detection System - LIKELY A permanent, automated leak detection to be fitted on the mains water supply. The system must be able to alert building occupants of a leak, identify different flow and therefore leakage rates, be programmable to suit the owner/occupiers' water consumption criteria, designed to avoid false alarms caused by normal operation of large water-consuming plant.	1. A copy of relevant specification clauses confirming the scope and performance of leak detection systems; 2. Design drawings; 3. Manufacturer's details confirming the technical specification of the specified systems.	1	1.00%	0	0.00%	0	0.00%	Awarded as part of preliminary design review for the BB. For this Shell & Core project, the leak detection strategy for the units will be the same as the BB.
Total Section Score:						2	2.00%	0	0.00%	0	0.00%	

Summary of BREEAM requirements: Materials

Materials												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
MAT 01	Life cycle impacts	RIBA Stage 2	Carbon Consultant	<p>Up to Six Credits - Superstructure - THREE CREDITS POSSIBLE Path for Office, Industrial and Retail buildings only</p> <p>1. During Concept Design and Technical Design, carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool. Those tools are recognised by BREEAM.</p> <p>2. Submit the Concept Design Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for.</p> <p>3. Submit the Technical Design Mat 01/02 Results Submission Tool to BRE at the end of Technical Design.</p> <p>Path for all other building types</p> <p>1. During Concept Design, carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (recognised by BREEAM).</p> <p>2. For each design option, fulfil the same functional requirements specified by the client and all statutory requirements.</p> <p>3. Integrate the LCA options appraisal activity within the wider design decision-making process.</p> <p>3. Record the differences between the design options in the Mat 01/02 Results Submission Tool. Mark the option selected by the client and explain the reasons for selecting it and not selecting other options.</p> <p>4. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for.</p> <p>5. The same is to be done for the Technical Design LCA tool and Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design.</p> <p>One Credit - Substructure and hard landscaping options appraisal during Concept Design - NOT TARGETED</p> <p>1. During Concept Design identify opportunities for reducing environmental impacts: Carry out building LCA options (recognised by BREEAM) appraisal of a combined total of at least six significantly different substructure or hard landscaping design options.</p> <p>2. Follow the paths 2-4 of Path for all other building types</p>	<p>Superstructure</p> <p>1. A copy of the completed Mat 01/02 Results Submission Tool</p> <p>2. Specifications confirming a detailed description of each applicable element and its constituent materials;</p> <p>3. Design drawings or specification detailing location and area (m2) of each applicable element.</p> <p>4. The options appraisal summary document</p> <p>5. Evidence that the LCA options appraisal summary document has been received by the design team and client (meeting minutes, letter of acknowledgement)</p> <p>6. Evidence of how the LCA design options have informed the design decision-making process (e.g. meeting minutes, documented design development showing how the LCA options have affected the design).</p> <p>Substructure and hard landscaping options appraisal during Concept Design</p> <p>- The LCA options appraisal summary document includes substructure and hard landscaping according to the criteria.</p>	0	0.00%	3	4.71%	0	0.00%	Mott MacDonald have been appointed to undertake the LCA assessment for the project. This shall be undertaken as part of the Stage 4 deliverables.
MAT 02	Environmental impacts from construction products – Environmental Product Declarations (EPD)	N/A	Architect	<p>One credit - Specification of Products with a Recognised Environmental Product Declaration (EPD) - LIKELY</p> <p>Specify construction products with EPD that achieve a total EPD points score of at least 20 points. Please refer to credit link for Tables 9.8 and 9.9 to learn how to score EPD points.</p>	1. A completed copy of Mat 01/02 Results Submission Tool, including the material category classification.	1	1.57%	0	0.00%	0	0.00%	
MAT 03	Responsible sourcing of Construction Products	RIBA Stage 2	Architect	<p>Pre-Requisite - LIKELY</p> <p>All timber used on the project to be sourced in accordance with the UK Government's Timber Procurement Policy.</p> <p>One Credit - Sustainable Procurement Plan - LIKELY</p> <p>A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must be in place prior to the end of Concept Design.</p> <p>Up to 3 credits - Responsible Sourcing of Materials - ONE CREDIT LIKELY, ONE CREDIT POSSIBLE</p> <p>Credits available where specified materials comprising the main building elements are responsibly sourced in accordance with at least one BREEAM approved responsible sourcing scheme.</p>	<p>Pre-Requisite</p> <p>A letter of intent confirming that timber shall be sourced from suppliers capable of providing certification to the level required for the particular tier.</p> <p>Sustainable Procurement Plan</p> <p>Copy of the sustainable procurement plan.</p> <p>Responsible sourcing of materials</p> <p>1. Design plan or specification confirming the location of elements and materials specified and details of the materials specified.</p> <p>2. Documentary evidence detailing how the calculator tool has been completed e.g. specifications, certificates.</p> <p>3. Completed copy of the Mat 03 Calculator tool.</p>	1	1.57%	1	1.57%	0	0.00%	
MAT 05	Designing for durability and resilience	N/A	Architect	<p>One Credit - LIKELY</p> <p>1. Identification of areas, both internally and externally, where vehicular, trolley and pedestrian movement occur. Environmental damage must also be accounted for.</p> <p>2. Suitable durability and protection measures to be specified to prevent damage to vulnerable parts of the building.</p> <p>3. The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors.</p> <p>4. Please refer to credit link for Table 9.14.</p>	1. Marked up design drawings illustrating vulnerable areas/parts of the building and the durability measures specified to protect those areas.	1	1.57%	0	0.00%	0	0.00%	
MAT 06	Material Efficiency	RIBA Stage 2-5	Architect	<p>One Credit - LIKELY</p> <p>Opportunities have been identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life.</p> <p>The above is carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages:</p> <p>a. Preparation and Brief b. Concept Design c. Developed Design d. Technical Design e. Construction</p> <p>Develop and record the implementation of material efficiency during:</p> <p>a. Developed Design b. Technical Design c. Construction.</p> <p>Report the targets and actual material efficiencies achieved.</p>	Written confirmation that opportunities will be identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life at the relevant RIBA stages.	1	1.57%	0	0.00%	0	0.00%	
Total Section Score:						4	6.29%	4	6.29%	0	0.00%	

Summary of BREEAM requirements: Waste

Waste												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
WST 01	Construction waste management	RIBA Stage 2	Principal Contractor	<p>One Credit - Pre-Demolition Audit - LIKELY Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications.</p> <p>Up to Three Credits - Construction Resource Efficiency - ONE CREDIT LIKELY 1. Produce a Resource Management Plan RMP, reduce and record construction waste. 2. Principal Contractor to specify waste generation and diversion targets in line with the team's BREEAM expectations.</p> <p>One credit - Diversion of resources from landfill - LIKELY Divert demolition and construction waste from landfill to meet the team's BREEAM targets. Refer to credit link for Table 10.2.</p>	<p>1. A copy of a pre-demolition audit. A copy of the compliant Resource Management Plan containing the appropriate bench marks, commitments and procedures and, where relevant a copy of the pre-demolition OR 2. A copy of relevant specification clauses that require the principal contractor to produce a RMP in line with requirements; contains the detailed requirements with respect to resource efficiency benchmarks and targets and procedures to be included in the RMP. 3. A consistent record of all demolition and construction waste generated, along with diversion / recycling rates. Include details of waste management and recycling facility.</p>	3	2.40%	0	0.00%	0	0.00%	Requirements are to be included as part of the contractor requirements documentation, to provided within the tender package.
WST 02	Use of recycled and sustainably sourced aggregates	N/A		<p>Pre-Requirement If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Wst 01 Construction waste management: Criterion 1 and Wst 01 Construction waste management: Criterion 2 .</p> <p>One Credit - Recycled Aggregates - NOT TARGETED 1. Identify all aggregate uses and types on the project. Refer to credit link for Tables 10.5 and 10.6. 2. Determine the quantity in tonnes for each identified use, aggregate type and source region. Calculate distance by transport type. 3. Complete BREEAM Wst02 Calculator to calculate the Project Sustainable Aggregate points.</p>	<p>1. Completed copy of BREEAM Wst02 Calculator 2. Documentary evidence supporting the data used to complete the Calculator tool. 3. Formal written confirmation from the design team or main contractor of the source of recycled/secondary aggregates and that the required amount and quality can be obtained from this source. 4. A copy of the relevant specification or contract clause confirming recycled and secondary aggregate use requirements for the project. OR Calculation confirming the amount of recycled or secondary aggregate to be used.</p>	0	0.00%	0	0.00%	0	0.00%	
WST 03	Operational waste	N/A	Architect	<p>One Credit - Operational Waste - LIKELY 1. Centralised waste storage area should be present on site for the segregation and storage of recyclables. 2. The space must be clearly labelled to assist with segregation, accessible to building occupants or facilities operators, and of a capacity appropriate to the building's size and number of occupants. 3. Total area (m2) of the storage area should be an appropriate size to meet BREEAM criteria.</p>	<p>1. Marked up building site plan confirming the location and size of the dedicated recyclable storage area and the storage area for general waste, as well as other waste facilities present. 2. Project team meeting minutes / letter confirming likely building waste streams and indicative volumes.</p>	1	0.80%	0	0.00%	0	0.00%	
WST 05	Adaptation to climate change	RIBA Stage 2-4	Architect, Civil Engineer, Mech. Eng	<p>One Credit - Resilience of Structure, Fabric, Building Services and Renewables Installation - NOT TARGETED 1. Conduct a climate change adaptation strategy appraisal using a systematic risk assessment. 2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during Concept Design. 3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.</p>	<p>Provide a copy of the climate change adaptation strategy appraisal. Design drawings / specifications showing specific measures in place at Technical Design.</p>	0	0.00%	0	0.00%	0	0.00%	
WST 06	Design for disassembly and adaptability	RIBA Stage 2 RIBA Stage 4	Architect	<p>One Credit - Design for Disassembly and Functional Adaptability, Recommendation - POSSIBLE 1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design. 2. Develop recommendations or solutions during or prior to Concept Design.</p> <p>One Credit - Disassembly and Functional Adaptability, Implementation - POSSIBLE 1. During Technical Design, show how recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. 2. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.</p>	<p>Design for Disassembly and Functional Adaptability, Recommendation Disassembly and functional adaptability study, implementation plan report, building adaptability and disassembly guide.</p> <p>Disassembly and Functional Adaptability, Implementation 1. Evidence showing how these functional adaptation measures have been implemented into the design of the building, e.g. drawings or written narratives. 2. A building adaptability and disassembly guide</p>	0	0.00%	2	1.60%	0	0.00%	
Total Section Score:						4	3.20%	2	1.60%	0	0.00%	

Summary of BREEAM requirements: Land Use and Ecology

Land Use and Ecology												
Issue ref.	Credit title	RIBA Stage	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
LE 01	Site selection	N/A	Architect	<p>One Credit - Previously Occupied Land - LIKELY At least 75% of the proposed development's footprint is on an area of land which has previously been occupied by industrial, commercial or domestic buildings or fixed surface infrastructure.</p> <p>One Credit - Contaminated Land - NOT TARGETED 1. A site investigation, risk assessment and appraisal have deemed land within the site to be affected by contamination. 2. The site investigation, risk assessment and appraisal have identified the degree and source of the contamination, as well as options for remediation. 3. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional.</p>	<p>Previously Occupied Land 1. Existing site plan and/or site photographs confirming previous land use and area (m²) of that use. 2. A proposed site plan showing the location and footprint of the proposed development and temporary works.</p> <p>Contaminated Land 1. A copy of the site investigation and assessment report. Evidence of remediation works in compliance with the relevant standards. 2. A copy of the remediation strategy and implementation plan.</p>	1	1.46%	0	0.00%	0	0.00%	
LE 02	Identifying and understanding the risks and opportunities for the project	RIBA Stage 1 RIBA Stage 1	Project Team	<p>Prerequisite - Assessment route selection 1. An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist. 2. Compliance is monitored against all relevant UK and EU or international legislation.</p> <p>Route 1 (One Credit) - LIKELY This route is only appropriate where the level of ecological risk associated with the site is of a level that can be addressed with non-specialist knowledge and publicly available resources and information. This would be assessed by completing the Ecological Risk Evaluation Checklist.</p> <p>Route 2 (Two Credits): 1. A Suitably Qualified Ecologist (SQE) is appointed at a project stage. 2. Prior to the completion of the Preparation and Brief project stage, an appropriate level of survey and evaluation has been carried out to determine the ecological baseline of the site. 3. Data are collated and shared with project team to inform the site preparation, design and construction works. 4. During Concept Design, the project team liaise and collaborate with representative stakeholders to identify the optimal ecological outcome for the site. 5. The ecological outcome for the site is determined by identifying, appraising and selecting specific solutions and measures. 6. The optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team.</p>	<p>Prerequisite Completed copy of Guidance Note 34: BREEAM, CEEQUAL and HQM Ecology Risk Evaluation Checklist.</p> <p>Route 1 1. Completed copy of Guidance Note 34: BREEAM, CEEQUAL and HQM Ecology Risk Evaluation Checklist. 2. Design drawings specifications showing the measures put in place to avoid, protect and where possible, enhance biodiversity on site.</p> <p>Route 2 1. A copy of the Ecological Survey and Evaluation document. 2. A copy of the Ecologist's report confirming the measures put in place to avoid, protect and where possible, enhance biodiversity on site. 3. Design drawings / specifications showing these measures in place.</p>	1	1.46%	0	0.00%	0	0.00%	
LE 03	Managing negative impacts on ecology	RIBA Stage 1 or 2	Project Team	<p>Prerequisite 1. Completed LE02 requirements.</p> <p>One Credit - Planning, Liaison, Implementation and Data - LIKELY 1. Roles and responsibilities for managing negative impacts on the ecology are clearly defined to influence the Preparation and Brief or Concept Design. 2. Identify the potential impact of site preparation and construction works on ecology. 3. The project team, liaising and collaborating with representative stakeholders and, taking into consideration data collated and shared, have selected measures to be implemented during site preparation and construction works.</p> <p>Up to Two Credits - Managing Negative Impacts One Credit - Route 1 - LIKELY Negative impacts from site preparation and construction works have been managed according to the hierarchy and no overall loss of ecological value has occurred.</p> <p>Up to two credits - Route 2: Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net loss of ecological value has occurred OR the loss of ecological value has been minimised.</p>	<p>1. Design drawings including proposed and existing site plan / survey</p> <p>Route 1: Refer to GN35 - BREEAM UK New Construction 2018 Ecology Assessment - Route 1 methodology, for further guidance.</p> <p>Route 2: Guidance Note 40: Ecology Assessment Reporting Template can be referred to and used to collate information and evidence for the assessment.</p>	2	2.92%	0	0.00%	0	0.00%	
LE 04	Change and enhancement of ecological value	RIBA Stage 1 or 2	Project Team	<p>Prerequisite 1. Completed LE03 basic requirements. 2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.</p> <p>One Credit - Change and Enhancement of Ecology - LIKELY Route 1: 1. The project team, liaising and collaborating with representative stakeholders and have implemented locally relevant ecological solutions. Those are based on recommendations from recognised 'local' ecological expertise and specialist input and guidance.</p> <p>One Credit - Liaison, Implementation and Data Collation - NOT TARGETED Route 2: 1. Solutions and measures implemented enhance the ecological value on site, and where this is not feasible, as well as off site within the zone of influence. 2. Data collated are provided to the local environmental records centres nearest to, or relevant for, the site.</p> <p>Up to Three Credits - Change and Enhancement of Ecology - NOT TARGETED Route 2: Credits are awarded based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated accordance to GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2.</p>	<p>1. Design drawings including proposed and existing site plan / survey</p> <p>Route 1: 1. Refer to GN35 - BREEAM UK New Construction 2018 Ecology Assessment - Route 1 methodology, for further guidance.</p> <p>Route 2: 1. Guidance Note 40: Ecology Assessment Reporting Template can be referred to and used to collate information and evidence for the assessment. 2. Calculations according to GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2.</p>	1	1.46%	0	0.00%	0	0.00%	

LE 05	Long term ecology management and maintenance	RIBA Stage 1 or 2	Project Team	<p>Prerequisite - Roles and Responsibilities, Implementation, Statutory Obligations</p> <ol style="list-style-type: none"> The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site. Completed LE03 criteria 2 or 3 Route 1 or 2. For Route 2, at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded. <p>One Credit - Planning, Liaison, Data, Monitoring and Review Management and Maintenance - POSSIBLE</p> <ol style="list-style-type: none"> Monitor and review the effectiveness with which the plans for LE 03 & LE 04 are implemented, as well as review management and maintenance solutions. Monitoring and reporting of the ecological outcomes for site implemented at the design and construction stage, as well as the outcomes from the project. Maintaining the ecological value of the site and its relationship or connection to its zone of influence. Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02). Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04. Include a section on Ecology and Biodiversity in the tenant or building owner information supplied to inform the owner or occupant of local ecological features. <p>One Credit - Landscape and Ecology Management Plan Development - LIKELY</p> <ol style="list-style-type: none"> Landscape and ecology management plan is developed in accordance with BS 42020:2013 Section 11.11 covering as a minimum the first five years after project completion. 	<p>Prerequisite - Roles and Responsibilities, Implementation, Statutory Obligations</p> <p>Letter confirming compliance with UK/EU Standards.</p> <p>Planning, Liaison, Data, Monitoring and Review Management and Maintenance</p> <p>Ecology Report Copy of the tenant or owner information.</p> <p>Landscape and Ecology Management Plan Development</p> <p>The Landscape and Ecology Management Plan</p>	1	1.46%	1	1.46%	0	0.00%	
Total Section Score:						6	8.77%	1	1.46%	0	0.00%	

Summary of BREEAM requirements: Pollution

Pollution											
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
POL 03	Flood and surface water management	Civil Engineer	<p>Prerequisite - LIKELY An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria.</p> <p>Up to Two Credits - Flood Resilience Two Credits - Low Flood Risk - LIKELY A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding for all current and future sources of flooding.</p>	<p>Flood Resilience 1. A copy of the flood map or flood risk assessment confirming the flood zone or annual probability of flooding in the site location. 2. A copy of the flood risk assessment and site plans confirming: the design flood level for the site; the design ground levels for all developed areas of the site; safe access and escape routes. 3. Correspondence from the appropriate statutory body confirming a reduced annual probability of flooding due to flood defences where applicable.</p>							
		Civil Engineer	<p>Two Credits - Surface Water Run-off - TWO CREDITS LIKELY</p> <p>Prerequisite: Surface water run-off design solutions must take account of the specific site requirements and natural or man-made environment of and surrounding the site.</p> <p>One Credit - Surface Water Run-Off, Rate 1. Calculations for drainage measures include an allowance for climate change. 2. Refer to credit link for further detailed explanation of different site requirements. 3. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place.</p> <p>One Credit - Surface Water Run-Off, Rate 1. Flooding of property will not occur in the event of local drainage system failure. 2. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. OR Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge.</p> <p>One Credit - Minimising Watercourse Pollution - POSSIBLE 1. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). 2. In areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.</p>	<p>Surface Water run off credits Consultant's report containing all information necessary to demonstrate compliance including: 1) Type and storage volume (L) of the drainage measures. 2) Total area of hard surfaces (m2) 3) Peak/volume flow rates (l/s) pre and post development for the return periods. 4) Additional allowance for climate change designed into the system. 5) Impact on the building of flooding from local drainage system failure.</p> <p>Minimising Watercourse Pollution 1. Consultant's report detailing the design specifications, calculations and drawings to support the 5mm rainfall discharge criteria. Design drawings and/or relevant section/clauses of the building specification or contract indicating: 1) High and low risk areas of the site 2) Specification of SuDS, source control system soil/petrol interceptors and shut off valves as appropriate. 2. Confirmation is required within the reports confirming that water pollution prevention systems are designed in accordance with PPG3 and the SuDS manual (where appropriate).</p>	4	4.00%	1	1.00%	0	0.00%	
POL 04	Reduction of night time light pollution	Electrical Engineer	<p>One credit - LIKELY 1. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2020. 2. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. 3. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes.</p>	<p>1. Design drawings, along with the relevant section / clauses of the specification or alternatively the external lighting design data / calculations. 2. M&E engineer to provide indicative examples of where and how the external lighting design strategy complies with the assessment criteria.</p>	1	1.00%	0	0.00%	0	0.00%	Requirements were achieved as part of the base build and so expected to be achieved as part of the Retail Façade project.
Total Section Score:					5	5.00%	1	1.00%	0	0.00%	

Summary of BREEAM requirements: Innovation

Innovation											
Issue ref.	Credit title	Resp. Party	Key actions	Evidence Required	Likely credits	Impact on final score (Likely)	Possible credits	Impact on final score (Possible)	Secured Credits	Impact on final score (Secured)	Notes and comments
Innovation	Innovation	Principal Contractor	Man 03 Responsible Construction Practices - LIKELY Achieve all items in Table 4.1 on page 51 of the BREEAM 2018 Technical Manual SD5078 1.2.	As defined within existing BREEAM issues. One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an Approved Innovation application form.	1	1.00%	0	0.00%	0	0.00%	
Total Section Score:					1	1.00%	0	0.00%	0	0.00%	

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	21/09/2021	T Lodge	L Aminu	E Gulacsy	Initial Draft
B	28/01/2022	T Lodge	L Aminu	E Gulacsy	Stage 3 Draft

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D. LEED Pre-assessment (Offices)



Google KGX1

LEED Project Report

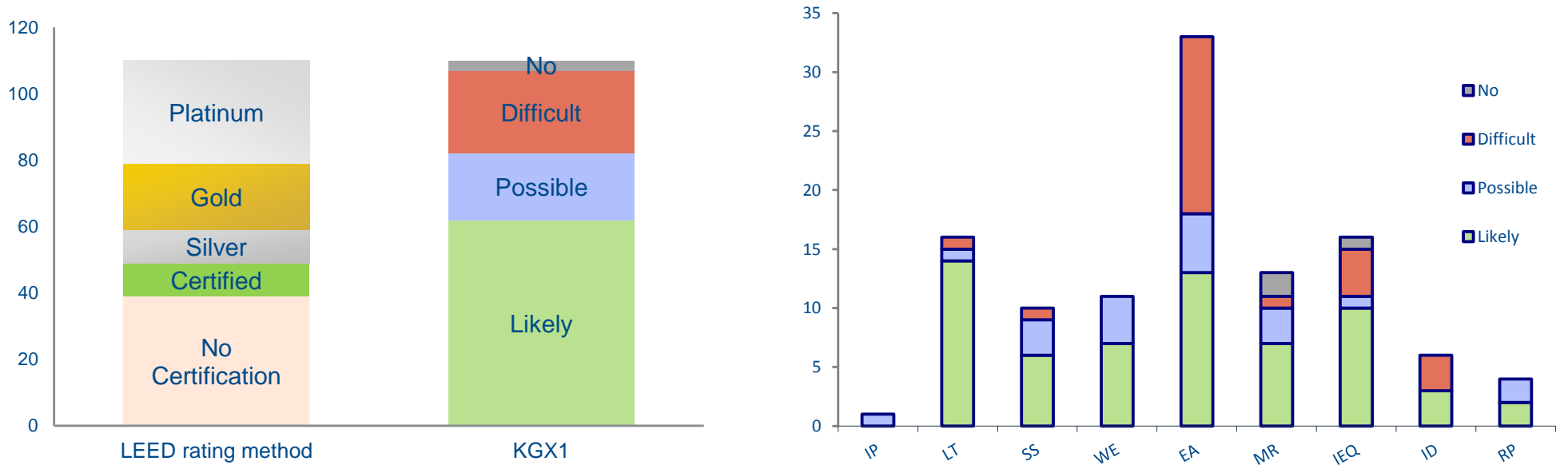


LEED Project Summary

Project title:	Google KGX1
Project description :	LEED Certification
Rating system used :	LEED v4 BD+C
Date of latest issue :	17 January 2017

Current predicted LEED score: 62 points
Current predicted LEED rating: GOLD
Potential LEED rating: PLATINUM

It is Google's aspiration for the project to pursue LEED certification. As such, the target of achieving LEEDv4 Gold has been set for the project requiring compliance to be met with a minimum of 60 points. This report presents a summary of performance for the KGX1 project against the requirements of the LEED rating system. The likelihood of achieving each credit has been aligned with current project design considerations. Please note, there are no planning requirements associated with LEED certification.



Project Team:

	Company	Short	Named individual(s)
Owner:	Google	Client	Andrew Martin
Architect:	HS / BIG / BDP	Arch	ES / RK / JM
Mech Engineer:	Atelier Ten	M.Eng	Younha Rhee
Civil Engineer:	AKT II	C.Eng	David Illingworth
Landscape Architect:	Gillespies	L.Arc	Jaime Macfarlane
Ecologist	TBC	Eco	TBC
Transport Consultant	TBC	Tra	TBC
Electrical Engineer:	BDP Lighting	E.Eng	TBC
Acoustician	Sandy Brown	Acou	Ed Farrer
Commissioning Agent:	FPC	CXA	Dean Francis
Project Manager :	Argent	PM	Michael Morgan
Contractor:	TBC	Cont.	TBC
Energy Modelling:	Atelier Ten	EnMod	Meredith Davey
LEED Energy Modelling	Mott MacDonald	EnModL	Matthew Collin
LEED AP :	Mott MacDonald	LEED	Jessica Binks

Definition of credit likelihood categories:

Likely	Credit is usually easily achieved as a matter of best practice or by virtue of site selection
Possible	No information received yet or technical difficulties are expected
Difficult	Credit can only be achieved at high capital expense or great technical difficulty
No	Credit is not applicable or cannot be achieved by virtue of the project's characteristics

LEED Project Summary

Project title:	Google KGX1
Project description :	LEED Certification
Rating system used :	LEED v4 BD+C
Date of latest issue :	17 January 2017

The following changes have been made since the last issue of this report on 26 September, 2016;

Total points previously reported; 60 **Gold**

Changes to credit likelihood

	Available	Likely	Possible	Difficult	No			
2	2 ←	0	0	0	0	EQc4	Design	Indoor Air Quality Assessment
1	0	0	0	0 →	1	EQc5	Design	Thermal Comfort
1	2	0	0	0	0	Summary of additional points		
1	62	Resulting change in score, equating to LEED Gold rating						

LEED Project Scorecard

Current Predicted Rating: **GOLD**

Potential Rating: **PLATINUM**

(Likely + Possible credits)

17 January 2017

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** >80 points

Credit	Current Credits					Phase	Credit Title	Primary Responsibility	Action by	Status / Comments
	Available	Likely	Possible	Difficult	No					
Integrative process										
IP c 1	1	0	1	0	0	Design	Integrative process	PM	Client	
Location and Transportation										
LT c 1	1	1	0	0	0	Design	Sensitive land protection	Client	Arch	
LT c 2	2	2	0	0	0	Design	High priority site	Client	Arch	
LT c 3	5	5	0	0	0	Design	Surrounding density and diverse uses	Arch	Arch	
LT c 4	5	5	0	0	0	Design	Access to quality transit	Tra	Client	
LT c 5	1	0	1	0	0	Design	Bicycle facilities	Arch	Arch	
LT c 6	1	1	0	0	0	Design	Reduced parking footprint	Client	Arch	
LT c 7	1	0	0	1	0	Design	Green vehicles	Client	Arch	
Sustainable Sites										
SS p 1	Pre-req	0	0	0	0	Construction	Construction activity pollution prevention	Cont.	Cont.	
SS c 1	1	1	0	0	0	Design	Site assessment	Eco	Eco	
SS c 2	2	2	0	0	0	Design	Site development - protect or restore habitat	Eco	L.Arc	
SS c 3	1	1	0	0	0	Design	Open space	L.Arc	Client	
SS c 4	3	0	3	0	0	Design	Rainwater management	C.Eng	N/A	
SS c 5	2	2	0	0	0	Design	Heat island reduction	Arch	LEED	
SS c 6	1	0	0	1	0	Design	Light pollution reduction	E.Eng	LEED	
Water Efficiency										
WE p 1	Pre-req	0	0	0	0	Design	Outdoor water use reduction	L.Arc	L.Arc	
WE p 2	Pre-req	0	0	0	0	Design	Indoor water use reduction	Arch	Arch	
WE p 3	Pre-req	0	0	0	0	Design	Building-level water metering	M.Eng	LEED	
WE c 1	2	0	2	0	0	Design	Outdoor water use reduction	L.Arc	L.Arc	
WE c 2	6	4	2	0	0	Design	Indoor water use reduction	Arch	Arch	
WE c 3	2	2	0	0	0	Design	Cooling tower water use	M.Eng	M.Eng	
WE c 4	1	1	0	0	0	Design	Water metering	M.Eng	M.Eng	
Energy and Atmosphere										
EA p 1	Pre-req	0	0	0	0	Construction	Fundamental commissioning	CXA	Client	
EA p 2	Pre-req	0	0	0	0	Design	Minimum energy performance	M.Eng	LEED	
EA p 3	Pre-req	0	0	0	0	Design	Building-level energy metering	M.Eng	M.Eng	
EA p 4	Pre-req	0	0	0	0	Design	Fundamental refrigerant management	M.Eng	M.Eng	
EA c 1	6	6	0	0	0	Construction	Enhanced commissioning	CXA	CXA	
EA c 2	18	3	3	12	0	Design	Optimize energy performance	EnModL	M.Eng	
EA c 3	1	1	0	0	0	Design	Advanced energy metering	M.Eng	N/A	
EA c 4	2	0	0	2	0	Design	Demand response	Client	M.Eng	
EA c 5	3	0	2	1	0	Design	Renewable energy production	Client	M.Eng	
EA c 6	1	1	0	0	0	Design	Enhanced refrigerant management	M.Eng	M.Eng	
EA c 7	2	2	0	0	0	Design	Green power and carbon offsets	Client	N/A	
Materials and Resources										
MR p 1	Pre-req	0	0	0	0	Design	Storage and collection of recyclables	Arch	Client	
MR p 2	Pre-req	0	0	0	0	Construction	Waste management planning	Cont.	Cont.	
MR c 1	5	0	3	0	2	Construction	Building life-cycle impact reduction	Arch	Arch	
MR c 2	2	2	0	0	0	Construction	BPDO - environmental product declarations	Arch	Arch	
MR c 3	2	1	0	1	0	Construction	BPDO - sourcing of raw materials	Arch	Arch	
MR c 4	2	2	0	0	0	Construction	BPDO - material ingredients	Arch	Arch	
MR c 5	2	2	0	0	0	Construction	Waste management	Cont.	Cont.	
Indoor Environmental Quality										
EQ p 1	Pre-req	0	0	0	0	Design	Minimum IAQ performance	M.Eng	M.Eng	
EQ p 2	Pre-req	0	0	0	0	Design	Environmental tobacco smoke control	Client	Client	
EQ c 1	2	2	0	0	0	Design	Enhanced indoor air quality strategies	M.Eng	M.Eng	
EQ c 2	3	3	0	0	0	Construction	Low-emitting materials	Arch	Arch	
EQ c 3	1	1	0	0	0	Construction	Construction IAQ Management Plan	Cont.	Cont.	
EQ c 4	2	2	0	0	0	Construction	Indoor air quality assessment	Cont.	Cont.	
EQ c 5	1	0	0	0	1	Design	Thermal comfort	M.Eng	M.Eng	
EQ c 6	2	2	0	0	0	Design	Interior lighting	E.Eng	E.Eng	
EQ c 7	3	0	0	3	0	Design	Daylight	Arch	M.Eng	
EQ c 8	1	0	0	1	0	Design	Quality views	Arch	Arch	
EQ c 9	1	0	1	0	0	Design	Acoustic performance	Arch	N/A	
Innovation										
ID c 1	1	1	0	0	0	Design	Innovation in Design: TBC	LEED	LEED	
ID c 1	1	1	0	0	0	Design	Innovation in Design: TBC	Arch	Arch	
ID c 1	1	0	0	1	0	Design	Innovation in Design: TBC	Client	Client	
ID c 1	1	0	0	1	0	Design	Innovation in Design: TBC	LEED	LEED	
ID c 1	1	0	0	1	0	Design	Innovation in Design: TBC	Cont.	LEED	
ID c 2	1	1	0	0	0	Design	LEED® Accredited Professional	LEED	LEED	
Regional Priority										
RP c 1	1	1	0	0	0	Design	Regional Priority: Sensitive Land Protection	LEED	LEED	
RP c 1	1	1	0	0	0	Design	Regional Priority: Protect or Restore Habitat (2 pt thre	LEED	LEED	
RP c 1	1	0	1	0	0	Design	Regional Priority: Rainwater Management (2 pt thresh	LEED	LEED	
RP c 1	1	0	1	0	0	Design	Regional Priority: Optimise Energy Performance (8 pt	LEED	LEED	



Integrative Process

Likely	Possible	Difficult	No	Available
0	1	0	0	1

Integrative Process	Likely	Possible	Difficult	No	Arch	Notes
<p>IPc1</p> <p>Beginning in pre-design and continuing throughout the design phases, identify and use opportunities to achieve synergies across disciplines and building systems described below. Use the analyses to inform the owner's project requirements (OPR), basis of design (BOD), design documents, and construction documents.</p> <p>Energy-Related Systems Perform a preliminary "simple box" energy modelling analysis before the completion of schematic design (RIBA Stage 2) that explores how to reduce energy loads in the building and accomplish related sustainability goals. > Assess at least two potential strategies associated with each of the following: site conditions, massing and orientation, envelope, lighting levels, thermal comfort, process loads, operational parameters. > Document how the above analysis informed design and building form decisions in the project's brief and design including: building site, programme, building geometry, orientation, envelope, services, etc.</p> <p>Water-Related Systems Perform a preliminary water budget analysis before the completion of schematic design (RIBA Stage 2) that explores how to reduce potable water loads in the building and accomplish related sustainability goals. > Assess and estimate the project's potential non-potable water supply sources and water demand volumes, including the following: Indoor water demand, outdoor water demand, process water demand, supply sources. > Document how the above analysis informed design and building form decisions in the project's brief and design including: plumbing systems, sewage, rainwater management, landscaping and irrigation, roofing systems, etc.</p> <p>Deliverables</p> <p>Complete the LEED Integrative Process Worksheet</p>		1			Arch	<p>It is thought that many of the criteria associated with this credit have been undertaken throughout the preliminary stages of the project, as A10 have produced a number of reports and studies relating to solar shading, vacuum drainage and preliminary energy modelling. MM to review this in detail and advise whether compliance is feasible or whether additional work is required.</p>



Location and Transportation

Likely	Possible	Difficult	No	Available
14	1	1	0	16

Sensitive Land Protection		1				Arch	1
LTc1	<p>Locate the development footprint on land that has been previously developed or that does not meet the following criteria for sensitive land:</p> <ul style="list-style-type: none"> - Prime farmland - Floodplains as legally recognized by a local authority - Habitat for threatened or endangered species - Water bodies within 30 meters - Wetlands within 15 meters <p>Projects in Europe may use the Directive 2007/60/EC definition of floods with a medium probability (likely return period \geq 100 years).</p> <p>Projects in Europe may use the Natura 2000 network of protected areas and the European Red List.</p>	<p>There is no change in strategy - a brief narrative describing the previous development of the site, immediately prior to this project, is required to close out the credit. MM to coordinate this.</p>					Notes
	<p>Deliverables</p> <p>Site map(s) showing project boundary, development footprint, any previous development, any sensitive areas, and any minor improvements in required buffers.</p> <p>Explanation of the previous development on the site.</p>						

High Priority Site		2				PM	2
LTc2	<p>Option 1. Historic district (1 point) Locate the project on an infill location in a historic district.</p> <p>Option 2. Priority designation (1 point) Locate the project on one of the following (local equivalent)</p> <ul style="list-style-type: none"> - a site listed by the EPA National Priorities List - a Federal Empowerment Zone site - a Federal Enterprise Community site ...etc. <p>Option 3. Brownfield remediation (2 points) Locate on a brownfield where soil or groundwater contamination has been identified, and where the local authority requires its remediation. Perform remediation to the satisfaction of that authority.</p>	<p>A report detailing the level of site contamination and proposed remediation strategies has been produced. It is noted that some remediation was undertaken as part of Project Queen, and as the land was under the same ownership at that time it should assist with demonstrating that the credit is achievable.</p> <p>Compliance with option 3 is therefore now deemed likely. Argent to provide details of previous studies.</p>					Notes
	<p>Deliverables</p> <p>Vicinity map or other documentation confirming previously developed land within 1/2 mile from site (Option 1) or priority site designation (Option 2)</p> <p>Documentation from authority declaring existence of specific contamination and confirming that remediation has been or will be completed to its satisfaction</p>						

Surrounding Density and Diverse Uses

5

Arch

5

LTC3

Option 1. Surrounding density (2–3 points)

Locate on a site whose surrounding existing density within a ¼-mile radius of the project boundary meets the LEED requirements.
AND/OR

Option 2. Diverse uses (1–2 points)

Construct or renovate a building or a space within a building such that the building’s main entrance is within a ½-mile walking distance of the main entrance of four to seven (1 point) or eight or more (2 points) existing and publicly available diverse uses.

There is currently no change in strategy.

Option 1: 3 points likely

It should not be difficult for the project to meet the requirements for combined density of 8,035 sqm per hectare of buildable land.

Option 2: 2 points likely

Uses within 1/2 mile of the project include:

Supermarket, grocery store, convenience store, pharmacy, bank, restaurant, school, post office, fire station, public park, commercial office.

Notes

Deliverables

Area plan or map showing project site and location of existing residential and non-residential buildings within ¼-mile radius (Option 1).

Description of the previous development on the site (Option 1).

Area plan or map showing project site, location and type of each use, and walking routes (Option 2).

Access to Quality Transit

5

Arch

5

LTC4

Locate any functional entry of the project within a ¼-mile walking distance of existing or planned bus, streetcar, or informal transit stops, or within a ½-mile walking distance of existing or planned bus rapid transit stops, light or heavy rail stations, commuter rail stations or ferry terminals.
Calculate the total number of trips for all services combined.

Up to 5 points are awarded based on the number of daily trips:

Weekday trips	Weekend trips	Points
72	40	1
144	108	3
360	216	5

There is currently no change to the proposed strategy. Due to its location near to 2 train stations and busy underground hubs, the project should be able to earn all available credits.

To document compliance, site plans and maps demonstrating pedestrian routes to the transport hubs are required. Train and bus schedules will also be required to allow the credit form to be completed.

Notes

Deliverables

Map showing project, project boundary, transit stop locations, and walking routes and distances to those stops.

Timetables or other service-level documentation.

Map showing attendance boundary.

Bicycle Facilities

1

Arch

1

LTC5

Bicycle network

Design or locate the project such that a functional entry and/or bicycle storage is within a 180-meter walking distance or bicycling distance from a bicycle network that connects to at least one of the following:

- 10 diverse uses
- a bus stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

The proposed occupancy of the project space has not changed since the previous iteration of this report;

- 4500 Googlers max desks
- 500 not desk-based
- 2000 Googler ground visitors
- 1000 visitor upper floors
- 24/7 occupancy

The LEED requirement should be between 180-200 cycle spaces, but it is believed that the local planning requirements are more stringent than LEED and so compliance with this aspect of the credit should not be an issue.

Bicycle storage and shower rooms

Provide short-term bicycle storage for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building.

Provide long-term bicycle storage for at least 5% of all regular building occupants, but no fewer than four storage spaces per building.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

Short-term bicycle storage must be within 30 meters walking distance of any main entrance. Long-term bicycle storage must be within 30 meters walking distance of any functional entry.

It is the requirement for the bicycle network which may be difficult to meet. MM have reviewed the existing and planned networks, and it is the project location which may make it difficult to document as there doesn't appear to be an existing network within 180m of a functional entry of the building. Given the pedestrianised nature of the surrounding area this may be difficult to prove but further consideration will be given to this to determine the viability of compliance.

Notes

Deliverables

Vicinity map showing bicycle network and route and distance along network to eligible destination(s)

Site plan showing bicycle storage locations. Include walking route and bicycling route to school boundary for school projects.

Calculations for storage and shower facilities

Reduced Parking Footprint

1

Arch

1

LTC6

Do not exceed the minimum local code requirements for parking capacity.
AND
Provide parking capacity that is a percentage reduction below the base ratios recommended by the Parking Consultants Council, as shown in the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4.

Case 2. Dense and/or transit-served location

Projects earning 1 or more points under either LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit must achieve a **40%** reduction from the base ratios.

AND

Provide preferred parking for carpools for 5% of the total parking spaces after reductions are made from the base ratios.

Deliverables

Site plan indicating parking areas and preferred parking spaces.

Calculations demonstrating threshold achievement.

Drawings or photographs of signage or pavement markings indicating reserved status of preferred parking areas.

The proposed parking strategy remains the same - there will be no parking provided as part of the development, aside from some disabled spaces. Based on this approach, the project will be able to demonstrate compliance with this credit by default.

Notes

Green vehicles

1

Arch

1

LTC7

Designate 5% of all parking spaces used by the project as preferred parking for green vehicles. Green vehicles are defined as those meeting the Euro 6 limit values or achieving a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

In addition to preferred parking for green vehicles, meet one of the following two options for alternative-fuel fuelling stations:

Option 1. Electric vehicle charging

Install electrical vehicle supply equipment (EVSE) in 2% of all parking spaces used by the project.

Option 2. Liquid, gas, or battery facilities

Install liquid or gas alternative fuel fuelling facilities or a battery switching station capable of refuelling a number of vehicles per day equal to at least 2% of all parking spaces.

Deliverables

Parking or site plan indicating main building entrance, preferred parking spaces, and alternative-fuel fuelling stations; calculations based on total parking capacity.

For preferred parking spaces and electric vehicle charging spaces, photographs of signage or pavement marking.

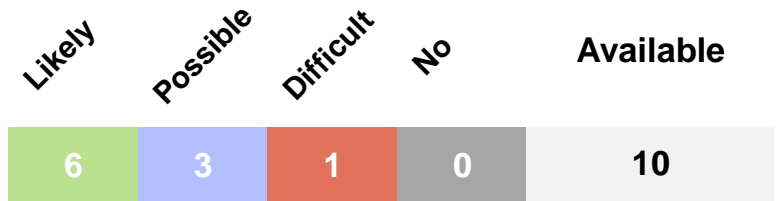
For electrical connectors, manufacturers' product specifications indicating charge level, compliance with relevant standard, and Internet addressability.

The likelihood of this credit has been deemed difficult as it looks unlikely that compliance can be achieved where there is no new parking provided for the project (as per LTC6). We will investigate further whether electric trikes could influence compliance but we will need to raise a CIR - and so, the project must be registered before we can do this.

Notes



Sustainable Sites



Construction Activity Pollution Prevention		6	3	1	0	C.Eng	P
SSp1	<p>Create and implement an Erosion and Sedimentation Control (ESC) Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2012 EPA Construction General Permit OR local erosion and sedimentation control standards and codes, whichever is more stringent. The Plan shall describe the measures implemented to accomplish the following objectives:</p> <ul style="list-style-type: none"> • Erosion and sedimentation control • Stabilization • Pollution prevention 	<p>It is the responsibility of the Civil Engineer to develop a project specific ESC plan. The plan should be based upon local standards and site conditions. The plan should then be passed to the Principal Contractor for further development and implementation during site activities. MM to discuss specific requirements with AKT / Argent ahead of contractor appointment.</p>					Notes
	<p>Deliverables</p> <p>Description of compliance with EPA CGP or comparison of local standards and codes with EPA CGP.</p> <p>Project drawings of erosion and sedimentation control measures and phasing of works etc. (see prerequisite document for detail).</p> <p>Documentation on implementation of the erosion and sedimentation control plan (photos, inspection logs, reports, corrective actions).</p>						

Site Assessment		1				Eco	1
SSc1	<p>Complete and document a site survey or assessment that includes the following information:</p> <ul style="list-style-type: none"> - Topography. Contour mapping, unique topographic features, slope stability risks. - Hydrology. Flood hazard areas, delineated wetlands, lakes, streams, shorelines, rainwater collection and reuse opportunities, TR-55 initial water storage capacity of the site (or local equivalent). - Climate. Solar exposure, heat island effect potential, seasonal sun angles, prevailing winds, monthly precipitation and temperature ranges. - Vegetation. Primary vegetation types, greenfield area, significant tree mapping, threatened or endangered species, unique habitat, invasive plant species. - Soils. Natural Resources Conservation Service soils delineation, U.S. Department of Agriculture prime farmland, healthy soils, previous development, disturbed soils (or local equivalent standards). - Human use. Views, adjacent transportation infrastructure, adjacent properties, construction materials with existing recycle or reuse potential. - Human health effects. Proximity of vulnerable populations, adjacent physical activity opportunities, proximity to major sources of air pollution. <p>The survey or assessment should demonstrate the relationships between the site features and topics listed above and how these features influenced the project design; give the reasons for not addressing any of those topics.</p>	<p>An ecological assessment of the site was completed for Project Queen, and it is also confirmed that an ecologist will be appointed to undertake a similar exercise as part of this project. MM to liaise with ecologist upon appointment to ensure scope of works is in line with specific LEED requirements. Credit is therefore deemed likely.</p>					Notes
	<p>Deliverables</p> <p>Site survey or assessment plan or map.</p> <p>Site assessment worksheet or equivalent narrative.</p>						



Sustainable Sites

Likely	Possible	Difficult	No	Available
6	3	1	0	10

Site Development: Protect or Restore Habitat

2 L.Arc 2

SSc2

Preserve and protect from all development and construction activity 40% of the greenfield area on the site (if such areas exist).
AND

Option 1. On-site restoration (2 points)

Using native or adapted vegetation, restore 30% (including the building footprint) of all portions of the site identified as previously disturbed. Projects that achieve a density of 1.5 floor-area ratio may include vegetated roof surfaces in this calculation if the plants are native or adapted, provide habitat, and promote biodiversity.

Restore all disturbed or compacted soils that will be revegetated within the project's development footprint to meet the following requirements:

- Soils (imported and in situ) must be reused for functions comparable to their original function.
- Imported topsoils or soil blends designed to serve as topsoil may not include the following:
 - . Soils defined as prime farmland
 - . Soils from other greenfield sites, unless by-product of construction.
- Restored soil must meet the LEED criteria of reference soils in categories 1–3 and meet the criteria of either category 4 or 5:
 1. organic matter
 2. compaction
 3. infiltration rates
 4. biological function
 5. chemical characteristics

Project teams may exclude vegetated landscape areas that are constructed to accommodate rainwater infiltration from the vegetation and soils requirements, provided all such rainwater infiltration areas are treated consistently with SS Credit Rainwater Management.

Option 2. Financial support (1 point)

Provide financial support equivalent to at least \$0.40 per square foot (US\$4 per square meter) for the total site area (including the building footprint).

Financial support must be provided to a nationally or locally recognized land trust or conservation organization within the same EPA Level III ecoregion or the project's state (or within 100 miles of the project [160 kilometres] for projects outside the U.S.).

Deliverables

- Provide site plans that highlight the protected or restored site area and list native and adapted plant species.
- Native or adapted vegetation calculations.
- Description of disturbed or compacted soils to be revegetated.
- Greenfield area calculations and description of greenfield area protection.
- Financial support calculations.

Due to the current condition of the site, it is not expected to be difficult to achieve compliance with the requirements of this credit, especially considering the proposed size of the vegetated roof.

The Landscape Architect should consider the planting strategy during the early project stages to ensure that native and adapted species are incorporated where viable.

MM to continue to liaise with L. Architect to discuss specific requirements.

Notes



Sustainable Sites

Likely	Possible	Difficult	No	Available
6	3	1	0	10

✘ Open Space

SSc3

Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space must be vegetated (turf grass does not count as vegetation) or have overhead vegetated canopy.

The outdoor space must be physically accessible and be one or more of the following:

- a pedestrian-oriented paving or turf area with physical site elements that accommodate outdoor social activities;
- a recreation-oriented paving or turf area with physical site elements that encourage physical activity;
- a garden space with a diversity of vegetation types and species that provide opportunities for year-round visual interest;
- a garden space dedicated to community gardens or urban food production;
- preserved or created habitat that meets the criteria of SS Credit Protect or Restore Habitat and also includes elements of human interaction.

For projects that achieve a density of 1.5 floor-area ratio (FAR), and are physically accessible, extensive or intensive vegetated roofs can be used toward the minimum 25% vegetation requirement, and qualifying roof-based physically accessible paving areas can be used toward credit compliance.

Deliverables

Provide area of the vegetated open space provided by the project.
Project site/landscape drawings highlighting the dedicated vegetated open space.

Description of how open space is physically accessible and meets area type criteria.

Open space and vegetated area calculations and floor area ratio

Much of the roof space is to be accessible vegetated roof, and so this should enable the project to demonstrate compliance with this credit.

L.Arc 1

Notes

✎ Rainwater Management

SSc4

Option 1. Percentile of rainfall events

Path 1. 95th percentile (2 points)

In a manner best replicating natural site hydrology processes, manage on site the runoff from the developed site for the 95th percentile of regional or local rainfall events using low-impact development (LID) and green infrastructure.

Path 2. 98th percentile (3 points)

Achieve Path 1 but for the 98th percentile of regional or local rainfall events, using LID and green infrastructure.

Path 3. 85th Percentile - Zero lot line projects only (3 points)

Applies to zero lot line projects in urban areas with a minimum density of 1.5 FAR.

Use daily rainfall data and the methodology in the EPA Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act to determine the 95th percentile amount.

There is no change in strategy in that Option 1 Path 3 is expected to be the most viable approach for this credit.

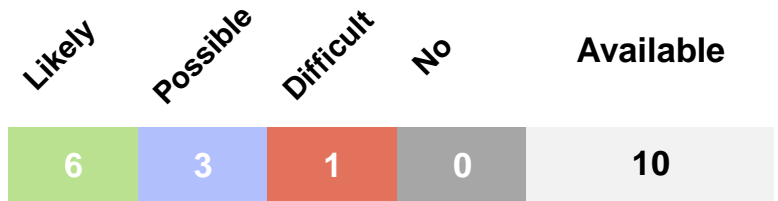
MM have discussed options and strategy with AKT II, A10 and Gillespies. Currently the inclusion of attenuation in the basement is not a viable solution for the project, and so the team are reviewing the attenuation capability of the vegetated roof. Upon project registration, MM will query the site-wide approach with the USGBC. Compliance remains possible at this stage.

C.Eng 3

Notes



Sustainable Sites



Option 2. Natural land cover conditions (3 points)

Manage on site the annual increase in runoff volume from the natural land cover condition to the post developed condition.

Deliverables

Rainfall data and rainfall events calculator or calculations for the chosen percentile storm.

Runoff volume calculations.

Plans, details, or cross sections depicting site conditions and GI or LID strategies, highlighting topography, direction of water flow, and area of site that each facility addresses.

Narrative confirming measures qualify as GI or LID.

Calculations for volume of rainwater managed by GI or LID strategies.

Documents illustrating natural land cover conditions.

✘ Heat Island Reduction

2

Arch

2

SSc5

Option 1. nonroof and roof (2 points)

Meet the following criterion:

Non-roof measures (m2) / 0.5

+ High reflectance roof (m2) / 0.75

+ Vegetated roof (m2) / 0.75

> Total site paving area + Total roof area

Alternatively, an SRI and SR weighted average approach may be used to calculate compliance.

Nonroof measures

- Install plants that provide shade over paving areas within 10 years of planting.

- Install vegetated planters.

- Provide shade with structures covered by energy generation systems.

- Provide shade with architectural devices or structures that have a three-year aged solar reflectance (SR) value of at least 0.28. If three-year aged value information is not available, use materials with an initial SR of at least 0.33 at installation.

- Provide shade with vegetated structures.

- Use paving materials with a three-year aged solar reflectance (SR) value of at least 0.28. If three-year aged value information is not available, use materials with an initial SR of at least 0.33 at installation.

- Use an open-grid pavement system (at least 50% unbound).

High-reflectance roof

Use roofing materials that have an SRI equal to or greater than the values in Table 1. Meet the three-year aged SRI value. If three-year aged value information is not available, use materials that meet the initial SRI value.

Type	Slope	Initial SRI	3-year SRI
Low-sloped roof	≤ 2:12	82	64
Steep-sloped roof	> 2:12	39	32

There is no change to the original strategy for this credit. The extent of the vegetated coverage currently included in the proposed design is likely to enable compliance with this credit.

Notes



Sustainable Sites

Likely	Possible	Difficult	No	Available
6	3	1	0	10

Option 2. parking under cover (1 point)
Place a minimum of 75% of parking spaces under cover. Any roof used to shade or cover parking must (1) have a three-year aged SRI of at least 32 (if three-year aged value information is not available, use materials with an initial SRI of at least 39 at installation), (2) be a vegetated roof, or (3) be covered by energy generation systems.

Deliverables

- Nonroof and roof area calculations.
- Site plan(s) with elements and measurements, including LEED project boundary, building footprint, roof and hardscape area, and area of each roof and nonroof measure.
- Manufacturer's documentation of SRI, SR, and paving permeability.

Light Pollution Reduction

SSc6

Meet uplight and light trespass requirements, using either the backlight-uplight-glare (BUG) method (Option 1) or the calculation method (Option 2). Projects may use different options for uplight and light trespass.

Meet these requirements for all exterior luminaires located inside the project boundary (except those listed under "Exemptions"), based on the following:

- The photometric characteristics of each luminaire when mounted in the same orientation and tilt as specified in the project design.
- The lighting zone of the project property determined by the Illuminating Engineering Society and International Dark Sky Association (IES/IDA) Model Lighting Ordinance (MLO) User Guide.

UPLIGHT

Option 1. BUG rating method

Do not exceed the LEED requirements for luminaire uplight ratings, based on the specific light source installed in the luminaire, as defined in IES TM-15-11, Addendum A.

Option 2. calculation method

Do not exceed the following percentages of total lumens emitted above horizontal: 0% (zone LZ0, LZ1), 1.5% (LZ2), 3% (LZ3), 6% (LZ4).

AND

LIGHT TRESPASS

Option 1. BUG rating method

Do not exceed the LEED requirements for luminaire backlight and glare ratings, based on the specific light source installed in the luminaire, as defined in IES TM-15-11, Addendum A.

Option 2. calculation method

Do not exceed the following vertical illuminances at the lighting boundary. 0.5 lux (LZ0, LZ1), 1 lux (LZ2), 2 lux (LZ3), 6 lux (LZ4).

Vertical illuminances must be calculated on vertical planes running parallel to the lighting boundary, with the normal to each plane oriented toward the property and perpendicular to the lighting boundary, extending from grade level to 10 meters above the height of the highest luminaire.

		1		E.Eng	1
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BDP identify that there will be areas of uplighting on the site, but the soffit will likely deflect much of this light and so compliance with this aspect of the credit will not be impacted. However, the retail space will likely be illuminated at night and there may be an issue with the spill from interior lighting. MM and BDP will investigate the viability of this credit further as the design progresses.

Notes

M

MOTT
MACDONALD

M

Google KGX1



Sustainable Sites

Likely	Possible	Difficult	No	Available
6	3	1	0	10

Deliverables

Site lighting plan with boundaries, elements, location of fixtures, and applicable measurements.

Luminaire schedule showing uplight ratings (Uplight Option 1)

Projects with internally illuminated exterior signage only: provide maximum luminance data.

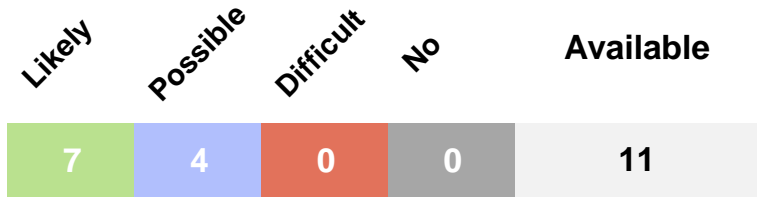
Luminaire schedule showing backlight and glare ratings and mounting heights (Trespass Option 1).

Calculations for lumens per luminaire and lumens emitted above horizontal (Uplight Option 2).

Greatest vertical illuminance value for each vertical calculation plane at lighting boundary (Trespass Option 2).



Water Efficiency



Outdoor Water Use Reduction

WEp1

Reduce outdoor water use through one of the following options. Nonvegetated surfaces, such as permeable or impermeable pavement, should be excluded from landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion.

Option 1. No irrigation required

Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.

Option 2. Reduced irrigation

Reduce the project's landscape water requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions must be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

Landscape architect to advise regarding the project's approach with regards to irrigation for the vegetated roof. Although the inclusion of rainwater harvesting will help reduce potable water demand in line with Option 2 of this credit, strong consideration should be given to the specification of plant species as this will impact compliance.
MM, AKT II and Gillespies to continue discussions as design progresses.

Notes

L.Arc

P

Deliverables

- Site plan showing vegetated areas (Option 1).
- Narrative for plant species and water requirements (Option 1).
- Site plan showing location and size of landscape zones (Option 2).
- Water Budget Tool report (Option 2).

Indoor Water Use Reduction

WEp2

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building.

Appliances, equipment, and processes within the project scope must meet the LEED requirements and standards.

Preliminary calculations have been done, showing performance of different options being considered. All exceed the pre-requisite.

Notes

Arch

P

- Product cutsheets, manufacturers' information.
- Indoor water use calculator.

Building-Level Water Metering

WEp3

Install permanent water meters that measure the total potable water use for the building and associated grounds. Meter data must be compiled into monthly and annual summaries; meter readings can be manual or automated.

Commit to sharing with USGBC the resulting whole-project water usage data for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first.

There has been no change to the proposed strategy - a comprehensive metering strategy will be implemented for the development. MM and A10 will discuss in further detail as the project design progresses.

Notes

M.Eng

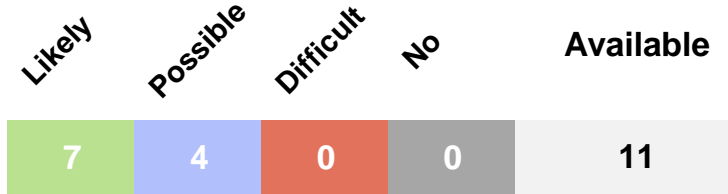
P

Deliverables

- Meter declaration.
- Sharing commitment.



Water Efficiency



WEC1	Outdoor Water Use Reduction	7	2	0	0	L.Arc	2	Notes						
	<p>Reduce outdoor water use through one of the following options. Nonvegetated surfaces, such as permeable or impermeable pavement, should be excluded from landscape area calculations. Athletic fields and playgrounds (if vegetated) and food gardens may be included or excluded at the project team's discretion.</p> <p>Option 1. No irrigation required (2 points) Show that the landscape does not require a permanent irrigation system beyond a maximum two-year establishment period.</p> <p>Option 2. Reduced irrigation (1-2 points) Reduce the project's landscape water requirement (LWR) by at least 50% from the calculated baseline for the site's peak watering month. Reductions must first be achieved through plant species selection and irrigation system efficiency as calculated in the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.</p> <p>Additional reductions beyond 30% may be achieved using any combination of efficiency, alternative water sources, and smart scheduling technologies.</p> <table border="1"> <thead> <tr> <th>Percentage reduction</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>50%</td> <td>1</td> </tr> <tr> <td>100%</td> <td>2</td> </tr> </tbody> </table> <p>Deliverables See WEp1</p>	Percentage reduction	Points	50%	1	100%	2							<p>Landscape architect to advise as to the project's approach with regards to irrigation for the vegetated roof. Although the inclusion of rainwater harvesting will help reduce potable water demand in line with Option 2 of this credit, strong consideration should be given to the specification of plant species as this will impact compliance.</p> <p>There is a current design proposal to include an internal irrigation system, however we confirm that this is not applicable to LEED. There is the potential that this could be considered as part of an innovation in design - MM to review further.</p> <p>Compliance remains possible until further investigation is undertaken.</p>
Percentage reduction	Points													
50%	1													
100%	2													

WEC2	Indoor Water Use Reduction	4	2	0	0	M.Eng	6	Notes														
	<p>Employ strategies that in aggregate use less water than the water use baseline calculated for the building (not including irrigation). The minimum water savings percentage for each point threshold is as follows:</p> <table border="1"> <thead> <tr> <th>Percentage Reduction</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>25%</td> <td>1</td> </tr> <tr> <td>30%</td> <td>2</td> </tr> <tr> <td>35%</td> <td>3</td> </tr> <tr> <td>40%</td> <td>4</td> </tr> <tr> <td>45%</td> <td>5</td> </tr> <tr> <td>50%</td> <td>6 (exc. school, retail, hospitality, health)</td> </tr> </tbody> </table> <p>AND (Schools, Retail, Hospitality and Healthcare ONLY)</p> <p>Appliance and process water Install equipment within the project scope that meets the LEED minimum requirements. All applicable equipment must meet the standard.</p> <p>Schools, Retail, and Healthcare projects can earn a second point for meeting the requirements.</p> <p>Deliverables See WEp2</p>	Percentage Reduction	Points	25%	1	30%	2	35%	3	40%	4	45%	5	50%	6 (exc. school, retail, hospitality, health)							<p>It is confirmed that vacuum drainage is no longer being included within the project design. A10 are currently reviewing options, such as greywater re-use.</p> <p>MM have provided some calculations to show the performance of various options available for the project - project team to review. Four points remains a likely target for the time-being.</p>
Percentage Reduction	Points																					
25%	1																					
30%	2																					
35%	3																					
40%	4																					
45%	5																					
50%	6 (exc. school, retail, hospitality, health)																					



Water Efficiency

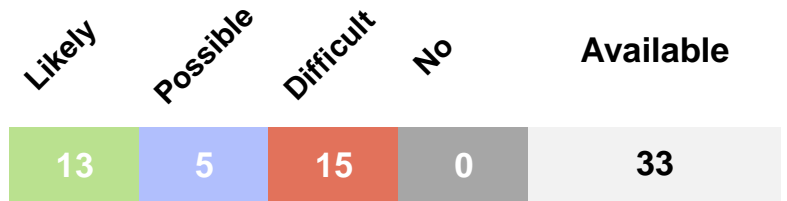
Likely	Possible	Difficult	No	Available
7	4	0	0	11

Cooling Tower Water Use		2	Arch	2											
WEC3	<p>For cooling towers and evaporative condensers, conduct a one-time potable water analysis, in order to optimize cooling tower cycles. Measure at least the following five control parameters:</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Maximum level</th> </tr> </thead> <tbody> <tr> <td>Ca (as CaCO₃)</td> <td>1,000 ppm</td> </tr> <tr> <td>Total alkalinity</td> <td>1,000 ppm</td> </tr> <tr> <td>SiO₂</td> <td>100 ppm</td> </tr> <tr> <td>Cl-</td> <td>250 ppm</td> </tr> <tr> <td>Conductivity</td> <td>2,000 µS/cm</td> </tr> </tbody> </table> <p>Calculate the number of cooling tower cycles by dividing the maximum allowed concentration level of each parameter by the actual concentration level of each parameter found in the potable makeup water. Limit cooling tower cycles to avoid exceeding maximum values for any of these parameters.</p> <p>1 point: Maximum number of cycles achieved without exceeding any filtration levels or affecting operation of condenser water system (up to maximum of 10 cycles).</p> <p>2 points: Achieve a minimum 10 cycles by increasing the level of treatment in condenser or make-up water OR Achieve the number of cycles for 1 point and use a minimum 20% recycled nonpotable water</p> <p>Deliverables</p> <ul style="list-style-type: none"> Potable water analysis results and narrative. Cycles of concentration calculations Nonpotable water calculations (2 points) Water treatment calculations (2 points) 	Parameter	Maximum level	Ca (as CaCO ₃)	1,000 ppm	Total alkalinity	1,000 ppm	SiO ₂	100 ppm	Cl-	250 ppm	Conductivity	2,000 µS/cm	<p>The design team confirm that cooling towers will be used in the project.</p> <p>A10 have been in touch with manufacturers - and it is concluded that bleed water re-use is not a viable approach. However, it is possible to include within the specification that the water treatment levels need to achieve LEED compliance.</p> <p>Based on this, compliance with this credit is now deemed likely. MM and A10 to liaise further with manufacturers and will advise on the documentation required for LEED.</p>	Notes
	Parameter	Maximum level													
Ca (as CaCO ₃)	1,000 ppm														
Total alkalinity	1,000 ppm														
SiO ₂	100 ppm														
Cl-	250 ppm														
Conductivity	2,000 µS/cm														

Water Metering		1	M.Eng	1
WEC4	<p>Install permanent water meters for two or more of the following water subsystems, as applicable to the project:</p> <ul style="list-style-type: none"> - Irrigation. Meter water systems serving at least 80% of the irrigated landscaped area. - Indoor plumbing fixtures and fittings. Meter water systems serving at least 80% of the indoor fixtures and fitting described in WE Prerequisite Indoor Water Use Reduction, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds. - Domestic hot water. Meter water use of at least 80% of the installed domestic hot water heating capacity. - Boiler with aggregate projected annual water use of 378 500 litres or 150 kW. - Reclaimed water. Meter reclaimed water, regardless of rate. - Other process water. Meter at least 80% of expected daily water consumption for process end uses. <p>Deliverables</p> <ul style="list-style-type: none"> Water metering strategy narrative. 	<p>As noted in WEp3 there has been no change in strategy. A comprehensive water metering strategy will be implemented within the project. Compliance therefore remains likely - MM to discuss specific requirements with A10 to ensure criteria are met within the design documentation.</p>	Notes	



Energy and Atmosphere



✘ Fundamental Commissioning and Verification

Likely Possible Difficult No Available CXA P

EAp1

Commissioning Process Scope

Complete the following commissioning (Cx) process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies, in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1–2007 for HVAC&R Systems, as they relate to energy, water, indoor environmental quality, and durability.

- Develop the OPR.
- Develop a BOD

The commissioning authority (cxa) must do the following:

- Review the OPR, BOD, and project design.
- Develop and implement a Cx plan.
- Confirm incorporation of Cx requirements into the construction documents.
- Develop construction checklists.
- Develop a system test procedure.
- Verify system test execution.
- Maintain an issues and benefits log throughout the Cx process.
- Prepare a final Cx process report.
- Document all findings and recommendations and report directly to the owner throughout the process.

Commissioning Authority

By the end of the design development phase, engage a commissioning authority with the following qualifications:

- The CxA must have documented commissioning process experience on at least two building projects.
- The CxA may be a qualified employee of the owner, an independent consultant, or an employee of the design or construction firm who is not part of the project’s design or construction team, or a disinterested subcontractor of the design or construction team.
- For projects smaller than 1 860 square meters, the CxA may be a qualified member of the design or construction team.

In all cases, the CxA must report his or her findings directly to the owner.

Current Facilities Requirements and Operations and Maintenance Plan

Prepare and maintain a current facilities requirements and operations and maintenance plan that contains the information necessary to operate the building efficiently. The plan must include the following:

- sequence of operations for the building
- building occupancy schedule
- equipment run-time schedules
- set points for all HVAC equipment
- set lighting levels throughout the building
- minimum outside air requirements
- seasonal, weekly, daily set point changes
- systems narrative describing the M&E systems and equipment
- preventive maintenance plan
- commissioning program

Deliverables

Facility Performance Consulting (FPC) have been appointed as the project Commissioning Authority (CxA).
MM and FPC to discuss specific requirements to ensure all LEED criteria are being considered.

Notes



Energy and Atmosphere

Likely	Possible	Difficult	No	Available
13	5	15	0	33

- CxA previous experience
- Confirmation of OPR and BOD contents.
- List of systems to be commissioned.
- Verification of CxA activities and reviews.
- Cx plan.
- Documentation of testing and verification.
- CFR, O&M plan.
- Cx report.

Minimum Energy Performance M.Eng P

EAp2 Notes

Option 1. Whole Building Energy Simulation

Demonstrate a 5% improvement in the proposed building performance rating for new buildings, or a 3% for major renovations, or 2% for core and shell, compared with the baseline building performance rating. Calculate the baseline building performance rating according to the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata) using a computer simulation model for the whole building project.

The Part L calculation has been revised since the last issue and the building is performing better than initially expected. However, it is difficult to relate a Part L calculation to ASHRAE 90.1. MM are awaiting for the facade re-design to be complete before finalising the development of the preliminary ASHRAE model, and will advise on the results accordingly. The likelihood of credits for LEED have therefore not changed at this stage, and we still expect that the performance will be sufficient to meet this pre-requisite.

Deliverables

- Input-output reports from modelling software.
- Energy consumption / demand for end use and fuel type.

Building-Level Energy Metering M.Eng P

EAp3 Notes

Install new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc.). Utility-owned meters capable of aggregating building-level resource use are acceptable.

There has been no change to the initial strategy. There is a comprehensive metering strategy proposed for the building, with clear guidance outlined in the Google Project Requirements (GPR). Compliance with this pre-requisite is therefore anticipated. MM to liaise with A10 to ensure all requirements have been captured in the design documentation.

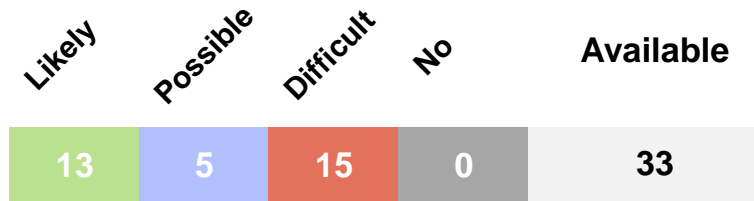
Commit to sharing with USGBC the resulting energy consumption data and electrical demand data (if metered) for a five-year period beginning on the date the project accepts LEED certification or typical occupancy, whichever comes first. At a minimum, energy consumption must be tracked at one-month intervals.

Deliverables

- Confirmation of permanently installed meters.
- Letter of commitment.
- Confirmation of data sharing source.



Energy and Atmosphere



Fundamental Refrigerant Management					M.Eng	P
EAp4	<p>Zero use of chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air conditioning and refrigeration (HVAC&R) systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion. Phase-out plans extending beyond the project completion date will be considered on their merits.</p>	<p>The use of CFC-based refrigerants is banned in the UK, and so compliance with this pre-requisite will be achieved by default. A10 and Sefton Horn Winch (catering consultant) to provide schedule of equipment.</p>		Notes		
	<p>Deliverables</p> <ul style="list-style-type: none"> Equipment type. Refrigerant type. Confirmation that no new or existing equipment contains CFCs. CFC conversion or replacement plan (if phase-out required). Refrigerant leakage rate, quantity (if phase-out required). Phase-out completion date (if phase-out required). 					

Enhanced Commissioning					CXA	6
EAc1	<p>Implement, or have in place a contract to implement, the following commissioning process activities in addition to those required under EA Prerequisite Fundamental Commissioning and Verification.</p> <p>Commissioning authority</p> <ul style="list-style-type: none"> - The CxA must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from early design phase through at least 10 months of occupancy; - The CxA may be a qualified employee of the owner, an independent consultant, or a disinterested subcontractor of the design team. <p>Option 1. Enhanced systems commissioning (3-4 points)</p> <p><u>Path 1: Enhanced commissioning (3 points)</u></p> <p>The commissioning authority must do the following:</p> <ul style="list-style-type: none"> - Review contractor submittals. - Verify inclusion of systems manual requirements in construction documents. - Verify inclusion of operator and occupant training requirements in construction documents. - Verify systems manual updates and delivery. - Verify operator and occupant training delivery and effectiveness. - Verify seasonal testing. - Review building operations 10 months after substantial completion. - Develop an on-going commissioning plan. - Include all enhanced commissioning tasks in the OPR and BOD. 	<p>As noted under EAp1, Facility Performance Consulting (FPC) have been appointed as Commissioning Authority for the project. Due to timing of their appointment, compliance with these credits are now deemed likely.</p>		Notes		



Energy and Atmosphere

Likely	Possible	Difficult	No	Available
13	5	15	0	33

Path 2: Enhanced and monitoring-based commissioning (4 points)

Achieve Path 1.

AND

Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy- and water-consuming systems.

Include the procedures and measurement points in the Cx plan. Address the following:

- roles and responsibilities
- measurement requirements
- points to be tracked, frequency and duration for trend monitoring
- limits of acceptable values for tracked points and metered values
- elements used to evaluate performance
- action plan for identifying and correcting operational errors
- training to prevent errors
- planning for repairs needed to maintain performance

frequency of analysis in the first year of occupancy (at least quarterly)

AND/OR

Option 2. Envelope commissioning (2 points)

Commissioning authority must complete the following:

- Review contractor submittals.
- Verify inclusion of systems manual requirements in construction documents.
- Verify inclusion of operator and occupant training requirements in construction documents.
- Verify systems manual updates and delivery.
- Verify operator and occupant training delivery and effectiveness.
- Verify seasonal testing.
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan.

Deliverables

List of all tasks completed as part of Cx activities.

Training outline and participation list.

Confirmation of systems manual delivery.

Ongoing Cx plan.

Inclusion of monitoring and tracking in Cx plan.

Inclusion of envelope in Cx plan.



Energy and Atmosphere

Likely	Possible	Difficult	No	Available
13	5	15	0	33

EAC2

Option 1. Whole Building Energy Simulation (1–18 points)

Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010 with errata using a computer simulation model for the whole building project. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Core & shell	Points
6%	3%	1
8%	5%	2
10%	7%	3
12%	9%	4
14%	11%	5
etc.		

Option 2. Prescriptive compliance: ASHRAE Advanced Energy Design Guide (1–6 points)

Implement and document compliance with the applicable recommendations and standards in Chapter 4, Design Strategies and Recommendations by Climate Zone, for the appropriate ASHRAE 50% Advanced Energy Design Guide and climate zone. For projects outside the U.S., consult ASHRAE/ASHRAE/IESNA Standard 90.1–2010, Appendixes B and D, to determine the appropriate climate zone.

Deliverables

Please provide a narrative highlighting energy saving measures incorporated in the building design focusing on building envelope, mechanical, lighting, hot water, and all energy efficiency measures. Include a table listing baseline and proposed comparisons of all model variables that are different. Demonstrate how much lower (by a percentage) the design energy cost is as compared to the energy cost budget as defined in ASHRAE/IESNA 90.1-2010. Compare local code requirements to proposed building characteristics if applicable. Provide a completed and signed copy of the Energy Cost Budget (ECB) Compliance Form along with sample output from the energy model summary.

The Part L calculation has been revised since the last issue and the building is performing better than initially expected. However, it is difficult to relate a Part L calculation to ASHRAE 90.1. MM are awaiting for the facade re-design to be complete before finalising the development of the preliminary ASHRAE model, and will advise on the results accordingly. The likelihood of credits for LEED has therefore not changed at this stage, but this will be monitored as the design and modelling exercise progresses. There is potential to uplift the likely score under this issue.

Notes



Energy and Atmosphere

Likely	Possible	Difficult	No	Available
13	5	15	0	33

EAC3

Install advanced energy metering for the following:

- all whole-building energy sources used by the building
- any individual energy end uses that represent 10% or more of the total annual consumption of the building.

The advanced energy metering must have the following characteristics.

- . Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
- . Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.
- . The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
- . The system must be capable of storing all meter data for at least 36 months.

Deliverables

List of all advanced meters to be installed, including type, energy source metered

Manufacturers' datasheets

There has been no change to the proposed strategy. The requirements of this credit form part of the GPR, and in addition to this both Google MTV and Security are very keen to have remote access, which we anticipate will ensure compliance is met. MM to liaise with A10 as the design progresses to ensure documentation is in line with the specific LEED requirements.

Notes

Demand Response

EAC4

Design building and equipment for participation in demand response programs through load shedding or shifting.

Case 1. Demand response program available (2 points)

Participate in an existing demand response (DR) program and complete the required activities.

Case 2. Demand response program not available (1 point)

Provide infrastructure to take advantage of future demand response programs or dynamic, real-time pricing programs and complete the following activities.

- Install interval recording meters with communications and ability for the building automation system to accept an external price or control signal.
- Develop a comprehensive plan for shedding at least 10% of building estimated peak electricity demand. Peak demand is determined under EA Prerequisite Minimum Energy Performance.
- Include the DR processes in the scope of work for the commissioning authority, including participation in at least one full test of the DR plan.
- Contact local utility representatives to discuss participation in future DR programs.

Deliverables

Proof of enrolment in DR program.

Evidence of ability to shed 10% of peak demand.

Confirmation that system is capable of receiving and acting on external signal.

Action plan for meeting reduction requirement during event.

Inclusion of DR in CxA systems testing plan

There has been no change to the initial strategy. Demand response programmes are currently not available in the UK and so only Case 2 is applicable to this project. However, Google have not previously expressed an interest in implementing such a programme during their early discussions with A10.

Notes

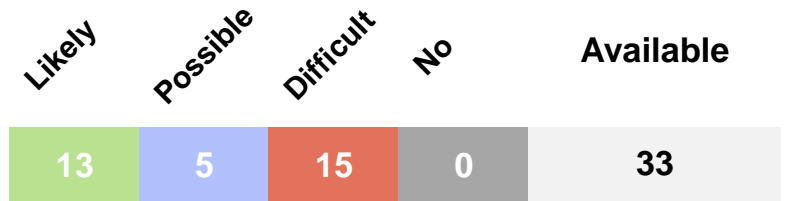
2

M.Eng

2



Energy and Atmosphere



Renewable Energy Production Likely: 13, Possible: 2, Difficult: 1, No: 0, Available: 33

EAC5 M.Eng 3

Use on-site renewable energy systems to offset building energy cost. Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building annual energy cost and using the table below to determine the number of points achieved. Use the building annual energy cost calculated in EA Credit 1 or use the Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS) database to determine the estimated electricity use.

% Renewable Energy	Points (Except CS)	Points (CS)
1%	1	1
3%	-	2
5%	2	3
10%	3	-

Notes: It is now likely that PV panels will be required in order for the project to achieve certain planning obligations. Two of the three points have been deemed possible for the time being, as where the technology is required for S106 and BREEAM, compliance with this may be achieved by default at no additional cost.

Deliverables:
 Renewable system rated capacity.
 Calculations to determine energy generated.
 Equivalent cost of renewable energy produced.

Enhanced Refrigerant Management Likely: 1, Possible: 0, Difficult: 0, No: 0, Available: 1

EAC6 M.Eng 1

Option 1. No refrigerants or low-impact refrigerants (1 point)
 Do not use refrigerants, or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.
 OR
Option 2. Calculation of refrigerant impact (1 point)
 Select refrigerants that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The combination of all new and existing base building and tenant HVAC&R equipment that serve the project must comply with the following formula:
 $LCGWP + LCODP \times 10^5 \leq 13$ (SI Units).

Notes: A10 propose to use HFO1234ze as a replacement for R134A for the chiller refrigerant use, and confirm that they have experience where this allowed a credit to be achieved for LEED. However the chiller efficiency drop must be tested before confirming this approach. MM met SHW to discuss specific requirements - they are in the early stages of liaising with manufacturers and so hope to be able to meet specific LEED compliant systems. Compliance with this credit is therefore thought likely.

Deliverables:
 Equipment type, cooling capacity, quantity and life expectancy.
 Refrigerant schedule with refrigerant type and charge.
 Leakage rate

Green Power and Carbon Offsets Likely: 2, Possible: 0, Difficult: 0, No: 0, Available: 2

Client 2



Energy and Atmosphere

Likely	Possible	Difficult	No	Available
13	5	15	0	33

EAC7

Engage in a contract for qualified resources that have come online since January 1, 2005, for a minimum of five years, to be delivered at least annually. The contract must specify the provision of at least 50% or 100% of the project's energy from green power, carbon offsets, or renewable energy certificates (RECs).

All purchases of green power shall be based on the quantity of energy consumed, not the cost.

Projects in Europe may use the following approved standards in place of Green-e Energy:

- EKOenergy
- Guarantees of Origin (GOs) with additional parameters

For more information, please see <http://www.ekoenergy.org>

Points are awarded based on the percentage of total energy addressed by green power and / or offsets:

- 50%: 1 point
- 100%: 2 points

Deliverables

Annual electricity and nonelectricity energy use calculations.

Calculations showing required REC, green power, or carbon offsets for targeted point threshold.

Purchase contract or letter of commitment showing REC, green power, or carbon offsets for targeted point threshold.

Green-e equivalency documentation, if not Green-e certified.

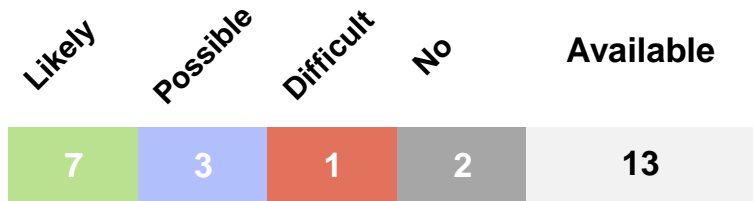
Google MTV have a centralised carbon offset contract in place and are able to provide offsets for entire project spaces. From past experience, compliance with both credits under this issue is therefore feasible.

The total and final floor area, as recorded throughout the LEED submission, is required by the [e]-team to allow the relevant documentation to be produced. MM to liaise with the [e]-team once this is done.

Notes



Materials and Resources

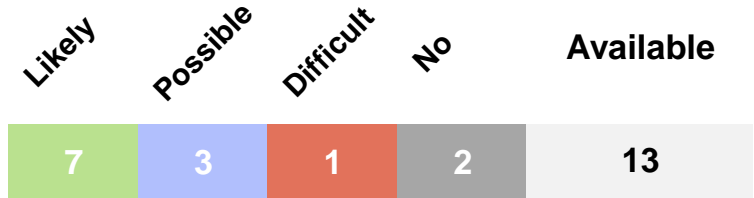


Storage and Collection of Recyclables		Likely	Possible	Difficult	No	Arch	P
MRp1	<p>Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations.</p> <p>Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. Take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.</p>	<p>There has been no change to the strategy for this prerequisite. The requirements are similar to the BREEAM criteria.</p>					Notes
	<p>Deliverables</p> <p>Verification of recycled material types.</p> <p>Narrative describing recycling storage and collection strategies.</p> <p>Floor plans indicating recycling storage and collection areas.</p>						

Construction and Demolition Waste Management Planning		Likely	Possible	Difficult	No	Cont.	P
MRp2	<p>Develop and implement a construction and demolition waste management plan:</p> <ul style="list-style-type: none"> - Establish waste diversion goals for the project by identifying at least five materials (both structural and non-structural) targeted for diversion. approximate a percentage of the overall project waste that these materials represent. - Specify whether materials will be separated or commingled and describe the diversion strategies planned for the project. Describe where the materials will be taken and how the recycling facility will process the material. <p>Provide a final report detailing all major waste streams generated, including disposal and diversion rates.</p> <p>Alternative daily cover (ADC) does not qualify as material diverted from disposal. Land-clearing debris is not considered construction, demolition, or renovation waste that can contribute to waste diversion.</p>	<p>This is currently standard practice in the UK. The Main Contractor will be responsible for producing and implementing this management plan - requirements have been included in the contractor tender documents.</p>					Notes
	<p>Deliverables</p> <p>Construction waste management plan.</p> <p>Total construction waste.</p>						



Materials and Resources



Building Life-Cycle Impact Reduction

MRC1

Demonstrate reduced environmental effects during initial project decision-making by reusing existing building resources or demonstrating a reduction in materials use through life-cycle assessment. Achieve one of the following options.

Option 1. historic building reuse (5 points)

Option 2. renovation of abandoned or blighted building (5 points)
Maintain at least 50%, by surface area, of the existing building structure, enclosure, and interior structural elements for buildings that meet local criteria of abandoned or are considered blight. The building must be renovated to a state of productive occupancy. Up to 25% of the building surface area may be excluded from credit calculation because of deterioration or damage.

Option 3. building and material reuse (2–4 points)

Reuse or salvage building materials from off site or on site as a percentage of the surface area. Include structural elements, enclosure materials, and permanently installed interior elements. Exclude from the calculation window assemblies and any hazardous materials that are remediated as a part of the project.

% surface reused	Points	Points C&S
25%	2	2
50%	3	3
75%	4	5

Option 4. whole-building life-cycle assessment (3 points)

For new construction (buildings or portions of buildings), conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the following six impact categories, one of which must be global warming potential: Global warming potential, ozone depletion, acidification of land and water, eutrophication, formation of tropospheric ozone, resource depletion.

No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building. Use the same life-cycle assessment software tools and data sets to evaluate both the baseline building and the proposed building, and report all listed impact categories. Data sets must be compliant with ISO 14044.

Deliverables

Narrative describing abandoned or blighted status.

Reused elements table and calculations.

Description of LCA assumptions, scope, and analysis process for baseline building and proposed building.

Life-cycle impact assessment summary showing outputs of proposed building with percentage change from baseline building for all impact indicators.

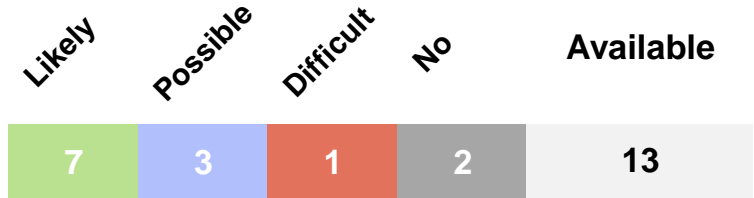
There is no change to the previous strategy. Only option 4 is considered feasible and it requires the appointment of a specialist consultant to undertake a full-life cycle assessment of the project.
Sturgis Carbon Consultants have been appointed to undertake this role and are currently working on the carbon analysis of the project.
The LEED requirements note that an old BRE tool can be used however this is now outdated, and so we are going to put a query to the USGBC to ask whether the approach being taken by Sturgis is acceptable. We will do this as soon as the project is registered with the USGBC.
It is thought that compliance with this will be deemed likely once we have clarification from the USGBC with regards to our approach.

Notes

3 2 Arch 5



Materials and Resources



✘ Building Product Disclosure and Optimization — EPD 2

MRC2

Option 1. environmental product declaration (EPD) (1 point)
Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

- Product-specific declaration (ISO 14044 with cradle to gate scope) are value at 25% of a product for the purpose of the calculation.
- Environmental Product Declarations (ISO 14044, EN 15804)
 - . Industry-wide EPDs are valued at 50% of a product
 - . Product-specific EPDs (Type III) are valued at 100% of a product
- USGBC approved program.

AND/OR

Option 2. Multi-attribute optimization (1 point)
Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project. Products will be valued as below.

- Third party certified products that demonstrate impact reduction below industry average in at least three of the following six impact categories are valued at 100% of their cost for credit achievement calculations: Global warming potential, ozone depletion, acidification of land and water, eutrophication, formation of tropospheric ozone, resource depletion.
- USGBC approved program -- Products that comply with other USGBC approved multi-attribute frameworks.

For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.

It is recognised that products with EPDs will benefit compliance with this credit as well as the Mat01 credit of BREEAM. All materials will be tracked in the 'Materials Tracker' spreadsheet which will help to ensure there are a sufficient number of products with EPDs.
Compliance is therefore still deemed likely.

Notes

Deliverables

Complete MR building product disclosure and optimization calculator.
EPD and LCA reports or compliant summary documents for 100% of products contributing toward credit.



Materials and Resources

Likely	Possible	Difficult	No	Available
7	3	1	2	13

✘ Building Product Disclosure and Optimization—Sourcing of Raw Materials

1		1		Cont.	2
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MRC3

Option 1. raw material source and extraction reporting (1 point)
Use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers with a commitment to responsible sourcing.

- Products sourced from manufacturers with self-declared reports are valued at 50% of a product for credit achievement.
- Third-party verified corporate sustainability reports (CSR) which include environmental impacts of extraction operations and activities associated with the manufacturer’s product and the product’s supply chain, are valued 100% of a product for credit achievement calculation. Acceptable CSR frameworks include the following:
 - . Global Reporting Initiative (GRI) Sustainability Report
 - . OECD Guidelines for Multinational Enterprises
 - . U.N. Global Compact: Communication of Progress
 - . ISO 26000: 2010 Guidance on Social Responsibility
 - . USGBC approved program.

AND/OR

Option 2. leadership extraction practices (1 point)
Use products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.

- Extended producer responsibility (valued at 50%)
- Bio-based materials meeting Sustainable Agriculture Standard (100%)
- Wood products FSC compliant (100%)
- Materials reuse (100%)
- Recycled content (100% for post-consumer, 50% for pre-consumer)
- Other USGBC approved program.

For credit achievement calculation, products sourced (extracted, manufactured, and purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.

There has been no change to the proposed compliance strategy.

Option 1 is deemed difficult to achieve due to uncertainty around the availability of products meeting the LEED requirements. This can be further investigated with the supply chain.

Option 2 gives the option of using materials with a high percentage of recycled content. This option is believed to be achievable in the current UK market.

All materials and manufacturers will be recorded in the materials tracker spreadsheet.

Notes

MR building product disclosure and optimization calculator.
List of products, cost, extraction location, recycled content, etc.
Corporate sustainability reports for 100% of products contributing toward credit.



Materials and Resources

Likely	Possible	Difficult	No	Available
7	3	1	2	13

✘ Building Product Disclosure and Optimization — Material Ingredients	2			Arch	2
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MRC4

Option 1. material ingredient reporting (1 point)
 Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm).
 - Manufacturer Inventory: Publicly available for all ingredients.
 - Health Product Declaration.
 - Cradle to Cradle.
 - Other USGBC approved programs
 AND/OR

Option 2. Material ingredient optimization (1 point)
 Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.
 - GreenScreen v1.2 Benchmark with full list of ingredients to 100ppm.
 . Assessed with GreenScreen List Translator are valued at 100%
 . Full GreenScreen assessment are valued at 150%
 - Cradle to Cradle Certified.
 . Cradle to Cradle v2 Gold: valued at 100%.
 . Cradle to Cradle v2 Platinum: 150%
 . Cradle to Cradle v3 Silver: 100%
 . Cradle to Cradle v3 Gold or Platinum: 150%
 - International Alternative Compliance Path – REACH Optimization.
 . Products that contain no ingredients listed on the REACH Authorization or Candidate list: valued at 100%
 AND/OR

Option 3. Manufacturer Supply Chain Optimization (1 point)
 Use building products for at least 25%, by cost, of the total value of permanently installed products in the project that:
 - Are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99% (by weight) of the ingredients used to make the building product or building material, and
 - Are sourced from product manufacturers with independent third party verification of their supply chain where processes are in place to manage chemical ingredients:
 . communicate and transparently prioritize chemical ingredients.
 . identify, document, and communicate information on health, safety and environmental characteristics.
 . implement measures to manage the health, safety and environmental hazard and risk.
 . optimize health, safety and environmental impacts when designing and improving chemical ingredients.
 . communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain.
 . Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain.

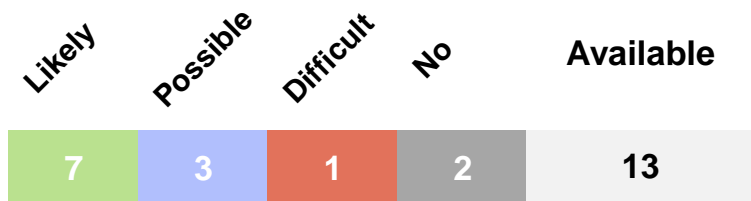
Products meeting Option 3 criteria are valued at 100% of their cost for the purposes of credit achievement calculation.

It is recognised that the Healthy Materials requirements for the project are more stringent than the LEED criteria, meaning that compliance with both credits is deemed likely.

Notes



Materials and Resources



For credit achievement calculation of options 2 and 3, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. For credit achievement calculation, the value of individual products compliant with either option 2 or 3 can be combined to reach the 25% threshold but products compliant with both option 2 and 3 may only be counted once.

Deliverables

- MR building product disclosure and optimization calculator.
- Documentation of chemical inventory.
- Verification of ingredient optimization.
- Documentation of supply chain optimization.

✂ Construction and Demolition Waste Management



MRC7

Option 1. diversion (1-2 points)

Path 1. divert 50% and three material streams (1 point)
 Divert at least 50% of the total construction and demolition material; diverted materials must include at least three material streams.

Path 2. divert 75% and four material streams (2 points)
 Divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams.

Option 2. reduction of total waste material (2 points)
 Do not generate more than 12.2 kilograms of waste per square meter of the building's floor area.

Deliverables

- Track and record total and diverted waste amounts and material streams.
- Documentation of recycling rates for commingled facilities.
- Justification narrative for use of waste-to-energy strategy.
- Documentation of waste-to-energy facilities adhering to relevant EN standards.
- Total waste per area

These credit requirements are aligned with both the GPR and BREEAM criteria, whilst being significantly less demanding than both. Compliance with both of these credits is therefore deemed likely. Specific requirements have been included in the MC tender documents.

Notes



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Minimum Indoor Air Quality Performance

M.Eng P

EQp1

Notes

Ventilation

Mechanically ventilated spaces

Meet the minimum requirements of either one of the following standards:

- ASHRAE 62.1–2010, Sections 4–7.
- EN 15251–2007 (for Indoor environmental input parameters)
- EN 13779–2007 (for performance requirements)

Naturally ventilated spaces

- Determine the minimum outdoor air opening and space configuration requirements using the natural ventilation procedure from ASHRAE Standard 62.1–2010 or a local equivalent, whichever is more stringent.
- Confirm that natural ventilation is an effective strategy based on CIBSE AM10.

Monitoring

Mechanically ventilated spaces

- For VAV systems: provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor air intake flow. This device must measure the minimum outdoor air intake flow with an accuracy of +/-10% of the design minimum outdoor airflow rate, as defined by the ventilation requirements above. An alarm must indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.
- For constant-volume systems, balance outdoor airflow to the design minimum outdoor airflow rate defined by ASHRAE Standard 62.1–2010. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device.

Naturally ventilated spaces

Comply with at least one of the following strategies:

- Provide a direct exhaust airflow measurement device capable of measuring the exhaust airflow. This device must measure the exhaust airflow with an accuracy of +/-10% of the design minimum exhaust airflow rate. An alarm must indicate when airflow values vary by 15% or more from the exhaust airflow setpoint.
- Provide automatic indication devices on all natural ventilation openings intended to meet the minimum opening requirements. An alarm must indicate when any one of the openings is closed during occupied hours.
- Monitor carbon dioxide (CO₂) concentrations within each thermal zone. CO₂ monitors must be between 900 and 1 800 millimetres above the floor and within the thermal zone. CO₂ monitors must have an audible or visual indicator or alert the building automation system if the sensed CO₂ concentration exceeds the setpoint by more than 10%. Calculate appropriate CO₂ set points using the methods in ASHRAE 62.1–2010, Appendix C.

The proposed strategy remains the same as previous discussions. The ventilation requirements are aligned with the GPR and so compliance with this pre-requisite will be achieved. A10 to confirm whether the GPR also includes provision of OAFMDs.

Deliverables

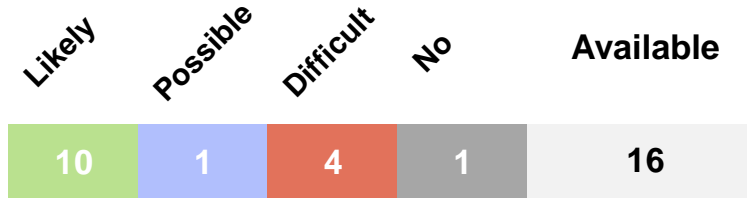
Completed ventilation table with vent calculations demonstrating compliance with the relevant standards.

Confirmation that project has MERV 11 or higher filters.

Ventilation rate procedure or CEN calculations and documentation of assumptions for calculation variables.



Indoor Environmental Quality



EQp2	Environmental Tobacco Smoke (ETS) Control	Client	P
	<p>OPTION 1</p> <ul style="list-style-type: none"> Prohibit smoking in the building. Locate any exterior designated smoking areas at least 7.5 meters away from entries, outdoor air intakes and operable windows. <p>OR</p> <p>Other options have been omitted for simplicity as they are not relevant to this project.</p>	<p>Compliance will be achieved by default as per UK law, however additional attention must be paid to the external smoking policy - we need to clearly communicate the policy with signage which is located and visible near to all entrances.</p>	Notes
	<p>Deliverables</p> <p>Option 1: Confirm smoking prohibited on site and provide evidence of signage communicating the exterior smoking policy.</p> <p>OR</p> <p>Option 1: Confirm smoking prohibited inside building and within 7.5m of doors, windows or air intakes and a site plan/map showing the location of the designated outdoor smoking/non-smoking areas.</p>		

EQc1	Enhanced Indoor Air Quality Strategies	M.Eng	2
	<p>Option 1. Enhanced IAQ strategies (1 point)</p> <p>Comply with the following requirements, as applicable. (additional information will be provided to the design team)</p> <p>Mechanically ventilated spaces:</p> <ul style="list-style-type: none"> A. <u>entryway systems</u>: permanent 3m entryway systems B. <u>interior cross-contamination prevention</u>: Sufficient exhaust and negative pressure to rooms where hazardous chemicals may be present. C. <u>filtration</u>: MERV 13 or F7. <p>Naturally ventilated spaces:</p> <ul style="list-style-type: none"> A. <u>entryway systems</u>. D. <u>natural ventilation design calculations</u>: Follow CIBSE AM10. <p>Mixed-mode systems:</p> <ul style="list-style-type: none"> A. <u>entryway systems</u>. B. <u>interior cross-contamination prevention</u> C. <u>filtration</u>. D. <u>natural ventilation design calculations</u> E. <u>mixed-mode design calculations</u>: comply with CIBSE Applications Manual 13–2000. 	<p>The project will be entirely mechanically ventilated. There has been no proposed changes to the previous strategy.</p> <p>Option 1: 1 credit likely</p> <ul style="list-style-type: none"> Entryway systems are expected to be provided. Interior cross-contamination may not be applicable. A10 to confirm whether the building will include rooms where hazardous chemicals will be handled. Filtration requirements are part of the GPR. <p>Option 2: 1 credit likely</p> <ul style="list-style-type: none"> Increased ventilation rates are required by the GPR. CO₂ sensors in occupied areas may be included in the GPR. A10 to confirm. 	Notes



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Option 2. Additional enhanced IAQ strategies (1 point)

Comply with the following requirements, as applicable (select one):

Mechanically ventilated spaces.

- A. exterior contamination prevention: air pollutant levels below thresholds
- B. increased ventilation: increase ventilation rates by 30% above EQp1.
- C. carbon dioxide monitoring: Monitor CO₂ in densely occupied spaces
- D. additional source control and monitoring: monitor other contaminants.

Naturally ventilated spaces.

- A. exterior contamination prevention;
- D. additional source control and monitoring
- E. natural ventilation room by room calculations: Follow CIBSE AM10

Mixed-mode systems.

- A. exterior contamination prevention
- B. increased ventilation
- D. additional source control and monitoring
- E. natural ventilation room-by-room calculations.

Deliverables

Scaled floor plans showing locations and measurements of entryway systems.

List of rooms with hazardous chemicals, areas, exhaust rate, separation method.

Filters schedules highlighting MERV rating for all units supplying outdoor air.

Natural ventilation / mixed mode: calculations and narrative demonstrating appropriate strategies.

CO₂ monitoring: list of densely occupied spaces, space type, floor plans showing sensors location, design CO₂ levels and narrative.

Low-Emitting Materials

3

Arch

3

Option 1. Product Category Calculations

Achieve the LEED threshold level of compliance with emissions and content standards for 2 to 6 of the 7 product categories (further information will be provided).

Option 2. Budget Calculation Method

If some products in a category do not meet the criteria, project teams may use the budget calculation method.

Determine the percentage of compliant products in each category: walls, flooring, ceilings, insulation and calculate the overall % compliance.

Percentage	Points
≥ 50% and < 70%	1
≥ 70% and < 90%	2
≥ 90%	3

As previously noted, the requirements for this credit are closely aligned with both BREEAM and the GPR. As such, compliance should not be challenging.

Sustainability credentials for each product will be recorded as the project progresses on the Sustainability Materials Tracker.

Deliverables

Product information with VOC levels and emission tests results.



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

EQc3	Construction Indoor Air Quality Management Plan	1				Cont.	1
	<p>Develop and implement an Indoor Air Quality (IAQ) Management Plan associated with the construction and preoccupancy phases of the building.</p> <ul style="list-style-type: none"> - During construction, meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings. - Protect absorptive materials stored on-site and installed from moisture damage. - Do not operate permanently installed air-handling equipment during construction unless MERV 8 / F5 filters are installed at each return air grille and return or transfer duct inlet opening such that there is no bypass around the filtration media. - Replace all filtration media with the final design filtration media immediately before occupancy. - Prohibit smoking within 8m of the building during construction. <p>Deliverables</p> <p>IAQ management plan or detailed checklist, highlighting non-smoking policy.</p> <p>Narrative describing protection measures for absorbent materials.</p> <p>Annotated photographs of indoor air and environmental quality measures.</p> <p>Record of filtration media.</p>					<p>There is no change to the proposed strategy - the requirements for this credit are aligned with those in BREEAM, and so it is likely that one document / plan can be produced to cover both disciplines. It will be the responsibility of the main contractor to produce and implement this plan, and so the requirements for this have been included in the Contractor tender documents.</p>	Notes

EQc4	Indoor Air Quality Assessment	2				Cont.	2
	<p>Option 1. Flush-out (1 point)</p> <p><u>Path 1. Before occupancy</u></p> <p>Install new filtration media and perform a building flush-out by supplying a total air volume of 4,270m³/m² of outdoor air while maintaining an internal temperature of at least 15°C and no higher than 27°C and relative humidity no higher than 60%.</p> <p><u>Path 2. During occupancy</u></p> <p>If occupancy is desired before the flush-out is completed, the space may be occupied only after delivery of a minimum of 1,100m³/m² of outdoor air. Once the space is occupied, it must be ventilated at a minimum rate of 1.5 l/s/m². During each day of the flush-out period, ventilation must begin at least 3 hours before occupancy and continue during occupancy. These conditions must be maintained until a total of 4 270m³/m² of outdoor air has been delivered to the space.</p> <p>OR</p> <p>Option 2. Air testing (2 points)</p> <p>After construction ends and before occupancy, but under ventilation conditions typical for occupancy, conduct baseline IAQ testing using protocols consistent with LEED requirements.</p> <p>Demonstrate that contaminants do not exceed the maximum concentrations required by LEED.</p> <p>Deliverables</p> <p>Flush-out report.</p> <p>IAQ testing report.</p>					<p>The Droid Avengers include a number of targets relating to indoor air quality and requires air quality testing - this is therefore somewhat in line with the LEED criteria.</p> <p>G&T confirm that an allowance has been made within the cost plan, as such compliance is deemed likely at this stage of the project.</p>	Notes



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Thermal Comfort		1	M.Eng	1	
EQc5	<p>Thermal comfort design Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2010, Thermal Comfort Conditions for Human Occupancy or equivalent (ISO 7730:2005, EN 15251:2007).</p> <p>Thermal comfort control Provide individual thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal comfort controls for all shared multioccupant spaces, and for any individual occupant spaces without individual controls.</p>	<p>A10 explored the possibility of integrating individual occupant thermal control in the early stages of design but this has since been deemed unfeasible. Likelihood has therefore been moved to 'no'.</p>			Notes
	<p>Deliverables Description of weather data used to determine operative temperatures, relative humidity, outdoor temperatures. Plots or calculation results verifying that design parameters meet ASHRAE Standard 55–2010. List of spaces by type, quantity, and controls Narrative describing design strategy used in each space.</p>				

Interior Lighting		2	Arch	2	
EQc6	<p>Option 1. Lighting control (1 point) Provide individual lighting controls for 90% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences with at least three lighting levels (On, Off, Mid-level). AND Provide lighting system controllability for all shared multi-occupant spaces to enable lighting adjustment that meets group needs and preferences. AND/OR</p> <p>Option 2. Lighting quality (1 point) Choose four of the following strategies: A. use light fixtures with a luminance of less than 2,500 cd/m² between 45 and 90 degrees from nadir. B. use light sources with a CRI of 80 or higher. C. use light sources that have a rated life of at least 24,000 hours (for 75% of total connected lighting load). D. use direct-only overhead lighting for 25% or less of the total connected lighting load for all regularly occupied spaces. E. for 90% of the regularly occupied floor area, average surface reflectance: 85% for ceilings, 60% for walls, and 25% for floors. F. select furniture finishes with average surface reflectance: 45% for work surfaces, and 50% for movable partitions. G. For 75% of the regularly occupied floor area, meet ratio of average wall surface illuminance (excluding fenestration) to average work plane (or surface, if defined) illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of 60% for walls. H. For 75% of the regularly occupied floor area, meet ratio of average ceiling illuminance (excluding fenestration) to work surface illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of 85% for ceilings.</p>	<p>BDP confirm that there is a task based lighting strategy currently proposed. Individuals will have control of their own lighting, thus demonstrating compliance with option 1 - this is therefore deemed likely.</p> <p>Option 2 is also deemed likely at this stage of the design but further calculations should be undertaken to confirm this. MM to work with BDP to develop the floor area schedule - this will assist with calculations.</p>			Notes
	<p>Deliverables</p>				



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Table of individual occupant and multioccupant spaces and lighting controls in each space.

Table of regularly occupied spaces and associated lighting details.

Calculations of total connected lighting load.

Lighting details, including manufacturer and model, results of estimations, or in situ or laboratory photometric tests.

List of ceiling, wall, and floor surfaces, furniture and their associated surface reflectance values.

Average surface reflectance calculations.

List of work surfaces and illuminance values (lux).

Daylight

EQc7

Provide manual or automatic (with manual override) glare-control devices for all regularly occupied spaces.

Select one of the following three options.

Option 1. Simulation: Spatial Daylight Autonomy (2–3 points)

Demonstrate through annual computer simulations that a spatial daylight autonomy of 300 lux for 50% of occupied hours of at least 55% or 75% is achieved.

sDA	Points
55%	2
75%	3

Demonstrate through annual computer simulations that annual sunlight exposure of 1000 lux for more than 250 hours of occupied time of no more than 10% is achieved.

Option 2. Simulation: Illuminance Calculations (1–2 points)

Demonstrate through computer modelling that illuminance levels will be between 300 lux and 3,000 lux for 9 a.m. and 3 p.m for the floor area below:

% floor area	Points
75%	1
90%	2

Option 3. Measurement (2-3 points)

Achieve illuminance levels between 300 lux and 3,000 lux for the floor area below:

% floor area	Points
75%	2
90%	3

Deliverables

Floor plans highlighting regularly occupied spaces.

List of glare-control devices for all windows with their control mechanism.

List of compliant spaces with their annual summary values for sDA and ASE.

Geometric plots from simulations.

Narrative or output file describing daylight simulation program, simulation inputs, and weather file.

List of compliant spaces with their calculated illuminance values.

		3		M.Eng	3
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Compliance with this credit is still thought to be difficult, however it should be noted that all meeting rooms which are dedicated for VC purposes, may be excluded from the calculations. Given the working practices in Google offices, this can be argued for many of the meeting rooms. A10 will monitor the development of this credit as the design progresses.

Notes



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Quality Views

EQc8

Achieve a direct line of sight to the outdoors via vision glazing for 75% of all regularly occupied floor area.

Additionally, 75% of all regularly occupied floor area must have at least two of the following four kinds of views:

- multiple lines of sight to vision glazing in different directions at least 90 degrees apart
- views that include at least two of the following: (1) flora, fauna, or sky; (2) movement; and (3) objects at least 25 feet from the exterior of the glazing
- unobstructed views located within the distance of three times the head height of the vision glazing
- views with a view factor of 3 or greater, as defined in "Windows and Offices; A Study of Office Worker Performance and the Indoor Environment."

Views into interior atria may be used to meet up to 30% of the required area.

There is no proposed change to the strategy at this stage. Initial discussions suggest that the complexity of the internal layout could make this credit challenging.
MM and BDP to review as the design progresses.

Arch 1

Notes

Deliverables

Sections, elevations, diagrams, renderings, or photos indicating sight lines to glazing do not encounter permanent interior obstructions.

Floor plans or diagrams identifying regularly occupied spaces.

Multiple sight lines for each regularly occupied space.

Sight lines and area indicating three times head height.

Area with view factor of 3 or greater.

Method for determining view factor for each typical occupant location.

Acoustic Performance

EQc9

HVAC Background noise

Achieve a background noise level of 35 dBA or less from HVAC systems in classrooms and other core learning spaces.
See EQp3 for methodology and standards.

Sound Transmission

Meet the composite sound transmission class (STCC) ratings listed in Table 1, or local building code, whichever is more stringent.

Reverberation Time

Meet the reverberation time requirements provided by the LEED v4 standard (adapted from Table 9.1 in the Performance Measurement Protocols for Commercial Buildings)

For an office building, the requirements are as follows:

- . Private office, conference rooms : <0.6 T60 at 500Hz, 1000Hz and 2000Hz
- . Open plan office: <0.8 T60 at 500Hz, 1000Hz and 2000Hz

Compliance with this credit is still deemed possible.
MM to continue discussions with Sandy Brown as the design progresses.

Acou 1

Notes



Indoor Environmental Quality

Likely	Possible	Difficult	No	Available
10	1	4	1	16

Sound Reinforcement and Masking Systems

Sound Reinforcement

For all large conference rooms and auditoriums seating more than 50 persons, evaluate whether sound reinforcement and AV playback capabilities are needed.

If needed, the sound reinforcement systems must meet the following criteria:

- A speech transmission index (STI) of at least 0.60 or common intelligibility scale (CIS) rating of at least 0.77 at representative points within the area of coverage to provide acceptable intelligibility.
- A minimum sound level of 70 dBA.
- Maintain sound-level coverage within +/-3 dB at the 2000 Hz octave band throughout the space.

Masking Systems

For projects that use masking systems, the design levels must not exceed 48 dBA. Ensure that loudspeaker coverage provides uniformity of +/-2 dBA and that speech spectra are effectively masked.

Deliverables

Occupied spaces sound level values, calculations, measurement narrative or manufacturer data.

Noise reduction narrative.

STC ratings for space adjacencies.

Reverberation time criteria for each room.

Google KGX1



Innovation in Design

Likely	Possible	Difficult	No	Available
3	0	3	0	6

	Likely	Possible	Difficult	No	Category	Count
Innovation in Design: Access to Quality Transit	1	0	0	0	Arch	1
Innovation in Design: Reduced Parking Footprint	1	0	0	0	Arch	1
Innovation in Design: TBC	0	0	1	0	Arch	1
Innovation in Design: TBC	0	0	1	0	Arch	1
Innovation in Design:TBC	0	0	1	0	Arch	1
LEED® Accredited Professional	1	0	0	0	LEED	1

Google KGX1



Regional Priority

Likely	Possible	Difficult	No	Available
2	2	0	0	4

Category	Likely	Possible	Difficult	No	LEED	Count
Regional Priority: Sensitive Land Protection	1	1	0	0	LEED	1
Regional Priority: Protect or Restore Habitat (2 pt threshold)	1	1	0	0	LEED	1
Regional Priority: Rainwater Management (2 pt threshold)	0	1	1	0	LEED	1
Regional Priority: Optimise Energy Performance (8 pt threshold)	0	1	1	0	LEED	1

Recommendations

- Project title:** Google KGX1
- Project description :** LEED Certification
- Rating system used :** LEED v4 BD+C
- Date of latest issue :** 17 January 2017

Current predicted score: 62

Current predicted rating: GOLD

Additional points needed for Platinum: 18

The current predicted score of **62** is based upon our understanding of the initial design proposals, and ongoing discussions with the project team.

The following recommendations will help the team align the design with the LEED criteria and present a number of credits that could be earned to provide the required buffer for the desired LEED rating. These recommendations have been classified in 4 categories based on our assessment of associated cost implications. All cost implications are understood to come in addition to the inherent cost of achieving a BREEAM 'Excellent' rating.

Additional credits	Credit	Submission phase	Credit criteria	Primary responsibility	Notes
No or Low cost or programme implications					
2	WE c 1	Design	Outdoor water use reduction	L. Architect	Landscape architect to review requirements and advise. Although RWH will assist compliance, strong consideration must be given to the planting strategy
4	SS c 4	Design	Rainwater management.	Civil Engineer / L. Architect	The requirements for this credit are relatively stringent but may not be too different from what is already being targeted. <i>Note: Compliance with this credit would yield one additional point in the RP category.</i>
3	MR c 1	Design	Life-cycle impact reduction	MM / SCP	Sturgis Carbon Profiling have now been appointed, and so compliance with these three points may be possible. MM raise query with USGBC to determine whether SCP's approach is compliant.
Modified predicted score: 71			Modified predicted rating: GOLD		
Medium cost or programme implication or technical uncertainty					
1	SS c 6	Design	Light pollution reduction.	E. Engineer	Compliance is deemed difficult due to the building being a zero lot line site. However, LEED offers options for such projects that could be investigated. BDP to review further, particularly the potential impact of interior light spill and retail illumination.

2	WE c	2	Design	Indoor water use reduction	M. Engineer	Calculations confirm that earning an additional 2 points under this issue would require specific design measures such as greywater re-use. This is currently being reviewed but will likely be a significant re-design and potential cost uplift.
2	EA c	2	Design	Optimise energy performance	ASHRAE Modeller	Current likely score: 3 points The project could potentially earn an additional 2 points with limited cost implications. This is dependent on the outcome of an initial ASHRAE Energy Model.
1	EQ c	9	Design	Acoustic performance	Acoustician	Feasibility of this credit remains to be confirmed by the acoustician. It is possible that this credit may be a no-cost option.

Modified predicted score: 77

Modified predicted rating: GOLD

High cost or programme implication

3	EA c	2	Design	Optimise energy performance	M. Engineer / ASHRAE Modeller	Current likely score: 3 points Possible score with limited cost: 5 points An increased score under this credit (potentially up to 8-10 points) will likely have significant cost implications. Team are currently looking into the potential of PV panels on the roof, to meet both BREEAM and S106.
3	EA c	5	Design	Renewable energy production	M. Engineer / ASHRAE Modeller	It is likely that PV panels will be included in the design to ensure that the S106 and BREEAM targets can be achieved. It may therefore be the case that some points can be achieved under LEED by default. A10 to advise on PV requirement as the design and modelling progresses.
3	EQ c	7	Design	Daylight	M. Engineer	Compliance is still deemed difficult, however the team agree that it should remain as a credit to consider and will be reviewed once the daylight modelling exercise is complete. If meeting rooms can be excluded it is likely to help compliance.

Modified predicted score: 86

Modified predicted rating: PLATINUM

Additional credits with unknown cost, programme or technical implications

1	LT c	5	Design	Investigate presence of compliant bicycle network.	Architect	No cost credit. Depends on presence of a compliant bicycle network. MM are in the process of reviewing existing around KGX and also future proposals.
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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
0	05 July 2016	A.Courreges	J Holland	E.Gulacsy	Stage 2 Issue
1	23 September 2016	J. Binks	L. Aminu	E.Gulacsy	Update
2	17 January 2017	J. Binks	L. Aminu	E.Gulacsy	Stage 3 Issue

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E. LEED Pre-assessment (Retail)



Google KGX1 Retail Façade

LEED for Core & Shell Scorecard

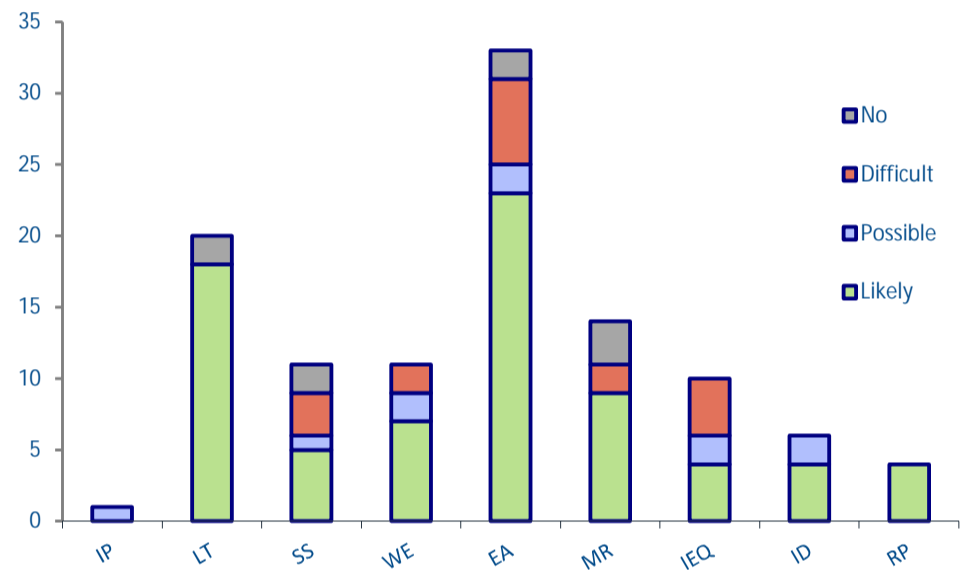
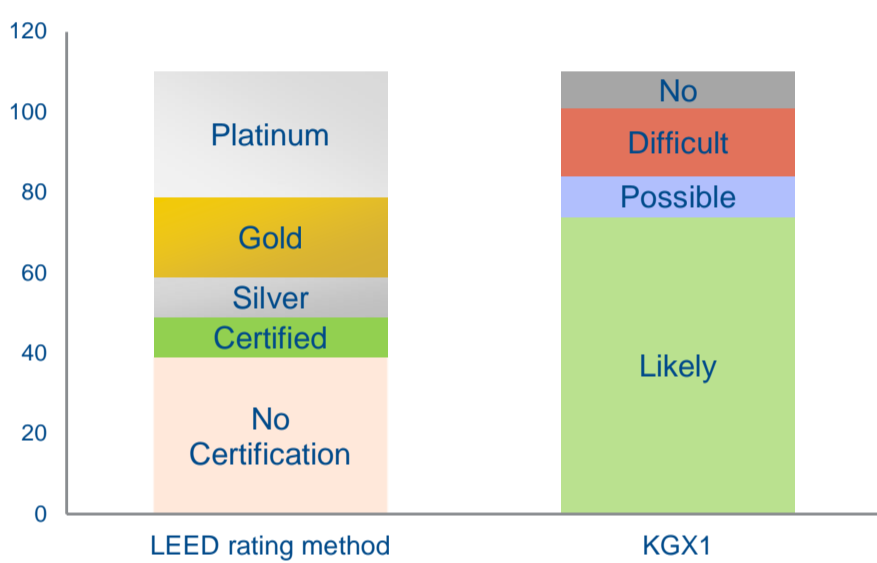
Rev 02

LEED Project Summary

Project title:	Google KGX1 Retail Façade
Project description :	LEED Certification
Rating system used :	LEED v4 BD+C for Core and Shell
Date of latest issue :	28 January 2022

Current predicted LEED score: 74 points
Current predicted LEED rating: GOLD
Potential LEED rating: PLATINUM

It is Google's aspiration for the project to pursue LEED certification. It is the project target to achieved LEEDv4 Gold as a minimum, with the aspirational target of Platinum being set. To realise this aspiration, the project needs to demonstrate compliance with a minimum of 80-points through design and construction measures. This report presents a summary of performance for the KGX1 project against the requirements of the LEED rating system. The likelihood of achieving each credit has been aligned with current project design considerations and construction practices.



Project Team:

	Company	Short	Named individual
Owner:	Google	Client	Michael Mercer Cox
Architect:	Heatherwick	Hwick	Elisa Simonetti
Mech Engineer:	N/A	N/A	N/A
Civil Engineer:	N/A	N/A	N/A
Landscape Architect:	N/A	N/A	N/A
Ecologist	N/A	N/A	N/A
Acoustician	N/A	N/A	N/A
Commissioning Agent:	TBC	CXA	TBC
Project Manager :	Turner & Townsend	T&T	Craig Mclachlan
Contractor:	TBC	Cont.	TBC
Energy Modelling:	TBC	EnMod	TBC
LEED Energy Modelling	TBC	EnModL	TBC
LEED AP :	Mott MacDonald	MM	Eszter Gulacsy

Definition of credit likelihood categories:

Likely	Credit is usually easily achieved as a matter of best practice or by virtue of site selection
Possible	No information received yet or technical difficulties are expected
Difficult	Credit can only be achieved at high capital expense or great technical difficulty
No	Credit is not applicable or cannot be achieved by virtue of the project's characteristics

LEED Project Scorecard

Current Predicted Rating: **GOLD**

Potential Rating: **PLATINUM**

(Likely + Possible credits)

28 January 2022

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** >80 points

Credit	Current Credits					Phase	Credit Title	Primary Responsibility	Action by	Status / Comments	Status / Comments
	Available	Likely	Possible	Difficult	No						
Integrative process											
IP c 1	1	0	1	0	0	Design	Integrative process	T&T	Client	N/A	The IP worksheet has been produced for the BB and following recent updates by A10 is ready for resubmission. Much of the existing BB information can be used.
Location and Transportation											
LT c 1	2	2	0	0	0	Design	Sensitive land protection	Client	Hwick	N/A	This credit was awarded at preliminary design review for the BB. No further action required
LT c 2	3	3	0	0	0	Design	High priority site	Client	Hwick	N/A	Credit due to be re-submitted for the BB. MM to follow up on this for the BB. No further action for the team required.
LT c 3	6	6	0	0	0	Design	Surrounding density and diverse uses	Hwick	Hwick	N/A	This credit was awarded at preliminary design review for the BB. No further action required
LT c 4	6	6	0	0	0	Design	Access to quality transit	Tra	Client	N/A	This credit was awarded at preliminary design review for the BB. No further action required
LT c 5	1	0	0	0	1	Design	Bicycle facilities	Hwick	Hwick	N/A	There were no short term cycle spaces provided within the project scope, but instead spaces in the wider public realm spaces are for use by anyone. Therefore this credit it not available to the project without major changes to the BB.
LT c 6	1	1	0	0	0	Design	Reduced parking footprint	Client	Hwick	N/A	This credit was awarded at preliminary design review for the BB. No further action required
LT c 7	1	0	0	0	1	Design	Green vehicles	Client	Hwick	N/A	No green vehicle spaces were being provided as part of the BB, so this credit is not available to the project.
Sustainable Sites											
SS p 1	Pre-req	0	0	0	0	Construction	Construction activity pollution prevention	Cont.	Cont.	N/A	Contractor to provide monthly checklists and date-stamped photographs to demonstrate that the required ESC measures are being implemented. These will be limited and fall within the scope of LendLease for the basebuild.
SS c 1	1	0	0	0	1	Design	Site assessment	N/A	N/A	N/A	Credit was not targeted on the BB as not all of the required site surveys were completed as part of the early works of the project.
SS c 2	2	0	0	2	0	Design	Site development - protect or restore habitat	N/A	N/A	N/A	There is only minimal landscaping associated with the project itself (not the wider BB development) and therefore this credit is not likely to be achieved.
SS c 3	1	0	0	0	1	Design	Open space	N/A	Client	N/A	The project is on a zero lot line (within the BB building) and therefore this credit is not achievable.
SS c 4	3	3	0	0	0	Design	Rainwater management	N/A	-	N/A	This credit was awarded at preliminary design review for the BB. No further action required.
SS c 5	2	1	1	0	0	Design	Heat island reduction	Hwick	MM	N/A	Although a design credit, this is to be submitted with the construction review for the Basebuild. Upon confirmation, the same credits should be available to the façade project as well.
SS c 6	1	0	0	1	0	Design	Light pollution reduction	N/A	MM	N/A	Compliance with this credit was challenging for the BB. For the Façade project, the requirements to reduce external lighting may be prohibitive for the high profile nature of the retail space. Therefore the credit is deemed difficult.
SS c 7	1	1	0	0	0	Design	Tenant design and construction guidelines	T&T	T&T	N/A	This will be a possible and desirable route to secure additional credits for the façade project, which would otherwise be out of scope for the shell only space.
Water Efficiency											
WE p 1	Pre-req	0	0	0	0	Design	Outdoor water use reduction	N/A	N/A	N/A	The project is on a zero lot line (within the BB building) and therefore this pre-requisite is not applicable.
WE p 2	Pre-req	0	0	0	0	Design	Indoor water use reduction	Hwick	Arch	N/A	If BB sanitaryware spec is used, this requirement should be met. Unclear whether any sanitaryware will be installed as part of the fit-out at later stages of the project. For this Core & Shell scope, the BB sanitaryware spec will apply.
WE p 3	Pre-req	0	0	0	0	Design	Building-level water metering	N/A	MM	N/A	Pre-requisite awarded as part of preliminary design review for the BB. Assume metering strategy applies here as well.
WE c 1	2	0	0	2	0	Design	Outdoor water use reduction	N/A	N/A	N/A	The project is on a zero lot line (within the BB building) and therefore this credit is not achievable.
WE c 2	6	6	0	0	0	Design	Indoor water use reduction	Hwick	Arch	N/A	If BB sanitaryware spec is used, this requirement should be met. Unclear whether any sanitaryware will be installed as part of the fit-out at later stages of the project. For this Core & Shell scope, the BB sanitaryware spec will apply.
WE c 3	2	0	2	0	0	Design	Cooling tower water use	N/A	N/A	N/A	Pending credit on the BB. Compliance to be confirmed.

LEED Project Scorecard

Current Predicted Rating: **GOLD**

Potential Rating: **PLATINUM**

(Likely + Possible credits)

28 January 2022

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** >80 points

WE c 4	1	1	0	0	0	Design	Water metering	N/A	N/A	N/A	Pre-requisite awarded as part of preliminary design review for the BB. For this Shell & Core project, the metering strategy for the units will be the same as the BB.
Energy and Atmosphere											
EA p 1	Pre-req	0	0	0	0	Construction	Fundamental commissioning	CXA	Client	N/A	Clarification is needed whether the Cx process for the retail part will be in scope for the BB. MM to check with Core Group.
EA p 2	Pre-req	0	0	0	0	Design	Minimum energy performance	N/A	MM	N/A	An energy model will need to be produced to ASHRAE requirements to assess the performance of the retail units. Based on the BB performance, compliance is likely.
EA p 3	Pre-req	0	0	0	0	Design	Building-level energy metering	N/A	N/A	N/A	BB metering strategy will be deployed on the façade project as well.
EA p 4	Pre-req	0	0	0	0	Design	Fundamental refrigerant management	N/A	N/A	N/A	Refrigerants are provided by the BB - also these requirements are UK/EU law.
EA c 1	6	4	0	2	0	Construction	Enhanced commissioning	CXA	CXA	N/A	Clarification is needed whether the Cx process for the retail part will be in scope for the BB. MM to check with Core Group.
EA c 2	18	12	2	4	0	Design	Optimize energy performance	EnModL	N/A	N/A	Energy modelling needs to be completed for this. Based on shell only scope. Greatest issue likely to be the lighting installation. Potential for TSLA.
EA c 3	1	1	0	0	0	Design	Advanced energy metering	N/A	-	N/A	BB metering strategy will be deployed on the façade project as well, so this credit is likely.
EA c 4	2	0	0	0	2	Design	Demand response	Client	N/A	N/A	Not available in the location and not appropriate for retail.
EA c 5	3	3	0	0	0	Design	Renewable energy production	Client	N/A	N/A	With Google's new renewable energy programme, these credits are achieved by default.
EA c 6	1	1	0	0	0	Design	Enhanced refrigerant management	N/A	N/A	N/A	Refrigerants are provided by the BB. This credit was awarded on the BB.
EA c 7	2	2	0	0	0	Construction	Green power and carbon offsets	Client	-	N/A	This is achieved by default because of Google's new renewables and carbon offsetting programme.
Materials and Resources											
MR p 1	Pre-req	0	0	0	0	Design	Storage and collection of recyclables	Hwick	Client	N/A	Assuming retail units will have a dedicated waste storage area - the LEED requirements for recycling segregation and storage will need to be met. MM to investigate with BB and Fit-out Teams to confirm this.
MR p 2	Pre-req	0	0	0	0	Construction	Waste management planning	Cont.	Cont.	N/A	We will require a copy of the site waste management plan produced by the contractor for review. The documentation will come from a mix of BB contractor and façade project contractor.
MR c 1	6	3	0	0	3	Construction	Building life-cycle impact reduction	Hwick	Hwick	N/A	Carbon modelling - potential v4.1 substitution. Pursuing option 4.
MR c 2	2	1	0	1	0	Construction	BPDO - environmental product declarations	Hwick	Hwick	N/A	Some of the materials tracking information will be provided by LendLease as part of the basebuild material submissions. Additional documentation will be required from the Façade contractor to comply with these requirements.
MR c 3	2	1	0	1	0	Construction	BPDO - sourcing of raw materials	Hwick	Hwick	N/A	At Stage 3, specifications should include requirements for all BPDO credits with work commencing with manufacturers to source compliant materials. MM to monitor this during Stage 4.
MR c 4	2	2	0	0	0	Construction	BPDO - material ingredients	Hwick	Hwick	N/A	
MR c 5	2	2	0	0	0	Construction	Waste management	Cont.	Cont.	N/A	Monthly waste management reporting will be required. Evidence to be compiled from a mix of BB and façade contractor.
Indoor Environmental Quality											
EQ p 1	Pre-req	0	0	0	0	Design	Minimum IAQ performance	N/A	N/A	N/A	Pre-requisite - mechanically ventilated spaces to meet the requirements of ASHRAE 62.1 2010. On this Shell & Core project, ventilation rates from BB apply.
EQ p 2	Pre-req	0	0	0	0	Design	Environmental tobacco smoke control	Client	Client	N/A	This pre-requisite was awarded as part of the preliminary design review on the BB. Submission to use the BB policy and signage.
EQ c 1	2	0	2	0	0	Design	Enhanced indoor air quality strategies	M.Eng / Arch	M.Eng / Arch	N/A	Unclear who is responsible for this credit at the moment. MM to check with BDP, whether their response to the corresponding BB credit covers the Retail units.
EQ c 2	3	3	0	0	0	Construction	Low-emitting materials	Hwick	Hwick	N/A	Materials tracking will be required to ascertain if products considered for specification will meet the VOC emissions and content requirements.
EQ c 3	1	1	0	0	0	Construction	Construction IAQ Management Plan	Cont.	Cont.	N/A	IAQ Construction Management Plan to be produced by façade contractor and implemented in conjunction with LendLease's IAQ management plan.
EQ c 4	3	0	0	3	0	Design	Daylight	Hwick	Hwick	N/A	Credit was not deemed feasible on the BB and with the units being on the ground floor, this is not likely to be achieved.

LEED Project Scorecard

Current Predicted Rating: **GOLD**

Potential Rating: **PLATINUM**

(Likely + Possible credits)

28 January 2022

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** >80 points

EQ c 5	1	0	0	1	0	Design	Quality views	Hwick	Hwick	N/A	Deemed difficult to achieve due to the floorplan/depth of the building
Innovation											
ID c 1	1	1	0	0	0	Design	Innovation in Design: Reduced Parking Footprint	Hwick	T&T	N/A	Achieved for the BB. Likely for the Façade project.
ID c 1	1	1	0	0	0	Design	Innovation in Design: Sustainable wastewater management	-	-	N/A	Achieved for the BB. Likely for the Façade project.
ID c 1	1	1	0	0	0	Construction	Innovation in Design: Pilot Credit (Circular Products)	-	MM	N/A	Achieved for the BB. Likely for the Façade project.
ID c 1	1	0	1	0	0	Construction	Innovation in Design: TBC	Client	T&T	N/A	Possibilities for additional Innovation point to be discussed with MM and the project team.
ID c 1	1	0	1	0	0	Construction	Innovation in Design: TBC	-	-	N/A	Possibilities for additional Innovation point to be discussed with MM and the project team.
ID c 2	1	1	0	0	0	Construction	LEED® Accredited Professional	-	-	N/A	Achieved by default due to the appointment of MM.
Regional Priority											
RP c 1	1	1	0	0	0	Design	Regional Priority:	MM	MM	N/A	Credit awarded as part of preliminary design review for the BB. MM to replicate credit evidence as required.
RP c 1	1	1	0	0	0	Design	Regional Priority:	MM	MM	N/A	Credit awarded as part of preliminary design review for the BB. MM to replicate credit evidence as required.
RP c 1	1	1	0	0	0	Design	Regional Priority:	MM	MM	N/A	Credit awarded as part of preliminary design review for the BB. MM to replicate credit evidence as required.
RP c 1	1	1	0	0	0	Design	Regional Priority:	MM	MM	N/A	An additional credit can be pursued here. Team to consider the options is discussion with MM. An RP for 'Optimise Energy Performance' could be considered if there is an uplift in the score for EAc2 or RP: Light Pollution Reduction' could be considered.

110 74 84 101 110

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
1	27 August 2021	S. Griffiths	J. Binks	E. Gulacsy	
2	28 January 2022	S. Griffiths	T. Lodge	E. Gulacsy	

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F. Environmental Sustainability Plan Addendum

Environmental Sustainability Plan Addendum

Zone A Building
Revision P02, March 2022

Prepared by: M, Kobrina
Checked by: Y, Rhee
Approved by: M, Davey

23 / 01 / 2022
25 / 02 / 2022
28 / 02 / 2022

Introduction

Atelier Ten has been instructed to produce this addendum document to the Environmental Sustainability Plan produced by Mott MacDonald that accompanied the Reserved Matters Submission for the proposed Zone A Building in 2017 (Appendix A).

Following the change of the retail facade design for Zone A Building, this addendum document will accompany the new Reserved Matters application. This document summarises the changes to facade performance and demonstrates that these changes have no adverse impact to the overall energy performance of the whole building as presented in the original Reserved Matters application.

This addendum document should be read in conjunction with the original Energy Sustainability Plan.

Planning requirements

This document responds to the following planning requirements:

- S106 - Section X Obligation 2b: Achieve a 32% carbon reduction compared to the 'business as usual' benchmark (Part L 2002) with energy efficient building design and technologies, and the connection to an existing district network.
- S106 - Section X Obligation 2c: Achieve a 39% carbon reduction compared to the 'business as usual' benchmark (Part L 2002), with on-site renewable energy technologies.
- S106 - Section X Obligation 6: Achieve a 5% carbon reduction from energy efficient building design and technology compared with the emissions permitted under the national Building Regulations prevailing at the time of RMA submission (Part L 2013 with 2016 amendments).

Please note that the above requirements are for the whole building, and the retail component that is subject to the change discussed here should be contributing to achieving the requirements.

The requirement to achieve 39% carbon reduction compared to Part L 2002 is automatically achieved by meeting the current building regulation (Part L 2013 with 2016 amendments), which requires more than 39% reduction compared to Part L 2002. Atelier Ten has demonstrated compliance with the planning requirement within the Environmental Sustainability Plan with the base building achieving a 22% carbon reduction compared to Part L 2013 notional building.

Therefore, as long as the retail façade performance complies with what was assumed for the base building as-designed Part L model, it is deemed to comply with the planning requirement.

Summary of changes

In the base building Part L model used for the Environmental Sustainability Plan, the total 1,862m² of external wall areas and 858m² of window areas are modelled for the retail facade.

From the model of the current design received from Heatherwick Studio on the 16th November, 2021, the following has been modelled: a total 2,400m² of external wall areas and 575m² of window areas.

Compared to the previous model, the overall external wall areas have been increased by approximately 29%, however, the glazing area has been reduced by 33%.

From the previous design, all the envelope parameters are unchanged except for the g-value, which has been relaxed to 0.7. To compensate for the relaxed g-value, more solar shading in the form of overhang is incorporated into the current design (Figure 1.1).

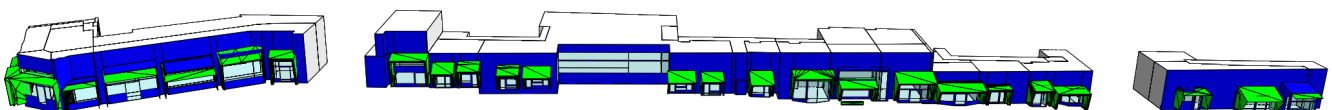


Figure 1.1 IES model capture of the current retail facade design

Impact of changes

In order to assess the impact of the relaxed g-value with overhang, a dynamic thermal model has been developed for the current design and compared against the previous model.

Both models were carried out using the Department for Communities and Local Government (DCLG) approved and updated version of the IES Virtual Environment (VE) 2019, which is an analysis software tool for building modelling and dynamic thermal simulation developed by Integrated Environmental Solutions Ltd (IES). This software package includes the VE Compliance application, which follows the National Calculation Methodology (NCM) for assessing the energy performance of buildings required by the Building Regulations Part L.

The new retail façade has been assessed against the previous design in terms of peak summer solar gains, which affect cooling loads, and peak fabric conductive losses, which affect heating loads. The results are presented in Table 1.1 and 1.2.

It is worth noting that for the thermal performance of the retail space, the original design had worse envelope performance than the notional building but the overall building had a 6.1% improvement with lean measures and 22% improvement with clean and green measures.

With the relaxed g-value, the current design achieves lower solar gain (44.7kW) than the original façade (77.1kW) due to the solar shading in the design. This will reduce the cooling energy consumption of the development as a whole.

The proposed retail design has increased the heat loss through the facade (88.8kW to 117kW), but it is marginal on the scale of the building. Also, while the heat loss for the proposed design is above the notional building, this divergence is lower than the original design (141.1% vs. 134.7%) and therefore, at a building level, energy performance should be equivalent or improved.

Conclusion

The new façade design has a lower absolute or lower relative to the compliance reference cooling or heating demand than the original design, hence the whole building performance will be equivalent or improved for Part L with the proposed design. This means the planning requirements outlined in the introduction and the energy performance committed to in the original Environmental Sustainability Plan should still be met for the whole building.

Table 1.1 Solar Gain

Original Facade	New Facade
Peak (kW)	Peak (kW)
77.1	44.7

Table 1.2 Conductive Losses

	Original Facade			New Facade		
	Peak loss notional (kW)	Peak loss actual (kW)	% Increase	Peak loss notional (kW)	Peak loss actual (kW)	% Increase
Total	36.8	88.8	141.1	49.9	117.0	134.7

