Castlehaven Row Limited

Provender Store

Energy and Sustainability Statement

ES01

Rev A | 14 May 2018

Job number 236388-11

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ARUP

Contents

Appendices

1 Introduction

This document presents the **Energy and Sustainability Statement** supporting the planning application for a change in use of part of the **Provender Store and Arch 11, Stables Market, Chalk Farm Road, Camden NW1 8AH**.

The statement describes how the project responds to national, regional and local policy and planning requirements in relation to energy and sustainability requirements. Moreover, it sets out the approach taken to address requirements for the improved energy and sustainability performance of the refurbished areas of the building once it has been changed to as co-working (Class B1) space.

This document sets out:

- A summary of the proposed project
- Existing planning guidance from the local planning authority, London Borough of Camden (LBC) and requirements for energy and sustainability for refurbishment projects
- Details of how the development responds to the sustainability policies set out in the Camden Local Plan
- The **Energy Statement** for the project, comprising a review of the opportunities to implement measures in the refurbishment process in line with LBC's energy hierarchy: Be Lean; Be Clean; Be Green
- The **Sustainability Statement** for the development, comprising a BREEAM pre-assessment for the development.

2 Summary of the project

The project comprises the refurbishment and change in use from Ancillary Market Space to 'co-working' offices of the first and second floor of the Grade II Listed Provender Store, located in Camden Stables Market, which lies within the Regent's Canal Conservation Area.

The Provender Stall application forms part of a wider suite of submissions within the Stables Market which, taken together, seek to ensure that the upper levels of all buildings are fully utilised and that a suitable mix of leisure and co-working uses (Class B1) are provided.

The two floors are currently under-utilised and the aim is to provide comfortable, well-considered co-working areas separated by glazed partitions and supporting an overall open-plan office environment.

The Design and Access Statement (DAS) provided in the planning application sets out the proposed works in further detail, and notes (in section 3.3) the balance between the refurbishment and change of use, and the steps taken to minimise any adverse impact on the significance of the building.

The Provender Store is one of four buildings designated Grade II by Historic England as the Stanley Sidings. The grading and the historic setting of the Grade II Listed building presents challenges and inhibits the applicability of some building techniques and improvements, where such measures would be contrary to the listed status of the building. The sensitive design approach is to touch the existing building lightly by, for example, avoiding the fixing of stairs into external walls, and carefully installing fixings into mortar joints.

3 Review of planning requirements

3.1 Introduction

The planning context for the development is defined through the Camden Local Plan ('CLP') adopted in 2017. The Local Plan contains several policies on Sustainability that provide the context for this Energy and Sustainability Statement:

- Policy CC1 Climate change mitigation
- Policy CC2 Adapting to climate change
- Policy CC3 Water and flooding
- Policy CC4 Air Quality
- Policy CC5 Waste

The policies set out the requirements for new developments (including for refurbishment / change of use). Paragraph 8.8 of the Local Plan states that any development with a floor area greater than 500m^2 requires an Energy and Sustainability Statement to be developed.

Additional guidance is provided in Camden Planning Guidance 3 (CPG3) which provides the broader context for how sustainability should be considered across the Borough.

3.1.1 Policy CC1 Climate change mitigation

This policy seeks to minimise the effects of climate change by requiring developments to meet the highest environmental standards that are financially viable. It focuses on reducing carbon emissions through application of LBC's energy hierarchy; promoting good access via public transport; encouraging retention of existing buildings; and optimising energy efficiency. It also encourages the use of decentralised energy (within the energy hierarchy).

Developments greater than 500m^2 are required to provide an Energy Statement, and to achieve a 20% reduction in CO_2 emissions from on-site renewables, unless demonstrably unfeasible. New developments should investigate opportunities to connect to a decentralised energy network.

Developments greater than 500m^2 are also encouraged to assess the embodied carbon emissions of the development within the Sustainability Statement.

3.1.2 Policy CC2 Adapting to climate change

This policy encourages developers to include climate change adaption measures such as: green space / green infrastructure; avoiding increased impermeable area; green/blue roofs (where appropriate); and application of LBC's cooling hierarchy.

This policy also sets out the expectation for non-residential redevelopment to achieve BREEAM Excellent.

3.1.3 Policy CC3 Water and flooding

This policy seeks to ensure no increased flood risk, and to achieve reduced flood risk where possible. It also promotes water efficiency in design, and sets out the expectation for BREEMAM water efficiency credits to be achieved.

3.1.4 Policy CC4 Air Quality

This policy targets the causes and impacts of poor air quality, to reduce both the potential impact of new development on overall air quality, and to ensure consideration of occupants' health in new development.

3.1.5 Policy CC5 Waste

Policy CC5 seeks to reduce waste production in the borough, and to ensure that development include facilities for storage/recycling of waste.

4 Response to CC1 Climate Change Mitigation

4.1 Energy statement for existing development

The Local Plan highlights key priorities for developments to:

- Reduce carbon dioxide emissions through design decisions
- Apply the energy hierarchy when developing the strategy for a development

The energy hierarchy is specified in the Local Plan as follows:

1. **Be lean** – use less energy
2. **Be clean** – supply energy as efficiently as possible
3. **Be green** – use renewable energy

The principle of the hierarchy is that the primary initial focus must be on reducing overall consumption (through a range of measures) before giving consideration to an alternative supply strategy, and then finally seeking to include renewable energy generation.

This section provides information on the measures to be considered for developments, within this energy hierarchy.

4.2 Energy efficiency (Be Lean)

4.2.1 Guidance

Guidance is provided in Camden Planning Guidance 3 (CPG3) on the first suite of measures that should be considered – to fulfil the **Be Lean** stage of the energy hierarchy. This focuses on implementing measures that reduce, in overall terms, the need to heat, cool or mechanically ventilate a building, thus reducing the overall energy consumption for the development.

CPG3 notes that special consideration is required for buildings that are protected (i.e. Listed), in order to ensure that their historic and architectural features are preserved. It notes that the Council will aim to balance the conservation of fuel and power against the need to conserve the fabric of the building.

Sections 4.13 – 4.20 provide further guidance on measures that can be considered to improve the thermal efficiency of a listed building. These provide a useful guide and are ranked in order of risk to the impact on heritage and technical risk (low to high):

1. Ensure the building is in a good state of repair
2. Minor interventions:
    a. Insulation
    b. Flue dampers

c. Solar shading measures
d. Energy efficient lighting and appliances
e. Draught-seal doors and windows

3. Upgrade vulnerable elements – e.g. secondary or double glazing
4. Upgrades to building services, provision of advice, and improved controls
5. Major interventions such as solid wall insulation

4.2.2 Energy efficiency measures included in the development

The guidance provided by LBC in section 4.1 is reviewed for relevance below.

Building condition is generally good condition, but (as noted in Section 2.2 of the DAS) the building is currently vacant. Work is ongoing to repair and improve the existing fabric and building envelope of the building.

Minor improvements loft insulation etc is not feasible due to the open roof space of the building, and the building is constructed with solid brick walls which prevents any cavity insulation measures.

The building form benefits from an east-west alignment, which leads to a large amount of direct natural light entering through the south facing windows. While beneficial in terms of reducing the need for artificial light, it does bring a risk of increase solar gain during warm periods of weather. Appropriate solar protection will be incorporated in the building to minimise solar gain, and to enhance user comfort (also addressed through the BREEAM Pre-assessment).

Energy efficient lighting will be used throughout the refurbishment project, using suspended LED luminaires. To reduce unnecessary lighting these will be controlled through daylight-sensing, and also manually controlled, dimming. Office and WC areas will be fitted with occupancy sensing to automatically dim, or switch off, lights during periods of user absence. Manual controls will also be available to dim lighting.

Upgrade vulnerable elements

No significant changes are proposed to the existing windows to reduce any changes to the external façade and appearance of the building.

Upgrade to M&E building services

The M&E strategy is summarised below.

Major interventions are not considered appropriate for the development.

4.2.3 Mechanical and electrical strategies

The following sections summarise the M&E strategy for the refurbishment, as set out in the Design and Access Statement that accompanied the planning application.

4.2.3.1 Ventilation

The principal strategy for the building is to use natural ventilation for most areas using the existing opening windows. A small number of areas include mechanical ventilation (WC facilities) in line with Building Regulations Part F requirements.

4.2.3.2 Heating and cooling

The heating and comfort-cooling strategy makes use of a Variable Refrigerant Flow (VRF) 3-pipe heat pump/heat recovery system. This system uses internal units which provide both heating and cooling functions, and use heat recovery to maximise the energy efficiency of the overall system performance.

This technology offers an enhanced version of the commonly used multi-split system, and provides additional benefits through improved performance for zoning and occupant controls.

Owing to lack of plant space in the building, the external condenser units serving heating or cooling to the internal VRF units are located in the adjacent railway arch.

4.2.3.3 Lighting and Power

The lighting strategy for the building is to use energy efficient LED lighting with appropriate controls and zoning. The majority of additional power demand in the building will be for the operation of the VRF system and for office based ICT equipment.

4.2.4 Summary

In general, the majority of the Be Lean measures are relatively passive, seeking to represent good practice, whilst not risking the heritage status of the building. Energy savings attributable to these will be fairly modest, and the most significant benefit (in carbon terms) will be the adoption of a natural ventilation strategy, the improved efficiency gained from appropriate zoning/controls of the energy efficiency heating, cooling and lighting equipment, and the use of an electrically powered heat pump system, which should yield improved carbon savings over time as the grid continues to decarbonise, rather than locking the building into fossil fuel use.

4.3 Efficient energy supply opportunities (Be Clean)

4.3.1 Guidance

Level 2 of the energy hierarchy (**Be Clean**) focuses on identifying any potential opportunities to make use of energy supply that is more efficient that making use of national grid electricity and traditional gas combustion plant.

Two main types of opportunity are typically considered under this strategic approach:

- Connection to a local energy network, where energy generation is carried out close to where consumption takes place – providing energy efficiency by avoiding the system losses within the national distribution and transmission networks
- Using technology such as combined heat and power (CHP) to locally generate both electricity and heat – providing efficiencies by making use of the heat generated during electricity generation to heat buildings/spaces. CHP can be powered by a range of fuels: natural gas, biomass, biofuel etc.
- Using other low carbon heat supply options such as ground/air source heat pumps

These opportunities are reviewed in the following sections.

4.3.2 Review of local energy network opportunities

Camden has carried out a review of opportunities for decentralised energy in the Borough to contribute to its target of 40% carbon reduction by 2020, and has identified a number of decentralised energy priority areas in Camden[1]. The priority areas are shown in Figure 1.

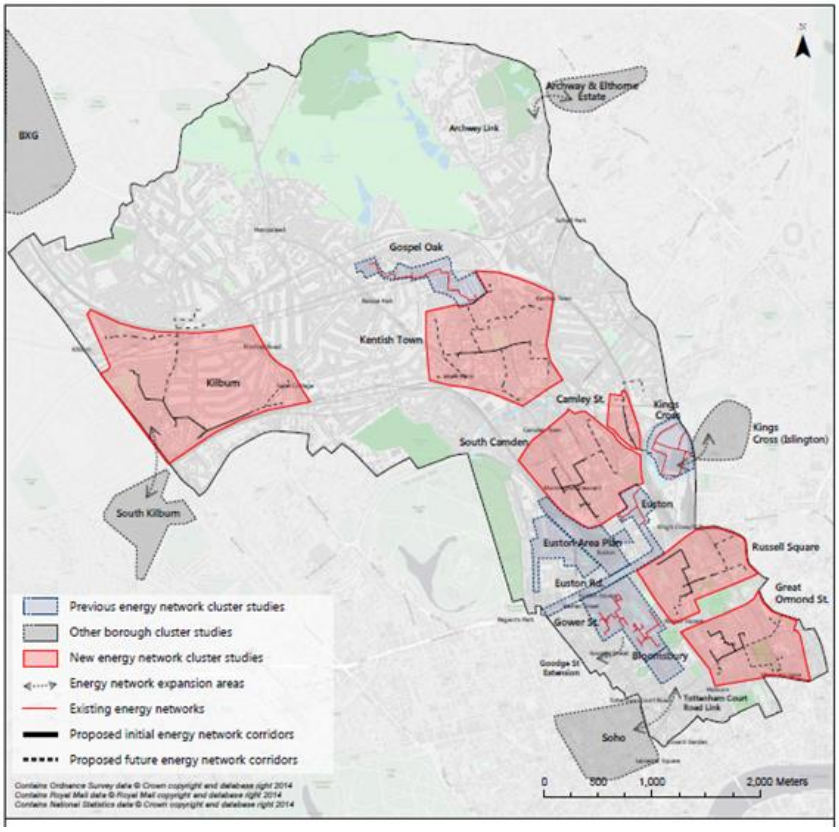

Figure 1 Priority areas for decentralised energy in Camden[2]

The location of Provender Stall is immediately adjacent to the southern area of the part of Kentish Town identified as a 'new energy network cluster study'. Kentish

[1] http://camden.gov.uk/ccm/content/environment/green/supplying-low-carbon-energy.en
[2] http://camden.gov.uk/ccm/content/environment/green/supplying-low-carbon-energy.en

Town offers the potential for a heat network due to the high density of heat demand in the area. A Kentish Town feasibility study was being discussed as a priority in 2017, but no further information on feasibility or timescales for delivery have been identified.

Given the uncertain nature of whether the Kentish Town priority area will be taken forward, the extent of any potential energy network, and timescales for it to become operational it does not provide an immediate opportunity to supply the Provender House development.

Assessment of feasibility: **Not feasible**

4.3.3 Review of CHP opportunity

Combined heat and power (CHP) is the on-site generation of electricity and utilisation of heat that is a by-product of the generation process. Due to the utilisation of heat from electricity generation, and also to the avoidance of transmission losses from centralised generation, CHP typically achieves a 30% reduction in primary energy usage compared with power stations and heat-only boilers.

There is no space to install additional plant in the basement or roof of the building, and there is insufficient space within the first floor itself for a suitable unit. Moreover, CHP engines are noisy and need acoustic treatment, all of which requires space. The building energy demand will be dominated by a need for electricity and cooling rather than heat and this mis-match in type of energy required and supplied, plus the lack of physical space means the technology has been discounted at this stage.

Assessment of feasibility: **Not feasible**

4.3.4 Ground source heat pumps

Ground source heat pumps (GSHP) can be used to extract heat or coolth from the ground by circulating a fluid through a system of pipes to a heat exchanger, which transfers heating or cooling energy to a distribution network for a building. This can provide space and domestic hot water heating or cooling. Ground source heat pumps are either open-loop, where ground water provides the cooling medium through the heat exchanger, or closed-loop, where a glycol mixture is circulated through the ground loop and absorbs heat or coolth from the ground or ground water and transfers this to the heat exchanger. Open loops are installed in boreholes and closed loops can be boreholes or laid in horizontal trenches.

In order to utilise a ground source heat pump it would be necessary to have an area of outdoor space where the ground loop(s) would be located. There is no suitable space around the building where these could be located as vertical borehole(s) or horizontally laid loops.

Assessment of feasibility: **Not feasible**

4.3.5 Air source heat pumps

Air source heat pumps (ASHP) operate on a similar basis to GSHPs. However, the system extracts heat from or rejects heat to the air around the ASHP unit, and transfers the resulting heat or coolth to the distribution network. It can be used for space heating, and also for providing a contribution to heating domestic hot water. It can also be used as a source of cooling during hot weather.

In simple terms this is the basis of the VRF heat pump system proposed for heating and cooling the refurbished floors, as described in the M&E strategy above. As the design progresses this will allow the calculations to be completed to demonstrate compliance with Part L of the building regulations. As the grid continues to decarbonise, so the carbon benefits of the heat pump system should improve.

Assessment of feasibility: **Feasible and included in the design**

Summary
Air source heat pumps offer a feasible option for providing more efficient energy for heating and cooling to the building.

4.4 Appraisal of zero carbon energy sources (Be Green)

A number of renewable energy sources have been considered for the project, as summarised below.

4.4.1 Photo-voltaic (PV) electricity generation

Photo-voltaic modules are devices, or banks of devices, that use the photovoltaic effect to generate electricity directly from sunlight. The technology is robust and widespread in the UK and around the world. Current applications in buildings include roof-mounted PV, PV curtain walling systems, and PV louvred external shading devices.

Due to listed status of the building, and its location in a Conservation Area, it has not been possible to identify a suitable location for installation of solar PV and therefore the provision of solar PV is considered not to be feasible.

4.5 Solar water heating

Solar water heating systems use energy from the sun to pre-heat domestic hot water. Solar water heating systems generally comprise solar thermal collectors and a piped fluid system to move the heat from the collector to a heat store or heat exchanger in a hot water cylinder. The system requires solar panels on the roof, ideally south facing, linked to hot water storage cylinders.

As with solar PV the output from solar thermal panels would be limited by the appropriateness of mounting panels on the outside of the building, therefore the provision of solar water heating is not feasible.

4.6 Wind power

Wind turbines use the wind's force to turn a rotor, which in turn generates electricity. Wind power is used in large scale wind farms, as well as in small mast-mounted or building-integrated turbines.

The inner city urban nature of the site means that the low quality of wind (i.e. its speed and turbulent nature) will significantly compromise the efficiency of any wind turbine. Moreover, there is no external space for a ground mounted turbine and any considerations of wind power would also be deemed unfeasible based on their impact on the local Conservation Area. For these reasons wind is discounted as a potential energy source.

4.7 Biofuels, including biomass

Biofuels and biomass heating systems combust liquid or solid biofuels in a boiler in order to heat water in the same way as gas boilers. Systems require regular fuel deliveries and require fuel to be stored and fed to the system as required.

Potentially a biofuel boiler could reduce CO_2 emissions. However, it is considered unfeasible for a number of reasons:

- The site is in a high density area, and any biofuel or biomass system would require regular deliveries of fuel, requiring areas for a delivery lorry to stop and unload and for fuel storage;
- There is no appropriate space for installation of a centralised biomass boiler, and this could not be located elsewhere in the building;
- There would be a need to identify a route for exhausting gases from the boiler, which may prove difficult within the constraints of the building.

Summary
The opportunities considered under the **Be Green** strategy are not considered feasible for the development. The target of 20% generation from on-site renewables cannot be achieved due to the constraints of the development's form, location, and heritage status.

4.8 Conclusions

In summary, there are moderate opportunities to reduce energy consumption and associated CO_2 emissions under the 'Be Lean' approach – which adopts a primary strategy of natural ventilation, backed up with improved lighting and heating/cooling systems and controls.

A review of opportunities under the ‘Be Clean’ strategic options has identified the use of air source heat pumps as the preferred approach for heating and cooling. No feasible renewable energy (Be Green) options have been identified, however, given the site constraints.

Given the Listed status of the building, and its location within a Conservation Area, opportunities to carry out measures to reduce CO_2 emissions are limited. A full assessment of the likely impact from the ‘Be Lean’ and Be Clean measures has not been carried out (to estimate CO_2 reduction from the project compared with a business as usual approach of grid electricity, gas boilers and chillers) but the review contained in this report identified few opportunities to significantly improve the thermal and energy performance of the development without placing the building’s heritage value at risk.

5 Response to CC2 Adapting to climate change

5.1 Overview

Priorities under this policy are related to climate adaptation – primarily green infrastructure, surface water management, biodiversity and overheating.

5.2 Measures employed

The limitations of the project site restrict the opportunities available to contribute positively to this policy. There is no outside space or landscaping associated with the development, which removes the opportunities for increasing green infrastructure and employing SuDS to manage surface water.

The project is a refurbishment of an existing building, however, and there is no increase in impermeable area across the development, and therefore no risk of the development actively increasing the risks from surface water flooding.

Due to its listed status, and the existing pitch roof, there are no opportunities to introduce green/brown roofs into the building.

Finally, the policy promotes use of the cooling hierarchy, which promotes the following hierarchical approach:

1. minimise internal heat generation through energy efficient design
2. reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls
3. manage the heat within the building through exposed internal thermal mass and high ceilings
4. passive ventilation
5. mechanical ventilation
6. active cooling systems (ensuring they are the lowest carbon options)

Taking these in order:

- the opportunities for energy efficient design are limited as this is a refurbishment rather than a new building project. There are no reasonable measures to improve the thermal performance of the building without jeopardising the Listed heritage status. Energy efficienct HVAC equipment and plant is being promoted
- The external façade of the building is not being changed, which removes opportunities for shading, fenestration changes etc
- Thermal mass remains exposed in the building in the form of the brick walls

- The ventilation strategy is based on natural ventilation where possible in order to minimise energy consumption from the development
- Active cooling is being used, when required, through the use of a VRF heat pump system.

5.3 BREEAM Pre-assessment

Policy CC2 sets out the requirement to produce a Sustainability Statement, and that the expectation is for developments >500m^2 to achieve BREEAM Excellent.

A BREEAM Pre-assessment is included in Section 9.

6 Response to CC3 Water and flooding

The development is located in an area of Low Flood Risk. Figure 6 of the Camden Local Plan presents a map showing areas of historic flooding, and Local Flood Risk Zones.

The development is located outside of the areas of historic flood risk, and while nearby to existing watercourses is not considered at high risk of flooding. As there is no change to the impermeable area of the site from the development it is not expected to contribute to increased risk of flooding within, or outside, the site boundary.

Water efficient fittings and appliances are expected to be used in the development and have been assumed in the BREEAM Pre-assessment to contribute to water efficiency credits.

7 Response to CC4 Air Quality

CC4 focuses on the following key aspects relating to Air Quality:

- Exposure of occupants to air pollution
- The effect of the development on air quality
- Air quality assessments for projects expected to expose residents to high levels of pollution
- Assessment of the risk of dust and emissions for projects involving demolition, construction or earthworks

The project uses natural ventilation, through openable windows, to provide fresh air to occupants. The Design and Access statement confirms that the plans have been presented to, and discussed with, an Approved Inspector with relation to ventilation for the building.

A detailed analysis of local air quality has not been carried out, but the air pollution map provided by Camden council has been consulted[3]. This demonstrates that NO_2 concentrations are elevated along the length of Chalk Farm Road and Hawley Road, but that these rapidly reduce to <40 µg/m3 at a set back from the road.

The project building is set back a minimum of 10m from Chalk Farm Road, increasing to around 40m at the western end. Occupants will be located above the ground floor (where air pollution is typically at its worst, and where monitoring is carried out). In addition, it is not expected that the occupants of the development will generally be those most at risk for air pollution, i.e. children and the elderly.

While these factors do not remove the potential risk from air pollution, they do mitigate it to a degree. Further mitigation of health risks can be achieved by providing information and guidance to building users on the health risks from air pollution, and by providing updates on current air quality levels during peak periods.

Camden's Clean Air Action Plan 2016-2018 provides detail on the risks to air quality arising from new development, but it is not expected that the development will significantly contribute to these:

- During construction phase there is no demolition activity, and construction-stage impacts are expected to be limited to increased construction-related traffic. This is expected to be minor.
- During operation the emissions from the building itself will be minimal – space heating is provided by the electrically powered VRF heat pump system, not locally burnt fossil fuels.
- The development is extremely well supported by public transport options through proximity to London Underground and bus networks. There is also provision for cycle storage in the vicinity of the development.

On this basis the development is not expected to contribute significant pollution to the local area.

8 Response to CC5 Waste

CC5 sets out the policies to support Camden being a low waste borough. It focuses on reducing waste and resource consumption throughout the construction and operation of new development.

As the development is a refurbishment and change of use there will be no significant demolition or excavation waste. Construction waste will be minimal as the project is an internal fit-out only, but will be actively managed during construction process in line with the requirements of BREEAM, which requires a Site Waste Management Plan to be developed and implemented.

[3] https://www.camden.gov.uk/ccm/content/environment/air-quality-and-pollution/air-quality/twocolumn/air-pollution-maps/?source=rndm

Operational waste generation is expected to be minimal given the type of new building use – there are no significant waste generation activities being carried out on site as it is mainly operating as office space.

In line with BREEAM requirements there will be adequate provision of internal waste storage to allow for sorting and storage of recyclable waste streams.

9 Sustainability Statement

9.1 Sustainability statement

The Local Plan specifies BREEAM as an appropriate sustainability assessment tool for non-domestic projects. In addition to broader sustainability priorities under CC1-CC5 the Local Plan encourages developments to achieve BREEAM Excellent.

CPG3 also provides a broader approach to how projects should consider sustainability within the proposed development, and prioritises the following themes:

- Energy (covered above in the Energy Statement)
- Water efficiency
- Sustainable use of materials
- Brown roofs, green roofs and green walls
- Flooding
- Climate Change adaptation
- Biodiversity
- Local food growing

With the exception of local food growing these themes are addressed through the credits within a BREEAM Assessment, and the approach taken in this Sustainability Statement has been to review and identify the opportunities to meet the targets within CPG3 of:

- BREEAM Excellent
- Achieving 60% of the un-weighted credits in the BREEAM Energy category
- Achieving 60% of the un-weighted credits in the BREEAM Water category

9.2 BREEAM Pre-assessment

This BREEAM Pre-assessment has been carried out based on information provided by the developer, and contained in the planning application. It does not constitute a formal assessment, but instead acts to demonstrate the potential of the development to achieve a BREEAM certification, and the magnitude of effort required.

The Pre-Assessment has been produced by Keith Robertson, who is a licensed BREEAM Assessor[4].

The Pre-Assessment is based on BREEAM UK Refurbishment and Fit-out 2014 using the Technical Manual version *SD215 1.1 – 2014.* This version of BREEAM

adopts a flexible/modular approach for refurbishment projects. For this project all four modules are included:

- Part 1 Fabric and Structure
- Part 2 Core Services
- Part 3 Local Services
- Part 4 Internal Design

Due to the simplicity and scale of the redevelopment the project will fall under the 'Simple Building' methodology.

The assessment also allows for the status of the building as Grade II Listed.

BREEAM Excellent requires a score of ≥ 70% and requires a number of minimum standards to be met for:

- Man 03: Responsible construction practices
- Man 04: Commissioning and handover
- Man 05: Aftercare
- Ene 01: Reduction of energy use and carbon emissions
- Ene 02: Energy monitoring
- Wat 01: Water consumption
- Wat 02: Water monitoring
- Mat 03: Responsible sourcing of materials
- Wst 03: Operational waste

9.2.1 Pre-assessment results:

A Pre-assessment was carried out through the BRE's Project system. The automatically generated report is included in Appendix A.

The summary of the assessment is provided in Figure 2:

BREEAM rating

BREEAM Rating					
	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	12.0	10.0	83.33%	11.47%	9.55%
Hea	14.0	9.0	64.29%	15.96%	10.26%
Ene	20.0	10.0	50.00%	19.26%	9.62%
Tra	6.0	4.0	66.67%	6.69%	4.45%
Wat	8.0	6.0	75.00%	8.92%	6.68%
Mat	12.0	8.0	66.67%	19.30%	12.86%
Wst	9.0	8.0	88.89%	9.41%	8.36%
Le	0.0	0.0	0.00%	0.00%	0.00%
Pol	7.0	3.0	42.86%	9.00%	3.85%
Inn	10.0	5.0	50.00%	10.00%	5.00%
Total	98.0	63.0	64.29%	-	70.67%
Rating	-	-	-	-	Excellent

Figure 2 Summary of BREEAM Pre-assessment

The assessment is based on information provided as part of the planning application and in discussion with the M&E consultants for the project. The assessment makes a number of assumptions about the levels of performance required during construction stage and these should be reviewed and understood by the developer.

As the design develops, the conclusions drawn here about credits are likely to change and it is important for the design team and BREEAM assessor to work closely together to ensure the Target BREEAM rating is achieved. This might require, for example, investigation of opportunities to achieve Innovation credits to close the gap to the required level.

Further analysis is required to fully understand the energy performance of the building. The score has been assumed to deliver 7 out of a possible 15 credits for Ene 01 – but this requires further validation through appropriate energy modelling.

The expected water credit performance must also be reviewed in light of specified fittings etc – which may need to be improved to achieve the estimated target within the pre-assessment.

9.2.2 Pre-assessment conclusions

The target of BREEAM Excellent appears achievable, although further work is required to determine if the energy credits can be achieved, and additional credits may be required (through Innovation) if this is not the case.

On the basis of the pre-assessment it is feasible for the project to achieve LBC's requirements on Water, however at present the project falls short of the 60% aspiration for un-weighted Energy credits. This is understood to be due to the limitations of the building, and its Listed Status – which reduces the feasibility of certain energy strategies that could deliver additional performance benefits.

9.3 Resource efficiency

The Local Plan notes that developments in excess of 500m^2 floor area should carry out an assessment of embodied carbon within the development. This has not been carried out for Provender Stall as it is considered of limited use because:

- As the development is a refurbishment project the embodied emissions from building materials will be low compared to other building and project types
- The intention of the planning policy is to broaden the evidence base on embodied carbon in building projects. As the building is of Listed status, the measures included in the design are not expected to be representative of wider types of project, and therefore the case study would be of limited value.

Appendix A

BREEAM Pre-assessment Report

BREEAM®

Code for a Sustainable Built Environment
www.breeam.com

BREEAM UK Refurbishment & Fit-out 2014 - Pre-assessment

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Pre-assessment

11 May 2018 Assessment Report

PwC's BREEAM Outstanding rated One Embankment Place in London. Image Hofton + Crow.

bre

Assessment details

Assessment references

Registration number:	Provender Stall	**Date created:**	10/5/2018
Created by:	Keith Robertson		
Architect name:			
Developer name:	Castlehaven Row Ltd		
Property owner			

Site details

Site name:

Address:

Town:

County:

Post code:

Country:

Certificate details

The certificate will have the name of the architect (if entered above) and the name of the developer (from above).

Any other names to appear on the certificate are listed below:

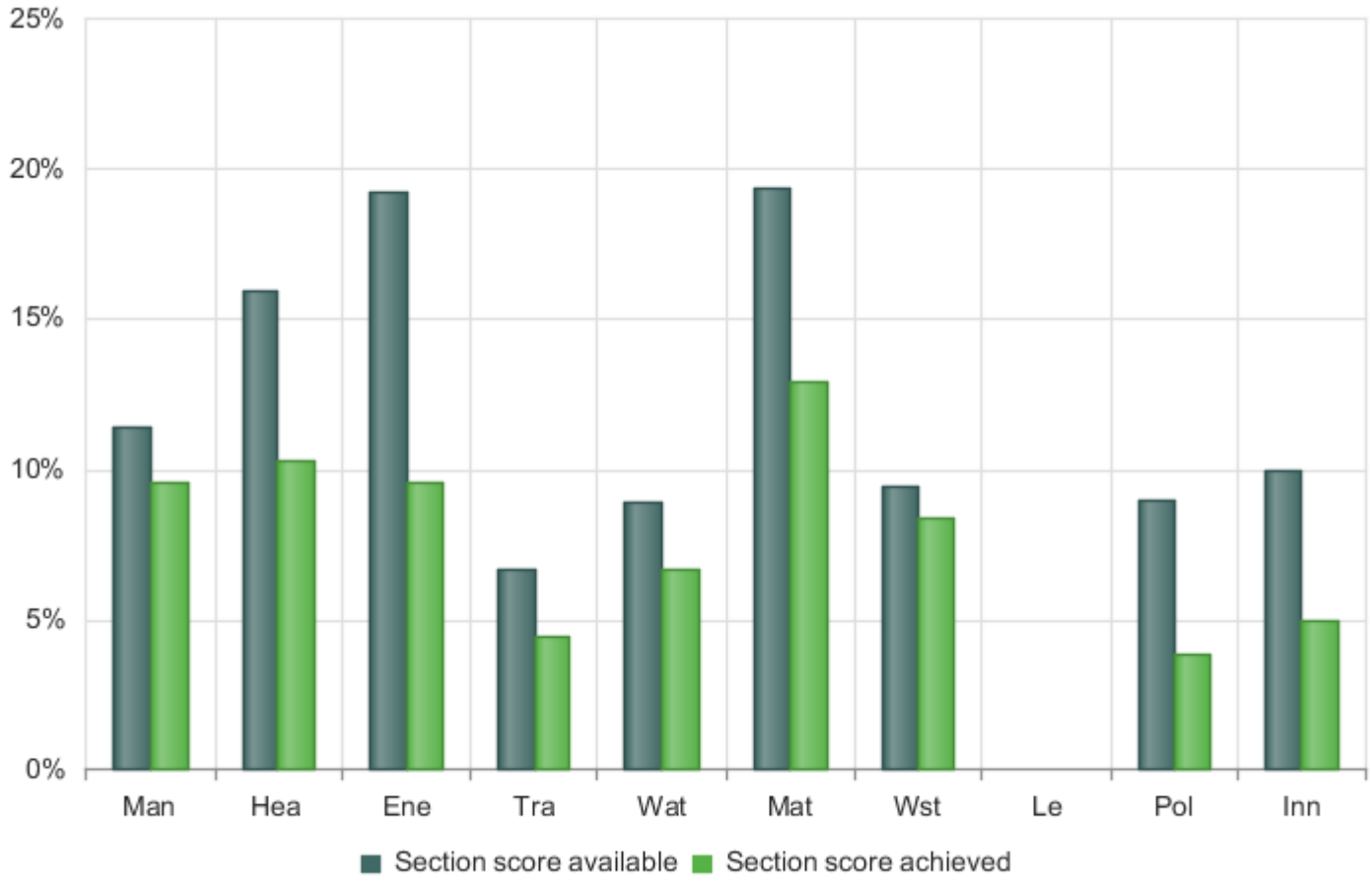
Name	Label

BREEAM rating

BREEAM Rating

	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	12.0	10.0	83.33%	11.47%	9.55%
Hea	14.0	9.0	64.29%	15.96%	10.26%
Ene	20.0	10.0	50.00%	19.26%	9.62%
Tra	6.0	4.0	66.67%	6.69%	4.45%
Wat	8.0	6.0	75.00%	8.92%	6.68%
Mat	12.0	8.0	66.67%	19.30%	12.86%
Wst	9.0	8.0	88.89%	9.41%	8.36%
Le	0.0	0.0	0.00%	0.00%	0.00%
Pol	7.0	3.0	42.86%	9.00%	3.85%
Inn	10.0	5.0	50.00%	10.00%	5.00%
Total	98.0	63.0	64.29%	-	70.67%
Rating	-	-	-	-	Excellent

Performance by environmental category



Issue scores

Please Note: X means the exemplary credit for the relevant issue

Management

Man 01	Man 01X	Man 02	Man 03	Man 03X	Man 04	Man 05	Man 05X
0	2	1	4	1	2	3	1

Health and Wellbeing

Hea 01	Hea 01X	Hea 02	Hea 03	Hea 04	Hea 05	Hea 06
4	0	1	N/A	3	N/A	1

Energy

Ene 01	Ene 01X	Ene 02	Ene 03	Ene 04	Ene 05	Ene 06	Ene 07	Ene 08	Ene 09
7	0	2	N/A	1	N/A	N/A	N/A	N/A	N/A

Transport

Tra 01	Tra 02	Tra 03	Tra 04	Tra 05
3	1	0	N/A	N/A

Water

Wat 01	Wat 01X	Wat 02	Wat 03	Wat 04
3	0	1	2	N/A

Materials

Mat 01	Mat 01X	Mat 03	Mat 03X	Mat 04	Mat 05	Mat 06
3	0	3	0	N/A	1	1

Waste

Wst 01	Wst 01X	Wst 02	Wst 02X	Wst 03	Wst 04	Wst 05	Wst 05X	Wst 06
3	0	1	0	1	1	1	1	1

Land use and ecology

Le 2	Le 4	Le 5
N/A	N/A	N/A

Pollution

Pol 01	Pol 02	Pol 03	Pol 03X	Pol 04	Pol 05
N/A	0	3	0	N/A	N/A

Innovation

Inn 01	Inn 01X
N/A	0

Initial details

Stage 1 filtering: Scope of the assessment

Part 1 : Fabric and structure : Yes

Part 2 : Core services : Yes

Part 3 : Local services : Yes

Part 4 : Interior design : Yes

Stage 2 filtering: Project specific filtering

Is the project a change of use? (e.g. change from office to a hotel) : Yes

Are transportation systems specified or present within the refurbishment or fit-out zone? (lifts, escalators, moving walks) : No

Are there laboratories present and if so what % of total building area do they represent : No laboratories present

Project Type : Change of use

Laboratory containment area : No laboratories present

Is cold storage specified or present within the refurbishment or fit-out zone? : No

Are there new or existing landscaping areas within the refurbishment or fit-out zone and within developer control? : No

Are there any external areas within the refurbishment or fit-out zone and within developer control that can feasibly be enhanced in line with LE 04 : No

If the asset undergoing refurbishment or fit-out is part of a larger building, is the cooling generation plant centralised or localised? : N/A

If the asset undergoing refurbishment or fit-out is part of a larger building, is the heating generation plant centralised or localised? : N/A

Is Wat01 within the scope of the assessment in accordance with Table 42? : Yes

What is the building type? : Offices

Is this a speculative refurbishment? : No

If Industrial, does the building have office areas? : N/A

Does the building have or mitigate any unregulated water demand? e.g. irrigation or soft-landscaped areas requiring no irrigation, car washing, other significant process related : No

Does the building have unregulated energy demands from significantly contributing systems? : No

Is the project a simple building? : Yes

Does the building have external lighting within the scope of works? : No

Does the building have any existing or newly specified externally mounted plant? : No

If undertaking a Part 4 assessment, is there any equipment specified that requires commissioning (see Man04 CN13) : No

Historic building (listed building or building in a conservation area) : Yes, grade 2 listed (England or Wales)

Is any new insulation specified? : No

Category assessment

Management | Man

Man Management

Site :

MAN 01 PROJECT BRIEF AND DESIGN	
Stakeholder consultation (project delivery) :	0
Stakeholder consultation (third party) :	0
Exemplary level criteria :	
Sustainability champion (design) :	1
Sustainability champion (monitoring progress) :	1
MAN 02 LIFECYCLE COST AND SERVICE LIFE PLANNING	
Capital cost reporting :	1
MAN 03 RESPONSIBLE CONSTRUCTION PRACTICES	
Is all timber used in the project 'legally harvested and traded timber'? :	Yes
Environmental management :	1
Considerate construction :	2
Exemplary level criteria :	Yes
Has the project achieve the minimum standard for an Excellent or Outstanding rating? :	Minimum standard for Excellent rating
Monitoring of refurbishment or fit-out site impacts :	1
Utility consumption :	Yes
Transport of construction materials and waste :	Yes
MAN 04 COMMISSIONING AND HANDOVER	
Commissioning and testing schedule and responsibilities :	1
Handover :	1
Has criterion 9 been met? :	Yes
MAN 05 AFTERCARE	
Aftercare support :	1
Exemplary level criteria :	Yes
Seasonal commissioning :	1
Post occupancy evaluation :	1

Credits awarded : 10.0
Exemplary credits awarded : 4.0

Comments :
A full review of prior consultation has not been carried out, and a cautious approach to assessing this credit has been taken.
A sustainability champion will be identified for the project.
Highest levels of Responsible Construction Practices will be achieved.
Commissioning and aftercare credits will be achieved in full.

Health and Wellbeing | Hea

Hea Health & Wellbeing

Site :

HEA 01 VISUAL COMFORT	
Glare control :	1
Daylighting :	1
Exemplary level criteria :	No
View out :	1
Internal and external lighting :	1
HEA 02 INDOOR AIR QUALITY	
Ventilation :	0
Volatile organic compounds :	1
Potential for natural ventilation :	0
HEA 03 SAFE CONTAINMENT IN LABORATORIES - NA	
HEA 04 THERMAL COMFORT	
Thermal modelling :	1
Adaptation - for a projected climate change scenario :	1
Thermal zoning and controls :	1
HEA 05 ACOUSTIC PERFORMANCE - NA	
HEA 06 SAFETY AND SECURITY	
Security of site and building :	1
Credits awarded : 9.0	

Comments :
Glare Control will be specified for the development.
Daylighting has not been modelled, but based on the glazing proportion and floorplan this is expected to achieve 1 credit.
The building is 8m wide, and full View Out credits expected to be achieved due to overall proximity of locations to windows.
Natural Ventilation credits are unlikely to be achieved - while natural ventilation is being used the development is expected to be too close to point of outdoor pollution (e.g. roads / car parks) to fully satisfy these criteria.
Thermal modelling is still to be carried out, but is expected to deliver the appropriate levels of comfort for this credit.
An SQSS will be consulted.

Energy | Ene

Ene Energy

Site :

ENE 01 ASSESSMENT OPTION

Which option is being followed :	Option 1a simple estimate (whole building)

ENE 01 - OPTION 1A

Credits :	7
Exemplary credits :	0

ENE 02 ENERGY MONITORING

Sub-metering of major energy consuming systems :	1
Sub-metering of high energy load and tenancy areas :	1

ENE 03 EXTERNAL LIGHTING

ENE 04 LOW CARBON DESIGN

Passive design analysis :	0
Free cooling :	0
Low and zero carbon technologies :	1

ENE 05 ENERGY EFFICIENT COLD STORAGE - NA

ENE 06 ENERGY EFFICIENT TRANSPORTATION SYSTEMS - NA

ENE 07 ENERGY EFFICIENT LABORATORY SYSTEMS - NOTAPPLICABLE

ENE 08 ENERGY EFFICIENT EQUIPMENT

ENE 09 DRYING SPACE

Credits awarded : 10.0

Comments :
An energy model has not yet been developed. An estimated 7 credits will be achieved.
Credits available: 20.
Expected credits achieved: 10
While this does not demonstrate compliance with LBC target of 60% of available Energy credits this is largely due to the limitations on energy strategy due to the Listed Status of the development.

Transport | Tra

Tra Transport

Site :

TRA 01 SUSTAINABLE TRANSPORT SOLUTIONS

Sustainable transport options :	3

TRA 02 PROXIMITY TO AMENITIES

Proximity to amenities :	1

TRA 03 CYCLIST FACILITIES

Cycle storage :	0
Cylist facilities :	0

TRA 04 MAXIMUM CAR PARKING CAPACITY - NA

TRA 05 TRAVEL PLAN

Credits awarded : 4.0

Comments :
Due to location the development scores well on public transport access and proximity to amenities.
No on-site cycle facilities are being provided.

Water | Wat

Wat Water

Site :

WAT 01 WATER CONSUMPTION

Water consumption :	3
Exemplary level criteria :	No

WAT 02 WATER MONITORING

Water monitoring :	1
Has criterion 1 been met? :	Yes

WAT 03 LEAK DETECTION

Leak detection system :	1
Flow control devices :	1

WAT 04 WATER EFFICIENT EQUIPMENT - NA

Credits awarded : 6.0

Comments :
A moderate level of water efficiency measures has been assumed.
Measures to manage and reduce the risk of leaks will be included.
This achieves the LBC requirement for 60% of unweighted water credits to be secured. On the basis of points above 75% of unweighted credits are expected to be achieved.

Materials | Mat

Mat Materials

Site :

MAT 01 ENVIRONMENTAL IMPACT OF MATERIALS

Options :	Option 2
Environmental impact of materials :	3
Exemplary level criteria :	No

MAT 03 RESPONSIBLE SOURCING OF MATERIALS

Sustainable procurement plan :	1
Has criterion 1 been met? :	Yes
Responsible sourcing of materials :	2
Exemplary level criteria :	No

MAT 04 INSULATION

MAT 05 DESIGNING FOR DURABILITY AND RESILIENCE

Designing for durability and resilience :	1

MAT 06 MATERIAL EFFICIENCY

Material efficiency :	1

Credits awarded : 8.0

Comments :
The assessment benefits from the in-situ materials of the Listed structure. Responsible sourcing certificated products will be sought for all internal fittings/fixtures.

Waste | Wst

Wst Waste

Site :

WST 01 CONSTRUCTION WASTE MANAGEMENT

Pre-refurbishment audit :	1
Re-use and direct recycling of materials :	1
Diversion of waste from landfill :	1
Exemplary level criteria :	No

WST 02 RECYCLED AGGREGATES

Recycled aggregates :	1
Exemplary level criteria :	

WST 03 OPERATIONAL WASTE

Operational waste :	1

WST 04 SPECULATIVE FINISHES

Speculative finishes :	1

WST 05 ADAPTATION TO CLIMATE CHANGE

Adaptation to climate change - structural and fabric resilience :	1
Exemplary criteria: Responding to adaptation to climate change :	Yes

WST 06 FUNCTIONAL ADAPTABILITY

Functional adaptabiliy :	1

Credits awarded : 8.0
Exemplary credits awarded : 1.0

Comments :
The development will perform well as the refurbishment of materials is minor and levels of waste will be low.
A waste strategy for operational period would be beneficial, to understand the types and volumes of waste streams expected and appropriate facilities to encourage recycling in this context.
The project also benefits from being inherently functionally adaptable and score well in this area.

Land use and ecology | Le

Le Land use and ecology

Site :

LE 02 PROTECTION OF ECOLOGICAL FEATURES - NA

LE 04 ECOLOGICAL ENHANCEMENT - NA

LE 05 LONG TERM IMPACT ON BIODIVERSITY - NA

Credits awarded : 0.0

Comments :
Because of the limited external areas of the development these criteria are N/A.

Pollution | Pol

Pol Pollution

Site :

POL 01 IMPACT OF REFRIGERANTS

POL 02 NOX EMISSIONS

NOx emissions :	0

POL 03 FLOOD RISK AND REDUCING SURFACE WATER RUN-OFF

Flood risk management :	2
Exemplary level criteria :	No
Surface water run-off :	1
Minimising watercourse pollution :	0

POL 04 REDUCTION OF NIGHT TIME LIGHT POLLUTION

POL 05 NOISE ATTENUATION

Credits awarded : 3.0

Comments :
The project relies on grid electricity and will not achieve NOx credits.
The development is located in an area at low risk of flooding and achieves credits by the nature of its location.
A surface water run-off assessment has not been carried out - but these are challenging credits to achieve and have therefore not been assumed as achievable.