

# Environmental Sustainability Plan

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## Building R3 and Zone R Gardens

King's Cross Central  
General Partner Ltd

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August 2015

**King's Cross**

# Contacts

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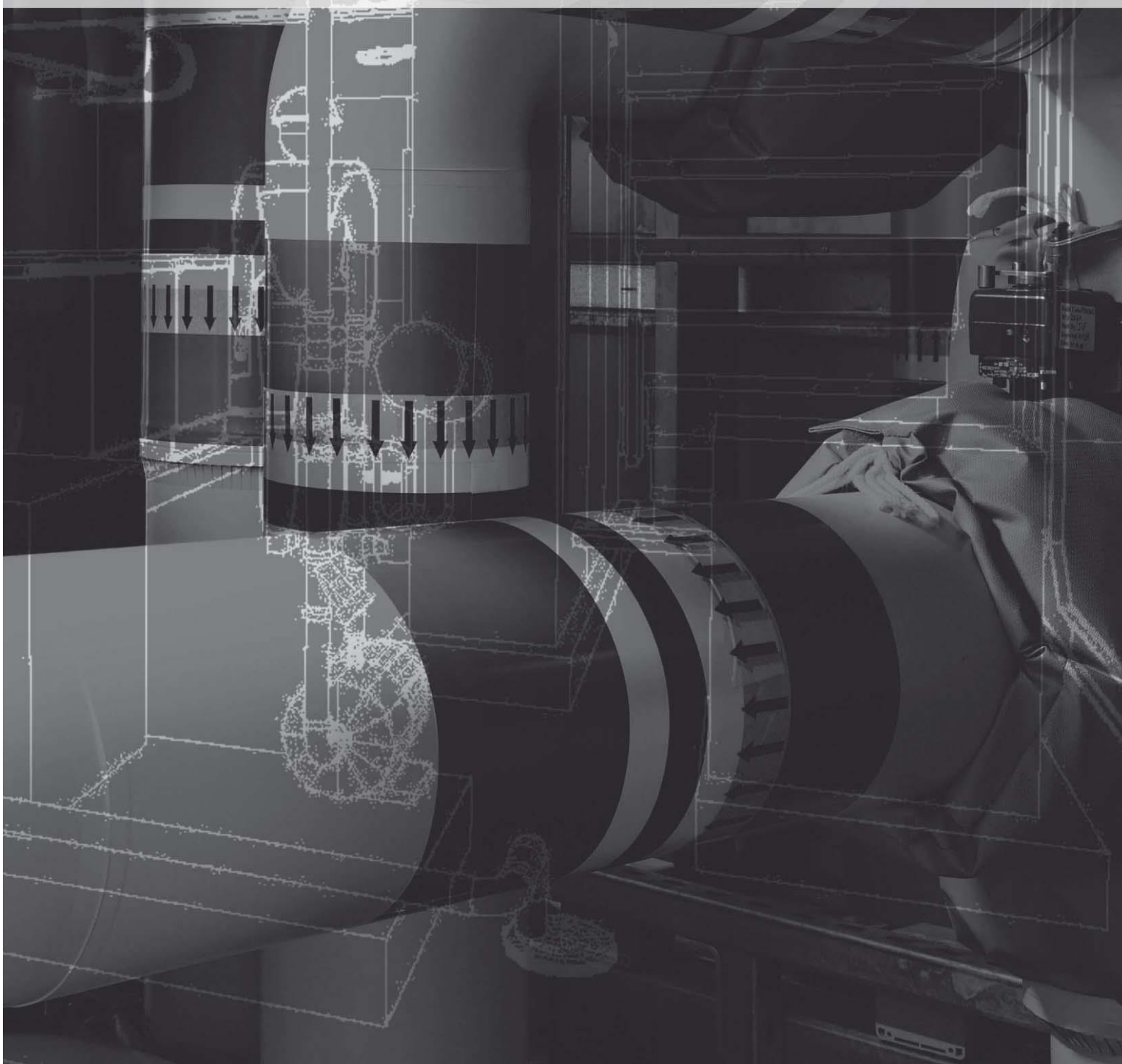
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# King's Cross Central Environmental Sustainability Plan Building R3

King's Cross Central General Partner Ltd  
July 2015



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# 1 Executive Summary

This Environmental Sustainability Plan has been prepared to explain the contribution that the proposed development of Plot R3 will make to the sustainable development of the King's Cross Central ('KXC') site.

Specifically, this document addresses the relevant planning conditions of the KXC Outline Planning Permission (the Outline Planning Permission ref. 2004/2307/P) of 22 December 2006 and the associated Section 106 Agreement obligations relating to sustainability and highlights how the project team have responded to these conditions.

Building R3 will be a predominantly residential building located in the north-east of the KXC development site. It has been designed to achieve a very high standard of sustainability, with steps identified to achieve a target of Code for Sustainable Homes Level 4 for the residential dwellings. The combination of energy efficient measures and the sourcing of heat and power from the low-carbon district energy system result in an overall annual carbon reduction of 38% relative to the current 2013 Part L target emission rate (TER), which represents an emissions saving of at least 27.8 tonnes CO<sub>2</sub>/ year.

In summary, the main measures that are proposed in order to meet the requirements of the Outline Planning Permission and Code for Sustainable Homes level 4 are, but are not limited to, the following:

## Condition 17(A) Energy efficiency measures

The approach to reducing energy consumption and carbon emissions has followed the energy hierarchy, from passive design, energy efficiency, and incorporation of low-carbon district energy, which will result in significant regulated CO<sub>2</sub> emissions reductions relative to Building Regulations Part L 2013 compliance levels.

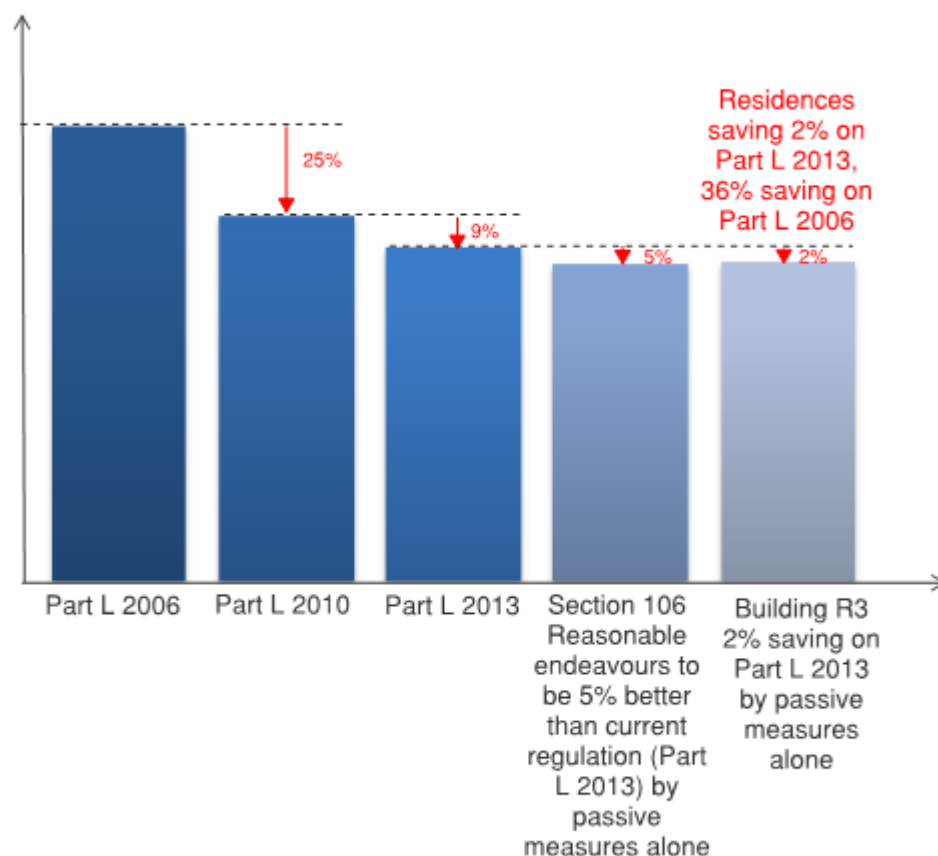
- The scheme utilises the building fabric to deliver low-energy buildings: passive design measures include overhanging balconies to the East and West to protect dwellings from summer solar gains. Glazing on the North façade is limited to reduce heat loss from the apartments and on the South façade to reduce solar gains. The building has been designed with optimised proportions of glazed and opaque areas to allow beneficial winter solar gains, avoid excessive summer solar gains and maximise daylight levels.
- High envelope performance will be achieved through the use of high specification glazing, high levels of insulation, and very good airtightness levels, all of which reflect best practice whilst addressing the construction methodology.
- The residential apartments will be provided with an efficient whole house ventilation system with heat recovery and summer bypass, ensuring efficient and adequate ventilation levels. All apartments will also benefit from openable windows for additional occupant control over the internal environment.
- All areas, including the dwellings, residential amenity facilities, and commercial areas, will be served by the district heating scheme. In the apartments, this will be delivered via Heat Interface Units (HIU), and individual storage cylinders where required.
- Intelligent low energy lighting will be specified throughout the residences.
- Apartments and commercial units will be separately metered for heat and electricity to encourage energy efficiency in operation. The apartments will also be provided with energy display devices, recording energy consumption and promoting efficient behaviour.
- The residential units will have programmable controls to maintain comfort conditions.

### Condition 17(B) Reduction in carbon emissions

Building R3 is subject to Building Regulations Part L 2013. Previous KXC schemes have been assessed under Part L 2006 and recently Part L 2010. Therefore they have been subject to less onerous carbon reduction targets.

The residential units will comply with Part L1A 2013 from passive design and energy efficiency alone (i.e. prior to the contribution of the low-carbon supply and renewable energy measures). Currently, preliminary Part L 2013 calculations carried out on a large sample of residential units predict that this could be achieved, with a significant improvement of 2%. This would equate to 11% compared to Part L 2010 and 36% when compared to Part L 2006.

The passive design and energy efficiency carbon reduction measures adopted into building R3 have achieved a marked improvement over the current 2013 building regulations. Part L 2013 is at the forefront of energy efficiency for residential apartment buildings and is significantly more onerous than the regulations at the time of the Section 106 agreement, as such a reduction of 2% on this target is a considerable achievement. The delivery of considerable carbon emissions savings is illustrated in the following figure.

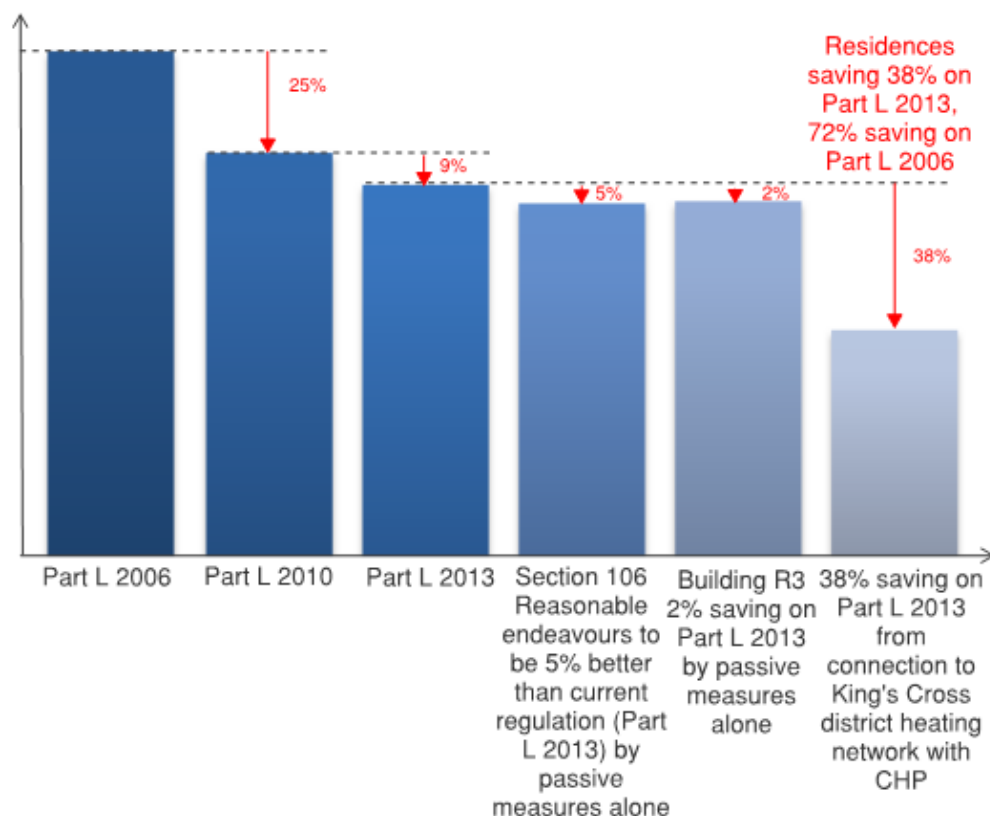


### Condition 17(C): Provision of Green roofs

- An extensive green roof incorporating 100% vegetation will be provided on the roof areas of Building R3 as indicated on the architects layouts.
- Private roof terraces for use by residents will be provided at levels 8 and 11.
- Taking all of these roof types into account, 66% of the total roof area of Building R3 will be either green roof or landscaped terraces.

### Condition 17(D): Energy supply

- The connection of Building R3 to the district energy supply system shall allow it to take advantage of the low-carbon benefits associated with combined heat and power. The district energy system will meet all of the heat and hot water demand for the building. It will also generate electrical power which will be sold, thereby offsetting a significant percentage of the buildings' demand.
- The use of a low-carbon energy supply and the aforementioned passive design measures result in Building R3 achieving an overall reduction in CO<sub>2</sub> of 38% against the Part L 2013 TER, which would be around 72% better than Part L 2006, the current energy regulation when the Section 106 agreement was drafted.



### Condition 17(E): Code for Sustainable Homes and BREEAM Multi-Residential

- A pre-assessment of the Code for Sustainable Homes criteria has been carried out for the residential accommodation, which has identified an indicative score of 69.21% equating to a Level 4 rating.
- A number of additional credits have been identified which could see the score increased to 75.1% during detailed design and construction.



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**Condition 45: Drainage**

- Plot R3 is serviced by the Eastern Goods Yard drainage systems and discharges via a restricted discharge in to the combined Thames Water Camden 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).
- R3 has been designed so that these discharges will not be exceeded and that the site wide maximum discharge into the existing combined sewer will not exceed 2292l/s.

**S106 - Section AA: Water**

- Low water use sanitary ware and appliances will be specified such that internal water use will be less than 105 litres/person/day.

**S106 - Section Y: Construction materials and waste**

- Implementation of the Construction Materials and Purchasing Strategy.
- Packaging used to protect construction materials and assemblies in transportation will be kept to a minimum and wherever possible returned to be re-used.
- In addition to Section 106 requirements, the project contractor may have its own corporate construction targets which will be applied to the proposed development.
- Maximum credits under the 'Code for Sustainable Homes' for *Man 3* Construction site impacts have been targeted, which includes monitoring and reducing resource use and waste production.

**S106 - Section Z: Waste**

- A simple 'home user' guide will include information on waste and recycling.
- Dedicated storage space and containers will be provided within each dwelling to encourage occupants to recycle.
- Sufficient communal refuse storage space will be provided.

## 2 Introduction

### 2.1 PURPOSE OF THE PLAN

This Environmental Sustainability Plan describes the environmental strategies that have been included within the design of Building R3 in response to the planning conditions of the King's Cross Central (KXC) outline planning permission dated 22 December 2006 (the Outline Planning Permission). In particular, this document provides information in response to Conditions 17, 40 and 40 of the permission, giving details of the strategies adopted and demonstrating that the proposed scheme achieves a very high standard of sustainability for buildings of this scale in an urban environment. The plan also details how obligations contained within sections AA, Y and Z of the Section 106 Agreement will be met.

This document should be read in the context of other plans and documents forming the Building R3 submission, including the Planning Compliance Report, the Urban Design Report and the *Code for Sustainable Homes* pre-assessment, the latter being included within this document at Appendix C.

### 2.2 DESCRIPTION OF BUILDING R3

The site is located on the western edge of Development Zone R, in the northern half of the KXC development. The location of Building R3, Zone R Gardens and the Reserved Matters submission boundary are shown in Figure 1 below. The plot is surrounded by Plots R5 South to the north, R8 to the east, R1 to the south and Cubitt Park to the west.

The proposed building will comprise ground plus 7-10 storeys of residential accommodation at upper floors, with a large reception area and two retail units at ground floor.

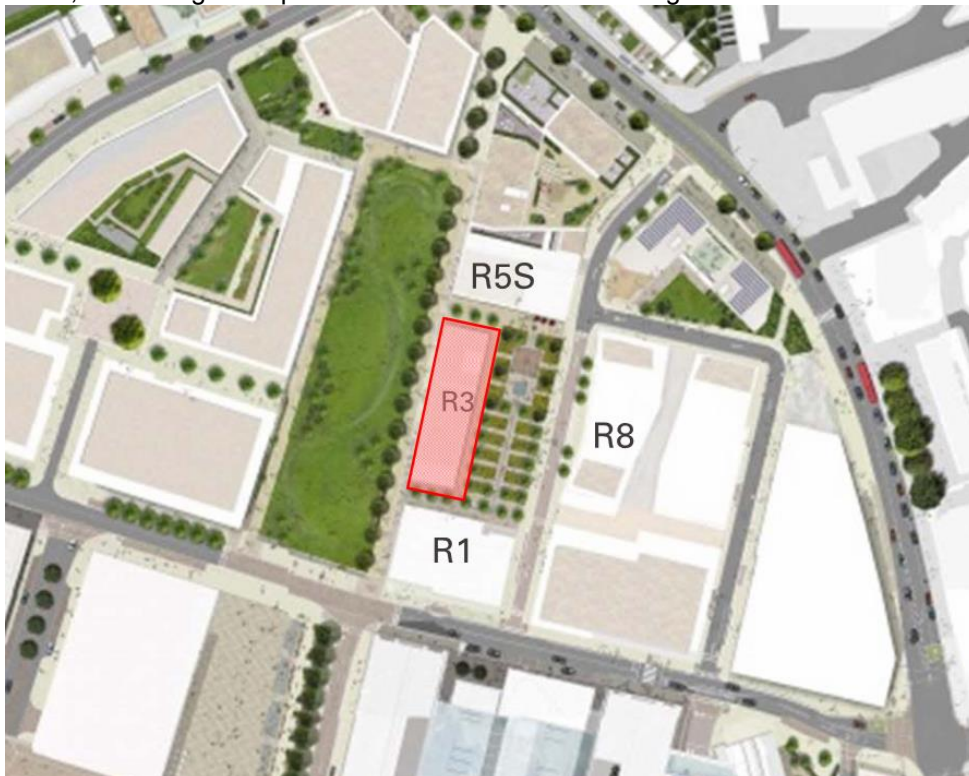


Fig 1: Indicative KXC Master Plan showing Building R3 highlighted in red



The proposals for Building R3 will deliver a highly sustainable urban scheme that meets the environmental, social and economic needs of the local community. It has been designed in close co-operation with London Borough of Camden (LBC) officers to address the relevant conditions from the Outline Planning Permission and obligations under the associated Section 106 Agreement.

In addition to its connection to the low-carbon KXC district energy system, the proposed development has been designed to include a number of 'passive design' measures that will minimise energy consumption, provide a high quality living environment and reduce reliance on mechanical and electrical systems. The key activities and measures are described in the following sections of this Environmental Sustainability Plan.

## 3 Responses to Planning Conditions

### 3.1 **CONDITION 17 (A): ENERGY EFFICIENCY MEASURES**

*'Explain how the proposed building design realises opportunities to include design and technology energy efficiency measures.'*

#### 3.1.1 **Overview**

As described in Section 2.2, Building R3 comprises predominantly residential uses, with two commercial units at ground floor and one level of basement primarily for bicycle storage and plant room and other ancillary spaces. In terms of occupied and habitable space it is the residential users who will have the largest impact on the building's energy consumption. The measures described in this section relate to the scheme's energy performance as a whole, however, mainly focus on the residential element of the building.

The building has been designed from the outset with energy efficiency as a key driver. Whilst power, heating and hot water supplies will be provided via the low-carbon district energy system, expected energy demand has been reduced through the application of the following energy hierarchy:

- Passive Design – design of the building façade and specification of a high-performance envelope. A well-designed external envelope can significantly reduce energy demand, and the need to reduce space heating demand, optimise daylight, and control summer solar gains has had a strong influence upon the design of the buildings and their facades.
- Active Design - energy efficient equipment and controls to reduce energy consumption. This passive approach also helps 'future-proof' the building and provide resilience to climate change impacts to continue meeting the future operational needs of the occupants.

#### 3.1.2 **Physical form of the building**

As explained previously, Plot R3 is located in the north-east of the KXC redevelopment site. The plot will be bounded by Cubitt Park to the west and the 'Zone R Gardens' to the east. Neighbouring developments include R5 South and R1 to the north and south respectively.

The central axis of the block runs in a north-south direction, so that the majority of rooms face east or west and each overlooks one of the parks with no buildings in close proximity to obstruct the daylight. Of the 61 apartments, 31 (52%) are dual aspect to maximise the daylight within the apartments. The orientation of the building is such that there are no apartments with exclusively north facing windows.

Passive design measures include overhanging balconies to the east and west to protect dwellings from summer solar gains. Glazing on the north façade is limited to reduce heat loss from the apartments and on the south façade to reduce excessive solar gains. The building has been designed with optimised proportions of glazed and opaque areas to allow beneficial winter solar gains, avoid excessive summer solar gains and maximise daylight levels.

A full description of the Building R3 scheme is provided in the separate Urban Design Report produced by Squires and Partners, Tom Stuart Smith and Townsend Landscape Architects (TLA).

### 3.1.3 Building envelope, specification and thermal performance

The external envelope can act as an important climatic modifier. A well-designed external envelope can significantly reduce energy demand. The need to address thermal comfort issues in summer, while minimising the use of mechanical cooling, has had a strong influence upon the design of Building R3.

The building fabric performance in terms of the specified glazing standard and insulation levels will exceed the requirements of Part L of the Building Regulations 2013. Materials with low U-values will be specified to ensure that infiltration rates also exceed the requirements of Part L.

Element	Proposed construction U Value (W/m <sup>2</sup> K)	Building Regulation (2013) U Value (W/m <sup>2</sup> K)	
		Commercial	Residential
External Wall	0.13 - 0.15	0.35	0.30
Party Wall	-	-	-
Roof	0.13	0.25	0.20
Exposed floor	0.15	0.25	0.25
Glazing	1.3 (including window frame)	2.2	2.0
Roof lights	1.6 (including frame)		

**Table 1:** Comparison of proposed and current Building Regulation U-Values

In order to reduce unwanted solar gains into the apartments but maintain a high level of natural lighting, useful solar gain in winter and energy efficiency, high performance triple glazing will be used on all facades. The glazing will have the following characteristics:

Colour:	Neutral
Visible light transmission (LT Factor):	0.65 (min)
Thermal transmittance (G-Value):	0.60 (max)

The building construction process shall incorporate robust details as developed by the Building Research Establishment (BRE) in order to ensure building air tightness for all areas of 3 m<sup>3</sup>/hr/m<sup>2</sup> at an applied pressure of 50Pa. These figures are a significant improvement on the Building Regulation Part L minimum requirement of 10 m<sup>3</sup>/hr/m<sup>2</sup> at an applied pressure of 50Pa, in short they will improve the building's air tightness, thereby reducing the building energy consumption and, as a result, the energy required to heat the internal spaces.

### 3.1.4 Passive solar design

The provision of natural daylighting is an important consideration in passive solar design and the design team have made a conscious effort to optimise daylight penetration into all apartments optimising the benefits of the orientation of Building R3 within the overall KXC scheme.

The quality of daylight within an interior space may be quantified by the Average Daylight Factor or ADF. The BRE Guidelines recommend that daylight to habitable rooms (i.e. kitchens, living rooms and bedrooms) in new build accommodation should be assessed using the ADF. The table below summarises the recommended values for habitable rooms from the document, as referred to in Condition 43 of the Outline Planning Permission:

Area	Target ADF
Kitchens	2.0%
Living Rooms	1.5%
Bedrooms	1.0%

**Table 2:** Summary of dwelling recommended daylight factor from BRE's Site Layout Planning

The BRE guide, therefore, has been a key reference within the architectural design process of R3 which has culminated in 76% of the residential units meeting/exceeding the BRE guidelines for the daylight assessments.

In terms of sunlight ensuring that those apartments which do receive direct sunlight do not also suffer from excessive solar gain in the summer has been a key driver. Unusually for a residential building all apartments in R3 are either east or west facing and this puts a considerable pressure on issues of overheating in the summer hence the large number window which are shaded by decorative screens and overhanging balconies.

The Standard Assessment Procedure (SAP) calculation methodology has been used to assess overheating for all apartments in the building. All apartments benefit from large opening doors which generally open onto the balconies overlooking the adjacent parks. These provide adequate natural ventilation to mitigate the risk of overheating and the results from the calculations indicate that this risk is not significant. A sample calculation has been included in Appendix A.

### 3.1.5 Scope for using thermal mass

Utilising the thermal mass of a building can reduce peak heating and cooling loads and thus reduce annual energy consumption. Incorporating the building's thermal mass within occupied areas can reduce or remove the need for mechanical cooling systems. To exploit the thermal mass of the building, either direct or indirect contact is required between the structure and the occupied space, via exposed surfaces or energy exchange systems. Given that much of the building is residential there is limited opportunity to exploit the thermal mass directly; this is because the internal finishes will reduce the effectiveness of the concrete structure as an energy store within the apartments.

### **3.1.6 Choice and design of building systems**

The building servicing strategy has been designed to maximise the use of the site-wide, low-carbon district energy system. The district heating pipework will enter the building in the basement and heat will then be circulated around the building via a heat exchanger (located in the basement plant room) and distribution pipework.

The apartments will be provided with a Heat Interface Unit (HIU) that will extract heat energy from the distribution pipework and utilise the heat energy to provide hot water and heating to apartments. All pumps and drives will be inverter driven, allowing them to match the energy requirements of the building. Space heating will be provided by underfloor heating with zone control, allowing a degree of user control within each room and the ability to reduce further energy requirements on a room-by-room basis.

A Building Management System (BMS) system will be provided to control and monitor the following:

- a) District heating system plate heat exchangers (secondary side)
- b) Secondary heating pumps
- c) Cold water storage high and low water level alarms
- d) Cold water booster systems
- e) Incoming electricity metering and Part L compliant sub-metering
- f) Monitoring of heat energy metering within the apartments
- g) Monitoring of apartment water metering
- h) Cooling plant pumps and chiller

The use of a BMS enables automatic system control to ensure the building services operate at maximum efficiency. Monitoring the building services systems assists in maintaining optimum energy consumption through data interrogation and resolution of potential problems.

### **3.1.7 Natural and mechanical ventilation**

All apartments will be provided with whole house mechanical ventilation units with integral heat recovery. The proposed use of whole house mechanical ventilation systems will reduce excessive loads on the heating system by preheating incoming 'cool' air in winter via exhaust air, thus saving energy for the occupier.

The whole house ventilation systems are designed to operate in two modes; the default mode providing continuous background or 'trickle ventilation' and the second mode providing a 'boost' condition, activated when the bathroom light switch is activated. Supply air will be filtered and will serve the lounge and bedrooms whilst extract air will be provided from the bathrooms, en-suites and kitchen areas. Rigid, slim duct systems will be routed through the ceiling voids. The intake and discharge points to the flats will be shrouded by architecturally detailed louvres which will form part of the window design.

Purge ventilation is also provided to all apartments by opening windows/patio doors to achieve Approved Document Part F of the Building Regulations compliance and to provide residents with a greater degree of internal control.

A dedicated riser has been included to allow the south commercial unit to install a ventilation duct to roof level to allow the unit to be used for a wider range of uses including catering.





### **3.1.8 Scope for intelligent lighting and other technology to optimise use of natural light**

The internal lighting systems have been specified to produce further reductions in energy consumption. All dwellings will feature energy efficient lighting, exceeding the 75% minimum (energy efficient luminaires as a percentage of the total luminaires within an apartment) requirement stipulated in Part L 2013 of the Building Regulations and the 75% standard quoted in the Code for Sustainable Homes design criteria. The lighting installation will integrate low energy, high efficiency LED or compact fluorescent light fittings with down lights in all apartments and communal areas.

The lighting in the circulation spaces will feature presence detectors to minimise energy consumption.

External lighting will be zoned and controlled via a solar dial time clock and photocell daylight sensors.

Whilst light fittings in the commercial units are the responsibility of the tenant, there is a commitment to facilitate energy-efficient luminaires with daylight linking. Thus, the lighting control system will use intelligent dimming that responds to daylight levels and occupancy sensors and timers to ensure that lighting is only energised when required. The incoming commercial tenants shall be responsible for ensuring that the lighting within their demise operates in accordance with those systems.

### **3.1.9 Specification of plant**

Plant sizing has been designed to optimise the efficiency of the systems, by matching installed capacity to demand. The Energy Centre and Main Electrical Sub-Station within Building T1 are already built and these will provide thermal energy (i.e. heat and hot water) and offset electrical power for Building R3 (see Section 3.4).

Items of equipment which make up the Building R3 mechanical building services installation includes cooling plant and ventilation system to the basement which will be specified to achieve high annual energy efficiency operation.



### 3.2 CONDITION 17 (B): REDUCTION IN CARBON EMISSIONS

***'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 of application(s) for approval of reserved matters are submitted.'***

Building R3 is primarily a residential development which falls under the control of Building Regulation Approved Document Part L1A (ADL1A). However, the scheme also contains two commercial units on the ground floor that is covered by Building Regulation Approved Document Part L2A (ADL2A).

#### Residential Areas

The residential areas of the development have been subject to a preliminary assessment using SAP (Standard Assessment Procedure) on a large sample of representative apartments to guide the design development and maximise the carbon emissions savings achievable by the proposals. Results on these apartments were then area-weighted to assess the overall average performance of the residential areas.

The Section 106 Agreement, Section X, targets each new KXC building to achieve a 5% carbon emissions reduction against Part L of the prevailing Building Regulations based on the use of energy efficient and passive design measures, and any low-carbon energy supply not already accounted for in the Outline Planning application.

Passive design measures targeted at the Proposed Development include:

- a) Suitable glazing ratio, glazing performance and shading to balance heat losses, heat gains and daylight ingress
- b) Fabric insulation levels achieving improvements over Building Regulations Part L (2013) requirements of 50% - 57%
- c) Fabric air permeability achieving improvements over Building Regulations Part L (2013) requirements of 70%

Energy efficiency measures targeted at the Proposed Development include:

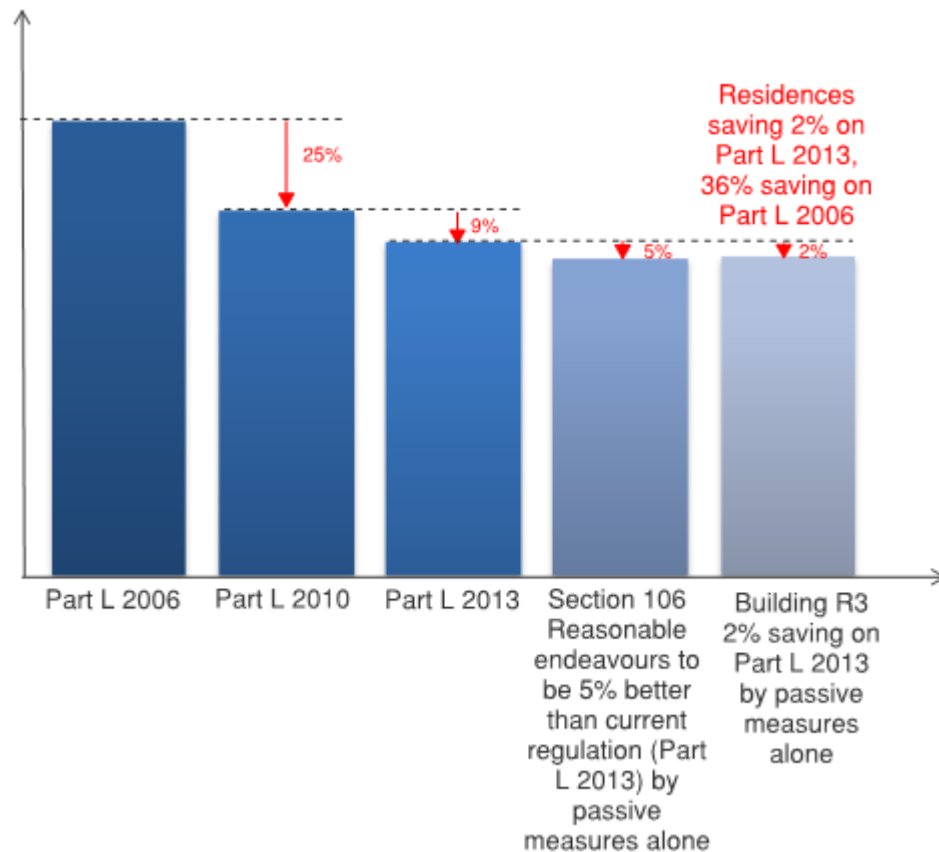
- a) Efficient space heating systems with zonal, programmable and thermostatic controls, with separate programmer for hot water
- b) Efficient low-energy lighting throughout all dwellings. External and communal lighting will be coupled to daylight and presence detection sensors to minimise unnecessary use
- c) Efficient mechanical ventilation with heat recovery which will limit the need for space heating in winter months and maintain good indoor air quality
- d) Insulated pipework and ductwork (and air sealing to ductwork) to minimise losses and gains
- e) Variable speed pumps and fans to minimise energy consumption for distribution of services

The scheme has been registered under Part L2B 2013, the current building regulation at time of planning application, and will be assessed as such.

On the basis of the passive design and energy efficiency measures set out in Section 3.1, the area-weighted carbon emissions (derived from the Dwelling Emissions Rate – DER in kg CO<sub>2</sub>/m<sup>2</sup>/yr calculated for all apartment types) from the residential areas of Building R3 are currently predicted to be 72 tonnes CO<sub>2</sub>/year, this is a 2% improvement on expected Part L1A 2013 carbon emissions compliance levels of 73 tonnes CO<sub>2</sub>/year, as derived from the Target Emissions Rate (TER).

This would equate to a saving of at least 11% compared to Part L 2010, which is significant. It should also be noted that Building R3 is the first residential scheme submitted at KXC under Part L 2013, while previous schemes were assessed under Part L 2006 or 2010 and were therefore subject to less onerous carbon reduction targets than Building R3 is now.

The delivery of considerable carbon emissions savings is illustrated in the following figure, which illustrates the overall improvement on Part L 2006, Part L 2010, Part L 2013 and Section 106 for the proposed residential areas of Building R3, prior to the incorporation of Combined Heat and Power (CHP) or other low carbon technology.



**Chart 1:** Energy Reduction Hierarchy based on passive design and energy efficiency measures alone

The passive design and energy efficiency carbon reduction measures adopted into building R3 have achieved a marked improvement over the current 2013 building regulations. Part L 2013 is at the forefront of energy efficiency for residential apartment buildings and is significantly more onerous than the regulations at the time of the Section 106 agreement, as such a reduction of 2% on this target is a considerable achievement.

#### Residential Amenity Facilities and Commercial Areas

The scheme is largely (95%) residential-led and this use is therefore the focus of this report. The non-residential areas will however benefit from the highly-efficient building envelope. Services in the residential amenity facilities will be highly efficient, and services in the commercial areas will be fitted out by the retail tenants, but with heat and hot water from the low-carbon district heating scheme and cooling from the building's cooling plant. Initial Part L2A 2013 Criterion 3 modelling has been carried out on the ground floor elevations to inform design development and ensure building regulation compliance of the commercial units.

### 3.3 **CONDITION 17 (C): PROVISION FOR GREEN AND/OR BROWN ROOF**

*'Explain the specification for any green and/or brown roofs.'*

The Outline Planning Permission defines Plot R3 as a priority location for green/brown roofs as shown on Parameter Plan KXC 021 Priority Zones for green / brown roofs and Wind Turbines.

Where the north and south roofs are not covered by plant or terrace area, there will be an intensive green roof. As per the King's Cross Green Roof Strategy, the roof will be a 'Sunny Meadow' green roof consisting of 100mm substrate and typically achieving 100% vegetation cover. The total green roof area is 310m<sup>2</sup>, that is to say 37% of the total roof area.



*Sunny meadow, Sharrow School, Sheffield*

Atmospheric carbon dioxide will be absorbed by the green roof, allowing it to play a part, albeit small, in offsetting the emissions of the building. This offset has not been included in the Building Regulations calculations but forms a benefit in its own right.

Landscaped private roof terraces totalling 243m<sup>2</sup> for use by residents will be provided at 8th and 11th floor levels.

Taking all of these roof types into account, 66% of the total roof area of Building R3 will be either green roof or landscaped terraces.

### **3.4 CONDITION 17 (D): ENERGY SUPPLY**

*Explain how energy shall be supplied to the building(s), highlighting;*

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

#### **3.4.1 The KXC Energy Centre**

Building R3 will be served for all its space heating and hot water demand from the T1 Energy Centre, which has already been approved, constructed and commissioned to meet the heat and hot water demands of the first occupiers at KXC; including the University of the Arts London, commercial tenants in the Western Transit Shed, the German Gym, buildings in Zone B, and residents of Buildings T6, J, R4, E1 and R5 North.

KCCLGP and its partners have established the Energy Services Company ('ESCo') to run the district heating, and the necessary heat and power distribution infrastructure has been and is being installed across the KXC site to enable the connection of each new building, and where appropriate retained buildings, to the district energy network. The Combined Heat and Power ('CHP') engines within the T1 Energy Centre will also generate electrical power, which will offset a significant percentage of the demand from this and other buildings. When fully operational, it is anticipated that the T1 Energy Centre will include the following principal items:

- 3 no. 1.8 MWth gas fired CHP engines
- A thermal store, integral to the CHP operating hours strategy
- 3 no. 9 MWth gas boilers.

These items will be installed on a phased basis as the scheme reaches critical mass, in order to meet peak demands and optimise efficiency.

As outlined in previously submitted (and approved) Environmental Sustainability Plans, future provision has been made within the KXC development for the inclusion of biofuel boilers. At this time, a robust commercial case to support the inclusion of biofuel cannot be made; however, this position continues to be actively monitored. The scope for a secondary energy centre at KXC could provide for its inclusion later, subject to procurement of an appropriate fuel source in line with clause 20(a) of Section X of the Section 106 Agreement.

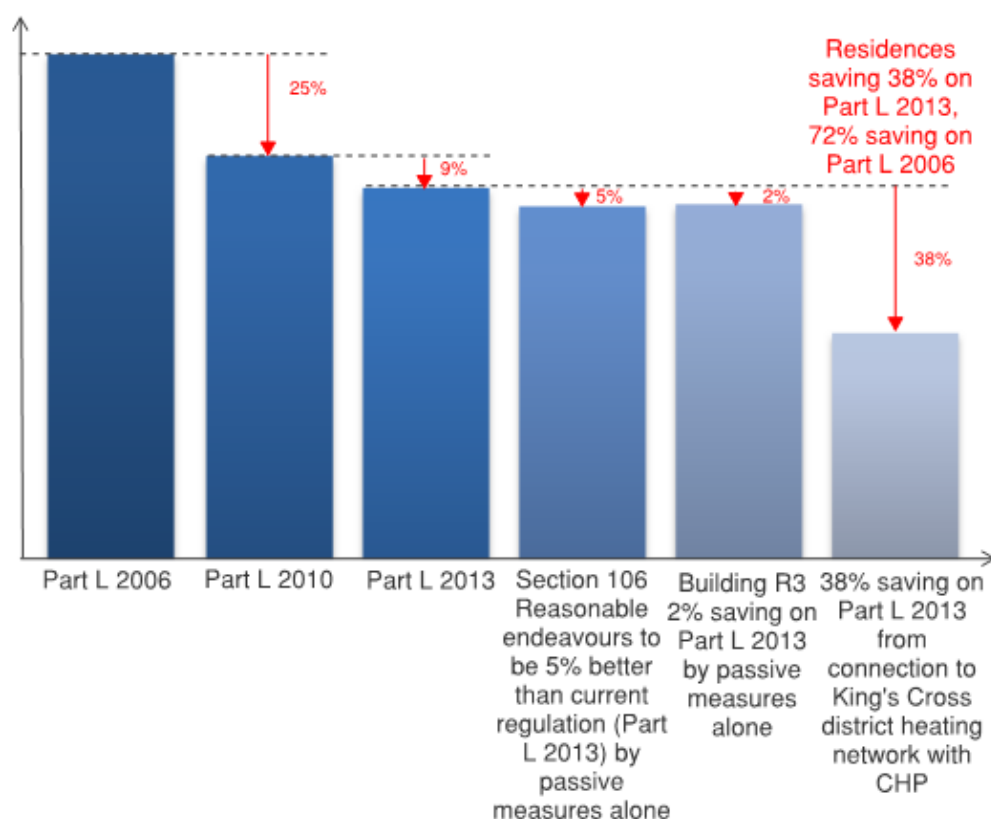
#### **3.4.2 CO<sub>2</sub> Savings Arising from the District Energy System**

The carbon emission calculations used within this report have assumed that, in total, 66% of the space heating and hot water used across the KXC site will be produced by CHP with the remainder provided by gas fired boilers. The CHP efficiency was taken from data provided by the ESCo, i.e. approximately 38% thermal efficiency and 38% electrical efficiency.

## Residential areas

Taking into account the passive design and energy efficiency measures set out in Section 3.1 of this plan and the contribution made by the building's connection to the low-carbon district heating system, the area weighted carbon emissions of the residential areas are expected to be further reduced from approximately 72 tonnes CO<sub>2</sub>/year (with passive design and energy efficiency alone) to 45.5 tonnes CO<sub>2</sub>/year, representing an average 38% reduction in emissions compared to Part L1A 2013 compliance levels (approximately 73 tonnes CO<sub>2</sub>/year).

Chart 2 below provides the overall improvement on Part L 2013 and Section 106 for the proposed design, including the CO<sub>2</sub> emissions reductions made as a result of the connection to the low-carbon heating supply.



**Chart 2:** Energy Reduction Hierarchy

## Commercial and Residential Amenity Facilities Areas

The district heating and cooling scheme will provide further carbon savings on the non-residential areas, after passive design and energy efficiency services.



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### 3.4.3 Renewable Energy Options

The Outline Planning Permission and Parameter Plan KXC021 do not highlight Building R3 as a priority location for renewable energy generation. A number of technologies were however considered for suitability but are not considered appropriate to the scheme due to a number of factors:

- Wind turbines – Plot R3 is within the priority zone for wind turbines set by parameter Plan KXC021. In any event, there is mixed evidence regarding the actual ‘in-use’ output of building-mounted wind turbines and turbines can potentially give rise to noise, vibration and shadow flicker which can impact on residential amenity. Consequently, they are not considered appropriate in this location. On other projects, the proposed wind turbines have been replaced by additional photovoltaic panels.
- Solar hot water – As identified at the outline stage, there are practical problems associated with linking roof top collectors for solar hot water to individual dwellings within high density apartment blocks. Further, increasing the extent of solar water heating to residential apartment blocks has been discounted because it reduces summer heat demand and hence reduces the commercial viability of the district heating CHP.
- Ground source heat pumps (GSHP) – The application of GSHP for Building R3 has been examined but is not considered appropriate. Typically, this type of system is best suited to a building where heating and cooling demands are relatively balanced. Given that the proposed scheme is predominantly residential, cooling demands are minimal and, since all of the thermal energy demands of the building will be supplied from the low carbon district heating energy system, there is limited benefit to be gained from a GSHP system.
- Photovoltaics – The installation of arrays of photovoltaic panels on Building R3 was examined, only the upper roof is potentially suited to such a system. However, given its relatively small roof area, it was felt that the renewable energy contribution of photovoltaics on this block would not be sufficient enough to justify the installation or the loss of the proposed green roof.

### 3.5 CONDITION 17 (E): BREEAM AND CODE FOR SUSTAINABLE HOMES

*'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'*

#### Code for Sustainable Homes

The BRE EcoHomes assessment system, referred to in Condition 17(E), was effectively superseded in April 2007 for all new residential projects by the Government's *Code for Sustainable Homes* ('CfSH') scheme. The CfSH is an equivalent system of assessment for the purposes of that condition. Although most credits under the CfSH are 'tradable' (i.e. chosen at the discretion of the design team), there are a number of mandatory credits for each level of achievement in every dwelling, such as under the energy and water sections.

The CfSH assessment provides an overall score and rating for each individual dwelling across 6 levels, with Level 6 equating to a zero carbon home. Currently CfSH Level 3 approximately equates to an EcoHomes rating of 'Very Good' and we have used this as the minimum target standard under Condition 17(E). However, the project team is actively targeting the achievement of CfSH Level 4.

Hoare Lea have carried out a CfSH pre-assessment for the apartments in Building R3, the full report for which is attached as Appendix C. The assessment provides the design team with an overview of the minimum requirements each dwelling must achieve to obtain CfSH Level 3 ( $\geq 57\%$ ), and indeed, Level 4 ( $\geq 68\%$ ).

Chart 3 and the summary points table on the following page indicate the predicted score for Building R3 of 69.2%, which equates to a Level 4 CfSH rating. Additional credits have been identified in brackets to improve the score to 75.1%.

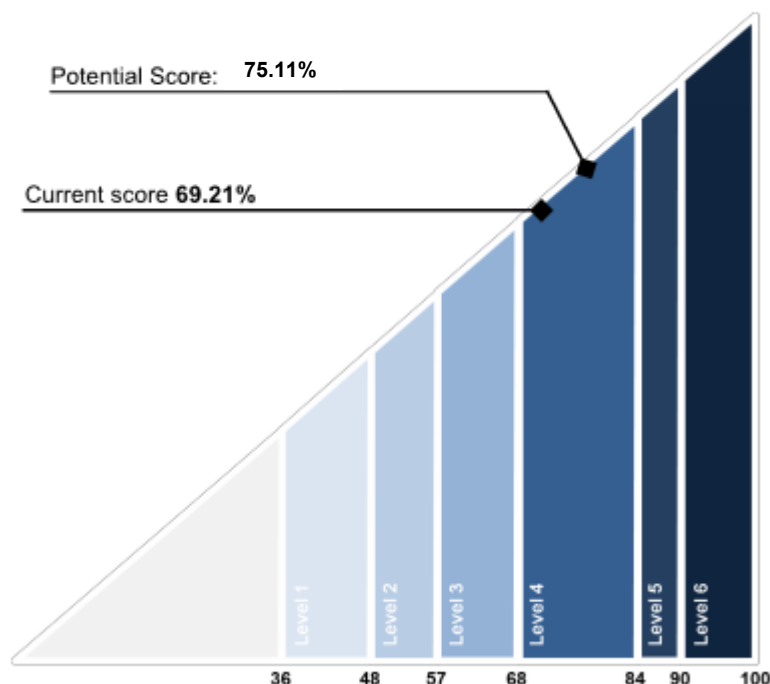


Chart 3: Summary of CfSH score

Category	Issue	Available Credits	Credits	
			Targeted	Potential
Energy and CO <sub>2</sub> Emissions	Ene 1: Dwelling Emission Rate (M)	10	4	-
	Ene 2: Fabric Energy Efficiency (M)	9	5	-
	Ene 3: Display Energy Devices	2	2	-
	Ene 4: Drying Space	1	0	1
	Ene 5: Energy-labelled White Goods	2	2	-
	Ene 6: External Lighting	2	2	-
	Ene 7: Low and Zero Carbon Technologies	2	2	-
	Ene 8: Cycle Storage	2	2	-
	Ene 9: Home Office	1	1	-
Water	Wat 1: Indoor Water Use (M)	5	3	-
	Wat 2: External Water Use	1	1	-
Materials	Mat 1: Environmental Impact of Materials (M)	15	6	-
	Mat 2: Responsible Sourcing of Materials (Building Elements)	6	3	-
	Mat 3: Responsible Sourcing of Materials (Finishing Elements)	3	1	-
Surface Water Run-off	Sur 1: Management of Surface Water Runoff (M)	2	0	-
	Sur 2: Flood Risk	2	2	-
Waste	Was 1: Storage of Non-Recyclable Waste and Recyclable Waste (M)	4	4	-
	Was 2: Construction Site Waste Management	3	3	-
	Was 3: Composting	1	1	-
Pollution	Pol 1: Global Warming Potential (GWP) of Insulants	1	1	-
	Pol 2: NO <sub>x</sub> Emissions	3	3	-
Health & Wellbeing	Hea 1: Daylighting	3	0	1
	Hea 2: Sound Insulation	4	3	-
	Hea 3: Private Space	1	1	-
	Hea 4: Lifetime Homes (M)	4	4	-
Management	Man 1: Home User Guide	3	3	-
	Man 2: Considerate Constructors Scheme	2	2	-
	Man 3: Construction Site Impacts	2	2	-
	Man 4: Security	2	0	2
Ecology	Eco 1: Ecological Value of the Site	1	1	-
	Eco 2: Ecological Enhancement	1	1	-
	Eco 3: Protection of Ecological Features	1	1	-
	Eco 4: Change in Ecological Value of the Site	4	2	1
	Eco 5: Building Footprint	2	2	-
Weighted Score: <b>CfSH Pre-Assessment Rating:</b>			69.21% <b>'Level 4'</b>	75.11% <b>'Level 4'</b>

**Table 3: Building R3 CfSH Credit Summary**



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### **3.6 CONDITION 17 (F): ECOLOGY**

***‘Explain the incorporation of bird boxes, bat roosts and other wildlife features on the building’.***

The landscape strategy (as described in our response to condition 17(C) in Section 3.3) offers opportunities for ecological enhancement and increased biodiversity, helping Plot R3 to make a contribution towards fulfilling objectives within the London Biodiversity Action Plan.

Where the north and south roofs are not covered by plant or terrace area, there will be an intensive green roof. As per the King's Cross Green Roof Strategy, the roof will be a 'Sunny Meadow' green roof consisting of 100mm substrate and typically achieving 100% vegetation cover. The total green roof area is 310m<sup>2</sup>, that is to say 37% of the total roof area.

The project Ecologist (from RPS) has carried out an assessment of Plot R3 and provided a number of ecological enhancement recommendations for the development. These have been considered as part of the overall landscaping strategy for the scheme and will be implemented where practical to do so. In summary, the enhancement measures under consideration include:

**Bats** – A common pipistrelle bat was recorded foraging and commuting within an adjacent area of the Kings Cross redevelopment site in 2007, thus the overall area is utilised by bats. In terms of enhancement measures for bats as part of the redevelopment, simple bat boxes could be attached to the external walls of the Plot R3 building. Other measures include bat bricks and tubes that could again be used on the external structure.

**Birds** – In the past and at present no evidence of bird nesting has been recorded on the Plot R3 site. The proposed redevelopment will be highly urbanised so built-in bird boxes or external bird boxes should be considered on the new building to provide nesting areas for species of birds known to use the wider Kings Cross development area. Nest boxes of varying kinds should be considered which are suitable for different bird species such as house sparrow and black redstarts which have been recorded nearby during previous RPS ecological surveys (2007).

**Invertebrates** – Insect walls/hotels could be created on some of the roof terraces of Plot R3. The walls should be created on south-facing walls but avoiding direct sunlight but ensuring the areas sheltered from the wind.

Flowers like primroses and knapweed provide nectar and pollen for bees and other beneficial invertebrates and should be considered as part of the landscape strategy.

**Landscaping** – The Plot R3 site is of low ecological value and the landscape proposals for the site could really increase the value of the area for wildlife. The landscaping proposed for the development site should use native planting to provide high quality landscaping and to promote nature conservation by attracting local wildlife. Native planting will also tie in with the existing vegetation on the site. Native species planting will attract seed eating birds and foraging bats. Night-scented flowers attract night flying insects, which provide an important food source for bats.

### 3.7 CONDITION 45: DRAINAGE

***'Explain how the new drainage infrastructure within the site shall be designed to achieve a combined (storm and foul) peak discharge to the existing combined sewer of 2,292 l/s or less'***

#### 3.7.1 Site wide drainage infrastructure

The figure of 2292 l/s in the wording to 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 1 below

Drainage Infrastructure Area	Plot developments	Infrastructure / Public Realm
Eastern Goods Yard	The Granary Complex, Q1, Q2, R1, R3, R4, R5, R7 & 8, S1, S2, T1, T2, J1, H1, K1, K2, K3, K4 and 50% of I1	Transit Street, Wharf Road, Goods Street, Granary Square, Cubitt Park and Handyside Park
Southern Infrastructure Area	A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, D1, D2, F1 and V1	The Boulevard, Goods Way, Station Square and Pancras Square
Remainder of the Northern Area including the Triangle Site	M1, M2, N1, N2, P1, P2, S3, S4, S5, T3, T4, T5, T6 and W1	Canal Street and Cubitt Square

**Table 3 – Drainage Infrastructure Areas**

Table 4 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 5. 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.

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.

Plot reference	Assumed Peak Flows (l/s)	
	Surface Water (1 in 30 year event)	Foul Water
Eastern Goods Yard		
G1	25	1.1
H1	15	0.9
J1	147	4.2
K1	24	1.2
K2	101	0
K3	150	6
K4	117	1.8
L1 - L7	1105	25.2
Q1 & Q2	191	7.3
R1	57	11.8
R7 & 8	257	12.8
R3	128	4.6
R4	127	3.5
R5 (North & South)	173	5.3
S1	158	11.9
S2	162	12.7
T1	192	2.1
T2	162	10.2
I1	25	1.2
N2	84	0
Totals	3400	123.8

**Table 4 – Peak Surface and Foul Water Flows for the Eastern Goods Yard Area**

Land Use	Demand Options	Discharge to Sewer (l/day/hd)	l/s/head	Operational Hours	Population Density (m2 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

**Table 5 - Foul water discharges from various land uses**

#### Drainage Infrastructure relating to Plot R3

Plot R3 is serviced by the Eastern Goods Yard drainage systems (Table 1), and discharges via a restricted discharge in to the combined Thames Water Camden 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 water discharge into the Camden Sewer for the network serving Plot R3. The approved discharges reflect the assumptions described in Tables 2 and 3 (above). The approved surface water discharge peak flows for Building R3 are 128 l/s and 4.6 l/s for surface water and foul water, respectively. It should be noted that the figures in Table 2 do not specifically include public realm areas. However, the Eastern Goods Yard 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 restricted so that the permissible discharges set out in the Outline Planning Permission are not exceeded.

Drawing 20227-007-500-05 shows the surface water sewer network serving Plot R3 and the associated catchment area. The network has been installed and is live. The adopting drainage authority (IWNL) has approved the design and installation. The connection to the Camden Sewer has been made in accordance with the associated Section 106 consent granted by Thames Water Utilities Ltd. Flows within the network are controlled via a hydrobrake unit in Stable Street to ensure that the agreed discharge to the Camden Sewer is not exceeded.

## 4 Section 106 Agreement

### 4.1 SECTION AA: WATER

*Section AA of the Section 106 agreement places an obligation to use reasonable endeavours:*

- I. To incorporate within the detailed design water efficiency measures such that the design secures at least 40% of the potable water consumption credits available under the BREEAM methodology which represents a reduction of approximately 20-30% against typical water consumption,*
- II. To incorporate one or more of groundwater abstraction, grey-water and black-water recycling and rainwater harvesting as alternative water supplies to meet 5% or more of the non-potable water needs and*
- III. To ensure that the design for the treatment of storm water run-off incorporates, where practicable, filtration, attenuation and other techniques that is consistent with current best practice on SUDS, to control the timing and volume of flows.*

#### 4.1.1 Domestic water use

The Code for Sustainable Homes water calculation methodology has been applied in relation to residential water consumption.

The environmental benefits that can be achieved by installing carefully selected water efficient sanitary ware and appliances have been recognised by the project team and the proposals seek to reduce the internal consumption rate of the dwellings to 105 litres/person/day as a maximum. This would represent at least a 30% reduction against typical water consumption, and is a mandatory requirement of Level 4 of the Code.

In order to achieve this consumption rate within the residential element of the building, the project team will specify water efficient sanitary fittings and appliances as standard to all dwellings.

A priority objective for the project team is to significantly enhance the ecological value of the Building R3 site, through the promotion of the Local Biodiversity Action Plan. The proposals therefore include green roofs as described in Sections 3.3 and 3.6. It will be critical to maintain these features and protect against drought risks if the ecological value is to be retained. The planting of native species will help to some extent since these species tend to be resilient to the current UK climate and can readily go for periods of time without precipitation.

#### 4.1.2 Water recycling

Water reuse has been investigated for Building R3 to further reduce the demand for mains-supplied water for WC flushing. Although rainwater harvesting is the most common system for using recycled water, the opportunities for collection from roof areas are reduced by the large areas of green roof, such that the additional collection and distribution infrastructure required would be challenging, with high capital costs and limited benefits.

Communal greywater recycling systems have been investigated for use in the residential units. However, it has been considered that this would not be viable for Building R3 due largely to the significant plant room space constraints within the building.



Single greywater recycling systems within the dwellings would also be impractical due to space constraints, the prohibitive cost of supplying individual systems to many units, and the maintenance requirements of these systems.

#### **4.1.2 Sustainable drainage**

Surface water drainage methods that take account of quantity (flooding), quality (pollution) and amenity issues are collectively referred to as Sustainable Urban Drainage Systems ('SUDS'). Due to the way that SUDS manage flow rates from hard surfaces, protect natural flow regimes in existing watercourses, and can protect and even enhance water quality, they are considered more sustainable than traditional drainage methods.

In Building R3 and its associated public realm, SUDS have been integrated wherever possible to effect source control and storm water retention/infiltration, provide permeable surfaces and encourage evapotranspiration (e.g. from green/brown roofs). These controls have been located as close as possible to the rainwater source, providing attenuation of the runoff.

As described in Section 3.3 of this Plan, a green roof and roof terraces featuring container planting will be provided. In addition, the adjacent Cubitt Park and Zone R Gardens will incorporate areas of planted beds, trees and raised lawns. These features will help reduce the peak flow and the total volume discharged by attenuating or detaining rainfall and on warmer days, by encouraging evapotranspiration.

For details on the site-wide drainage strategy, please refer to Section 3.7 of this report.

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## **4.2 SECTION Y: CONSTRUCTION MATERIALS AND WASTE**

*Section Y of the S.106 Agreement imposes obligations to:*

*Implement the Construction Materials and Purchasing Strategy*

*Apply the Construction Materials and Purchasing Strategy to agreeing specifications and targets in contracts with contractors, designers and suppliers of services in relation to construction*

*Use reasonable endeavours*

- I. to minimise packaging waste associated with the delivery of construction materials*
- II. to produce topsoil and subsoil that uses subsoil and crushed rubble from the site combined with organic material for use in areas of landscaping*
- II. to achieve the Construction Targets*

### **4.2.1 Construction Materials and Purchasing Strategy**

The project team intend that the best practice will be followed on the Building R3 development, following on from the R5 buildings and surpassed wherever practicable, in order to maximise resource efficiency. The Construction Materials and Purchasing Strategy set out in the Section 106 Agreement will be adopted, while careful planning and effective control will ensure that waste during the construction phase is minimised.

### **4.2.2 Packaging waste**

Packaging used to protect construction materials and assemblies in transportation will be kept to a minimum and wherever possible returned to be re-used.

### **4.2.3 Soil**

Building R3 currently comprises approximately 2m of highly variable made ground. There is no top soil to be removed and re-instated.

Due to the Brownfield nature of the site, there are no natural topsoil or subsoil resources on site. A Topsoil Manufacture Feasibility Study has been undertaken by Tim O'Hare Associates to assess the suitability of site-won clay fill from the KXC site as a constituent of manufactured topsoil, rather than importing material onto site for landscaping use. Due to the density, plasticity and poor drainage qualities associated with clay fill, the study concludes that manufactured topsoil derived from this material would not be suitable for use in permanent landscaping schemes such as green/brown roofs (which require a light weight substrate) or tree pits. As such, it is recommended that imported organic material is used in these areas.

The separate Earthworks and Remediation Plan for Zone R West Basement (submitted May 2015, with ref. 2015/2889/P) addresses the nature and quantity of materials arising and the arrangements for their re-use and disposal.

### **4.2.4 Construction Targets**

In terms of the Section 106 targets, a commitment has been made by the project team to achieve all necessary targets and develop a strategy to operate site management procedures to mitigate



environmental impacts. Additionally, the proposed development has targeted maximum credits under the Code for Man 3 Construction site impacts. This will require the development to implement procedures that cover 4 or more of the items listed below:

- Monitor, report, and set targets for CO<sub>2</sub> production or energy use arising from site activities;
- Monitor and report CO<sub>2</sub> or energy use arising from commercial transport to and from site;
- Monitor, report and set targets for water consumption from site activities;
- Adopt best practice policies in respect of air (dust) pollution arising from site activities;
- Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site;
- 80% of site timber is reclaimed, reused or responsibly sourced

In addition to the Section 106 requirements, the project contractor has its own corporate construction targets which will be applied to the proposed development.



## 4.3 SECTION Z: WASTE

**Section Z of the S.106 Agreement imposes obligations to:**

- I. Provide occupiers with Waste Information Packs and use reasonable endeavours to obtain feedback on the success or popularity of the initiatives contained within the Packs**
- III. Use reasonable endeavours to incorporate within the detailed design best practice design solutions that provide for waste segregation and storage areas and to maintain the solutions that are implemented**
- IV. Provide and maintain segregated waste containers within the Public Realm areas at suitable locations and in appropriate numbers.**

### 4.3.1 Waste information Packs

To comply with Section Z of the Section 106 Agreement, a simple 'home user guide' will be provided to all dwelling occupants. This guide will include information on operational issues, such as design features, energy and water, and the site and its surroundings, such as waste & recycling, transport, local amenities, etc.

### 4.3.2 Design

Details regarding the Waste and Refuse Strategy are included in the submitted Urban Design Report. Communal refuse storage shutles for residents of Building R3 will be provided at ground level. Building management will be responsible for moving bins from the basement store to the ground floor of R5 South for collection.

The commercial units will manage their own waste and then pickups will be from Cubitt Park road.

The locations of the refuse storage rooms are indicated on the submitted Architect's drawings (C645-P\_B1\_001).

In line with the CfSH compliance criteria, the development proposes the following strategy for operational waste and recycling, to be incorporated as part of the detailed design:

#### Storage of non-recyclable waste

**The space for waste and recyclable storage has been calculated using the waste generation criteria set out by the London Borough of Camden (LBC) for providing weekly storage for residential units. The weekly waste storage shown in Table 6 below, exceeds the minimum requirements recommended by BS 5906 (British Standards 2005).**

Habitable Rooms	No. Units	Camden Waste Factor/Week	Weekly Waste (m3)	British Standard Weekly Waste (m3)
1	3	0.15	0.45	-
2	21	0.20	4.20	-
3	28	0.25	7.00	-
4	9	0.30	2.70	-
Total	61		14.35	10.82

**Table 6 – London Borough Camden Weekly Waste Storage**

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*Adequate external space will be allocated to accommodate the Local Authority collection scheme. All containers will be accessible to disabled people and sited on a hard, level surface.*

*Storage of recyclable household waste*

*The following CfSH credits will be achieved to reflect the provision of dedicated internal storage for recyclable household waste:*

- Where recyclable household waste is sorted after collection (with a collection of at least fortnightly) and at least a single 30 litre bin is provided for recyclable waste in an adequate internal space. In addition to space for non-recyclable waste, 2no 15 litre bins are provided for compostable waste.*

*Public realm waste containers*

*Waste containers will be placed in the surrounding public realm areas. Their locations and treatment are being designed as part of a site-wide strategy.*



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## APPENDIX A

BUILDING REGULATIONS COMPLIANCE FOR MULTIPLE DWELLINGS CALCULATION WITHOUT  
DISTRICT HEATING

*This report checks compliance against criterion 1 of the Building Regulations where there are multiple dwellings in the same building. Where a building contains more than one dwelling (such as in a terrace of houses or in a block of apartments/flats), compliance with the Building Regulations is achieved if*

*a) EITHER every individual dwelling has a DER that is no greater than its corresponding TER*

*b) OR the average DER is no greater than the average TER.*

*The average DER is the floor-area-weighted average of all the individual DERs and is calculated in the same way as the average TER. Block averaging is permitted only across multiple dwelling in a single building, NOT across multiple buildings on a site.*

*The formula used is as follows:*

*$\{(TER_1 \times \text{floor area}_1) + (TER_2 \times \text{floor area}_2) + \dots + (TER_n \times \text{floor area}_n)\} / \{\text{floor area}_1 + \text{floor area}_2 + \dots + \text{floor area}_n\}$*

Assessor name	Mr Shubham Katakwar	Assessor number	9450
		Created	09/07/2015

Results							
URN	Version	Address	DER	TER	Floor Area (m <sup>2</sup> )	DER x Floor Area	TER x Floor Area
R3-Flat 9-1 3 Bed PH	12	9.1 R3	17.24	17.54	158.72	2736.33	2783.95
R3-Flat 8-3-3 Bed DU	11	8.3 R3	15.46	16.46	128.06	1979.81	2107.87
R3-Flat 7-3	14	7-3 R3	15.70	16.01	105.72	1659.80	1692.58
R3-Flat 4-7	14	4-7 R3	17.90	17.17	72.10	1290.59	1237.96
R3-Flat 4-5	11	4.5 R3	16.14	16.01	72.16	1164.66	1155.28
R3-Flat 3-8	11	3.8 R3	14.76	15.43	69.97	1032.76	1079.64
R3-Flat 3-7	10	3-7 R3	14.84	15.85	84.75	1257.69	1343.29
R3-Flat 2-8-1Bed	15	2.8 R3	17.18	17.76	50.54	868.28	897.59
R3-Flat 2-6 - Studio	11	2.6 R3	18.15	18.90	41.30	749.59	780.57
R3-Flat 2-5	16	2.5 R3	13.27	14.86	87.28	1158.21	1296.98
R3-Flat 10-1 4Bed PH	12	10.1 R3	15.58	15.12	205.65	3204.03	3109.43
R3- Flat 2-7 Studio	17	2.7 R3	16.47	18.19	46.54	766.51	846.56
R3-Flat 7-1	12	7-1 R3	16.78	16.98	90.48	1518.25	1536.35
R3 2-9	11	2.9 R3	16.79	16.84	52.54	882.15	884.77
			<b>Total</b>		<b>1265.81</b>	<b>20268.66</b>	<b>20752.82</b>

Multiple dwelling DER = 16.01

Multiple dwelling TER = 16.39

**Compliance = PASS**



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## APPENDIX B

BUILDING REGULATIONS COMPLIANCE FOR MULTIPLE DWELLINGS CALCULATION WITH  
DISTRICT HEATING

*This report checks compliance against criterion 1 of the Building Regulations where there are multiple dwellings in the same building. Where a building contains more than one dwelling (such as in a terrace of houses or in a block of apartments/flats), compliance with the Building Regulations is achieved if*

*a) EITHER every individual dwelling has a DER that is no greater than its corresponding TER*

*b) OR the average DER is no greater than the average TER.*

*The average DER is the floor-area-weighted average of all the individual DERs and is calculated in the same way as the average TER. Block averaging is permitted only across multiple dwelling in a single building, NOT across multiple buildings on a site.*

*The formula used is as follows:*

*$\{(TER_1 \times \text{floor area}_1) + (TER_2 \times \text{floor area}_2) + \dots + (TER_n \times \text{floor area}_n)\} / \{\text{floor area}_1 + \text{floor area}_2 + \dots + \text{floor area}_n\}$*

Assessor name	Mr Shubham Katakwar	Assessor number	9450
		Created	09/07/2015

Results				
URN	Version	Address	DER	TER
R3-Flat 9-1 3 Bed PH	11	9.1 R3	10.84	17.54
R3-Flat 8-3-3 Bed DU	10	8.3 R3	10.05	16.46
R3-Flat 7-3	13	7-3 R3	9.90	16.01
R3-Flat 7-1	13	7-1 R3	10.41	16.98
R3-Flat 4-5	10	4.5 R3	10.35	16.01
R3-Flat 3-8	12	3.8 R3	9.52	15.43
R3-Flat 3-7	9	3-7 R3	9.47	15.85
R3-Flat 2-8-1Bed	14	2.8 R3	10.73	17.76
R3-Flat 2-6 - Studio	10	2.6 R3	11.04	18.90
R3-Flat 2-5	14	2.5 R3	8.65	14.86
R3-Flat 10-1 4Bed PH	13	10.1 R3	9.98	15.12
R3- Flat 2-7 Studio	16	2.7 R3	10.17	18.19
R3 2-9	12	2.9 R3	10.72	16.84
R3-Flat 4-7	13	4-7 R3	11.21	17.17

Multiple dwelling DER = 10.16

Multiple dwelling TER = 16.39

**Compliance = PASS**



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## APPENDIX C

### BUILDING R3 CODE FOR SUSTAINABLE HOMES PRE-ASSESSMENT DESIGN ADVICE REPORT



Plot R3, King's Cross  
King's Cross Central General Partner Ltd

Code for Sustainable Homes Pre-assessment  
Rev. D  
July 2015





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London  
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Audit Sheet

Rev.	Description	Prepared and checked by	Reviewed by	Date
A	First draft pre-assessment for comment	S. Lloyd	L. Wille	09.12.2014
B	Incorporating meeting comments 10.12.2014 Incorporating minor changes to credit criteria as part of code addendum changes (primarily Part L 2013 changes in Ene 1 and 2)	S. Lloyd	L. Wille	10.12.2014
C	Updated following workshop with SP at HL offices 31.03.2015	W. White	-	23.04.2015
D	Updated following input from M&E	O. Boswell	-	21.07.2015

*This report is provided for the stated purposes and for the sole use of the named Client. It will be confidential to the Client and the client's professional advisers. Hoare Lea accepts responsibility to the Client alone that the report has been prepared with the skill, care and diligence of a competent engineer, but accepts no responsibility whatsoever to any parties other than the Client. Any such parties rely upon the report at their own risk. Neither the whole nor any part of the report nor reference to it may be included in any published document, circular or statement nor published in any way without Hoare Lea's written approval of the form and content in which it may appear.*



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## 1.0 Executive Summary

The 'Code for Sustainable Homes' (CfSH) is a recognised environmental assessment methodology adopted by the Government and managed by the 'Building Research Establishment' (BRE).

This pre-assessment contains a CfSH review and credit assessment for Plot R3, King's Cross, hereafter known as the 'Proposed Development.' This report outlines the current route in which the apartments at the Proposed Development could achieve a Code for Sustainable Homes 'Level 4' rating (i.e.  $\geq 68\%$ ) provided all of the relevant evidence is submitted in support of the targeted credits, and ALL of the mandatory credits have been achieved, as outlined in the Code for Sustainable Homes manual.

It is recommended that a margin of approximately 5% greater than the require score is targeted in order to ensure that the targeted rating is achieved at the design and construction phases and to allow for some design flexibility as the Proposed Development progresses.

The score is currently estimated to be **69.21%**. Further credits have been identified which would increase the score if targeted. These are outlined in section 1.1 and identified in the detailed assessment in Appendix A.

The team should review all credits to ensure that the pre-assessment score represents the current position of the Proposed Development.

Figure 1.1 illustrates the current pre-assessment score.

### 1.1 Potential Credits

A number of 'potential' additional credits have been identified should they be required to meet the minimum score. Note these can contribute to the total score but cannot be used to replace 'Mandatory' credits.

- **Materials 1, 2 & 3**  
A mid-range assumption has been made at this stage of the design. This is to be reviewed as the design progresses. A total of 14 additional credits are available however, these carry a relatively small weighting against the overall score  
(1 credit = 0.3%).
- **Hea 1 – Daylight**  
(+2 credits)  
Target score is pending daylight assessment to be undertaken by Hoare Lea Lighting.  
(1 credit = 1.17%)
- **Hea 2 – Sound insulation**  
(+1 credit)  
Team to confirm target pending discussions with Hoare Lea Acoustics  
(1 credit = 1.17%)
- **Eco 4 – Change of Ecological Value of Site**  
(+1 credit)

Additional ecological value to be evaluated by the team with the Ecologist

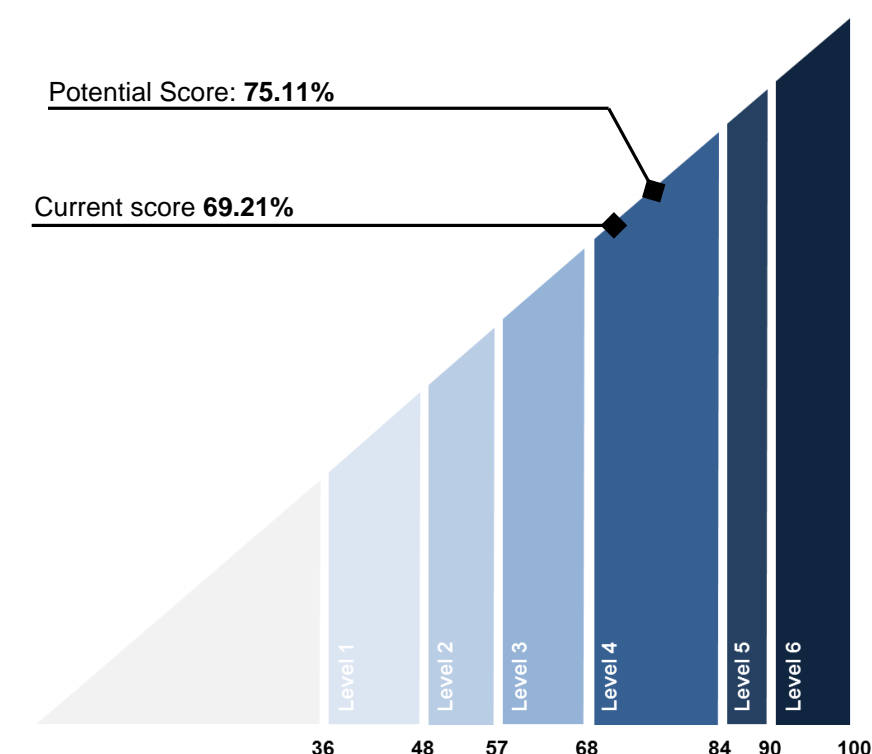


Figure 1.1: CfSH Scale and Pre-Assessment Score.

2.0 Introduction

The Code for Sustainable Homes (CfSH) is being used as a benchmarking tool in the design of new residential developments. The aim is to estimate the sustainability of buildings and to promote a programme of design improvement.

2.1 Background

The CfSH is published by the Department for Communities and Local Government (CLG). The current version of the CfSH (November 2010 version) is based upon the categories and issues as set out in Table 2.1. Mandatory requirements **(M)** that apply are described in the next section.

Table 2.1: CfSH Criteria.

Category		Issue
Energy and CO <sub>2</sub> Emissions	<b>M</b> <b>M</b>	Dwelling Emission Rate
		Fabric Energy Efficiency
		Display Energy Devices
		Drying Space
		Energy-labelled White Good
		External Lighting
		Low and Zero Carbon Technologies
		Cycle Storage
Water	<b>M</b>	Home Office
		Indoor Water Use
Materials	<b>M</b>	External Water Use
		Environmental Impact of Materials
Surface Water Run-off	<b>M</b>	Responsible Sourcing of Materials (Building Elements)
		Responsible Sourcing of Materials (Finishing Elements)
Waste	<b>M</b>	Management of Surface Water Runoff
		Flood Risk
Pollution	<b>M</b>	Storage of Non-Recyclable Waste and Recyclable Waste
		Construction Site Waste Management
Health & Wellbeing	<b>M</b>	Composting
		Global Warming Potential (GWP) of Insulants
		NO <sub>x</sub> Emissions
		Daylighting
Management	<b>M</b>	Sound Insulation
		Private Space
		Lifetime Homes
		Home User Guide
Ecology	<b>M</b>	Considerate Constructors Scheme
		Construction Site Impacts
		Security
		Ecological Value of the Site
		Ecological Enhancement

2.2 Mandatory requirements

Table 2.2 identifies the mandatory requirements pertinent to each CfSH rating level.

Table 2.2: Summary of Mandatory Requirements

Level	Ene 1: CO <sub>2</sub>	Ene 2: FEE	Wat 1: Water	Hea 4: Lifetime Homes	Total Points:
1	-	-	< 120l/p/d	-	36
2	-	-	< 120l/p/d	-	48
3	-	-	< 105l/p/d	-	57
4	- 25%	-	< 105l/p/d	-	68
5	- 100% (regulated)	<39 / <46	< 80l/p/d	-	84
6	- 100% (all)	<39 / <46	< 80l/p/d	Y	90

Further Mandatory Requirements apply under the following issues and apply to ALL levels:

- Environmental Impact of Materials;
- Management of Surface Water Runoff;
- Storage of Non-Recyclable / Recyclable Waste.

Failure to meet these criteria would restrict a development to a 'zero-rating' regardless of the overall number of credits achieved.

2.3 Early stage requirements

Table 2.3 identifies credits which at this stage of the design require action or as a minimum consideration at an early stage of the project

The credits are not mandatory; however failure to consider these credits at an early stage could prevent them from being targeted in the future and therefore limit the maximum score available.

Table 2.3: Early Stage consideration.

Credit	Action required	Responsible Party
<b>Ecology Eco 1-4</b>	A site survey is to be undertaken by a suitably qualified ecologist prior to any works starting on site.  If an ecologist survey has been undertaken, but previous to 5 years before site works commence the BRE will require a repeat survey to confirm the relevance of the initial survey results.	Argent to arrange
<b>Security Man 4</b>	Dialogue with ALO/CPDA's should be minuted and recommendations on designing a secure scheme need to be considered.	Squire and Partners
<b>Daylighting Hea 1</b>	Consideration required to guarantee targeted credits are achievable in the proposed design	Squire and Partners to consider design implications,  Hoare Lea appointed as daylight consultant
<b>General space considerations</b>	Several credits will have an impact on space planning and should be review as early as possible.  These include:  Ene 8 – Cycle Storage Ene 9 – Home Office Wat 2 – External Water Use – Storage of Non-Recyclable Waste and Recyclable Waste Wst 3 – Composting Hea 2 – Sound Insulation Hea 3 – Private Space Hea 4 – Lifetime Homes	Design Team

3.0 Conclusion

This pre-assessment outlines the current route for the Proposed Development to achieve a CfSH 'Level 4' rating which could achieve a score of 69.21% provided all of the relevant evidence is submitted in support of the targeted credits, and ALL of the mandatory credits have been achieved, as outlined in the Code for Sustainable Homes manual.

It is recommended that a margin of approximately 5% greater than the require score is targeted in order to ensure that the targeted rating is achieved at the design and construction phases and to allow for some design flexibility as the Proposed Development progresses.

Additional credits have been identified which would increase the score if targeted. These are outlined below and identified in the detailed assessment in Appendix A.

**The team should review all credits to ensure that the pre-assessment score represents the current position of the Proposed Development.**

3.1 Early actions

A number of early actions are set out in table 2.3. The team should pay particular attention to these credits at this early stage of the design to ensure that these credits are still targetable as the project progresses.

The most notable of these are credits Eco 1-4. These credits require the appointment of a Suitably Qualified Ecologist ('SQE') and undertaking of a site survey prior to the commencement of works onsite. There must also be no longer than 5 years between survey date and site works commencement.

Other credits identified in table 2.3 require consideration at this early stage for space planning and general arrangement of the design.

3.2 Potential credits

Should any of the currently targeted (non-mandatory) credits be lost, A number of 'potential' credits have been identified. These credits cannot be used to replace 'Mandatory' credits.

- **Materials 1, 2 & 3**  
A mid-range assumption has been made at this stage of the design. This is to be reviewed as the design progresses. A total of 14 additional credits are available however, these carry a relatively small weighting against the overall score (1 credit = 0.3%).
- **Hea 1 – Daylight**  
(+2 credits)  
Target score is pending daylight assessment to be undertaken by Hoare Lea Lighting.  
(1 credit = 1.17%)
- **Hea 2 – Sound insulation**  
(+1 credit)

Team to confirm target pending discussions with Hoare Lea Acoustics  
(1 credit = 1.17%)

- **Eco 4 – Change of Ecological Value of Site**  
(+1 credit)  
Additional ecological value to be evaluated by the team with the Ecologist



4.0 Appendix A: Detailed credit assessment

The following pages contain a detailed breakdown of the credit selection process.

Internal reference: calculation spreadsheets located here:  
Baseline: [../03%20Calculations/CfSH/CALC-2310324-3-SL-20141209-CfSH-Calculator-Rev%20C.xls](#)  
Potential: [03 Calculations/CfSH/CALC-2310324-3-SL-20150721-CfSH-Calculator-Rev D .POTENTIAL](#)

Issue		Credit Requirements	Credits			Responsible Party	Comments																																	
			Available	Target	Potential																																			
<b>Ene1</b>  Dwelling Emission Rate <b>(Mandatory)</b>	Credits are awarded based on the percentage improvement in the Building Regulations Part L (2013) Dwelling Emission Rate (DER) beyond the Target Emission Rate (TER).		10	4	-	HL	Updated SAP assessment from M & E confirm 4 credits targeted																																	
	Credits are awarded in accordance with the table below on a sliding scale. The scale is based on increments of 0.1 credits, distributed equally between the benchmarks defined.																																							
	To reach Level 4, 5 and 6 (zero carbon) there are additional requirements (see technical guidance).																																							
	<table><tr><th>Improvement over Building Regulations Part L (2013)</th><th>Credits</th><th>Mandatory Requirements</th></tr><tr><td>≥ 6%</td><td>1</td><td></td></tr><tr><td>≥ 12%</td><td>2</td><td></td></tr><tr><td>≥ 19%</td><td>3</td><td>Level 4</td></tr><tr><td>≥ 32%</td><td>4</td><td></td></tr><tr><td>≥ 44%</td><td>5</td><td></td></tr><tr><td>≥ 56%</td><td>6</td><td></td></tr><tr><td>≥ 70%</td><td>7</td><td></td></tr><tr><td>≥ 84%</td><td>8</td><td></td></tr><tr><td>≥ 100%</td><td>9</td><td>Level 5</td></tr><tr><td>Zero Net CO<sub>2</sub> Emissions</td><td>10</td><td>Level 6</td></tr></table>							Improvement over Building Regulations Part L (2013)	Credits	Mandatory Requirements	≥ 6%	1		≥ 12%	2		≥ 19%	3	Level 4	≥ 32%	4		≥ 44%	5		≥ 56%	6		≥ 70%	7		≥ 84%	8		≥ 100%	9	Level 5	Zero Net CO <sub>2</sub> Emissions	10	Level 6
	Improvement over Building Regulations Part L (2013)	Credits						Mandatory Requirements																																
	≥ 6%	1																																						
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	≥ 19%	3						Level 4																																
	≥ 32%	4																																						
	≥ 44%	5																																						
≥ 56%	6																																							
≥ 70%	7																																							
≥ 84%	8																																							
≥ 100%	9	Level 5																																						
Zero Net CO <sub>2</sub> Emissions	10	Level 6																																						
It is acceptable to average energy performance across a building containing multiple dwellings.																																								
The area weighted average DER and TER and must be calculated in accordance with the block averaging methodology defined in clauses 2.7and 2.16 of AD L1A.																																								



Issue	Credit Requirements	Credits			Responsible Party	Comments																																				
		Available	Target	Potential																																						
<b>Ene 2</b>  Fabric Energy Efficiency	Credits are awarded on a sliding scale. The scale is based on increments of 0.1 credits, distributed equally between the benchmarks defined in the table below: <table><tr><th colspan="4">Fabric Energy Efficiency (kWh/m²/year)</th></tr><tr><th>Apartment Blocks, Mid-Terrace</th><th>End Terrace, Semi-Detached &amp; Detached</th><th>Credits</th><th>Mandatory Levels</th></tr><tr><td>≤ 48</td><td>≤ 60</td><td>3</td><td></td></tr><tr><td>≤ 45</td><td>≤ 55</td><td>4</td><td></td></tr><tr><td>≤ 43</td><td>≤ 52</td><td>5</td><td></td></tr><tr><td>≤ 41</td><td>≤ 49</td><td>6</td><td></td></tr><tr><td>≤ 39</td><td>≤ 46</td><td>7</td><td>Levels 5 &amp; 6</td></tr><tr><td>≤ 35</td><td>≤ 42</td><td>8</td><td></td></tr><tr><td>≤ 32</td><td>≤ 38</td><td>9</td><td></td></tr></table>	Fabric Energy Efficiency (kWh/m²/year)				Apartment Blocks, Mid-Terrace	End Terrace, Semi-Detached & Detached	Credits	Mandatory Levels	≤ 48	≤ 60	3		≤ 45	≤ 55	4		≤ 43	≤ 52	5		≤ 41	≤ 49	6		≤ 39	≤ 46	7	Levels 5 & 6	≤ 35	≤ 42	8		≤ 32	≤ 38	9		9	5	-	HL	Updated SAP assessment from M & E confirm 5 credits targeted
Fabric Energy Efficiency (kWh/m²/year)																																										
Apartment Blocks, Mid-Terrace	End Terrace, Semi-Detached & Detached	Credits	Mandatory Levels																																							
≤ 48	≤ 60	3																																								
≤ 45	≤ 55	4																																								
≤ 43	≤ 52	5																																								
≤ 41	≤ 49	6																																								
≤ 39	≤ 46	7	Levels 5 & 6																																							
≤ 35	≤ 42	8																																								
≤ 32	≤ 38	9																																								
<b>Ene 3</b>  Energy Display Devices	Credits are awarded as follows: <table><tr><th>Criteria</th><th>Credits</th></tr><tr><td>Where current electricity OR <i>primary heating fuel</i> consumption data are displayed to occupants by a <i>correctly specified energy display device</i>.</td><td>1</td></tr><tr><td>Where current electricity AND primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device.</td><td>2</td></tr><tr><td>Default Cases Where electricity is the primary heating fuel and current electricity consumption data are displayed to occupants by a correctly specified energy display device.</td><td>2</td></tr></table>	Criteria	Credits	Where current electricity OR <i>primary heating fuel</i> consumption data are displayed to occupants by a <i>correctly specified energy display device</i> .	1	Where current electricity AND primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device.	2	Default Cases Where electricity is the primary heating fuel and current electricity consumption data are displayed to occupants by a correctly specified energy display device.	2	2	2	-	HL + Konnectiv	Both elec. and primary heating fuel consumption data to be displayed in each apartment.																												
Criteria	Credits																																									
Where current electricity OR <i>primary heating fuel</i> consumption data are displayed to occupants by a <i>correctly specified energy display device</i> .	1																																									
Where current electricity AND primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device.	2																																									
Default Cases Where electricity is the primary heating fuel and current electricity consumption data are displayed to occupants by a correctly specified energy display device.	2																																									
<b>Ene 4</b>  Drying Space	Credits are awarded based on the provision for drying space for each dwelling type as follows:  Where space with posts and footings or fixings capable of holding 4m+ of drying line for 1–2 bed dwellings, and 6m+ of drying line for 3+ bed dwellings, is provided for drying clothes. The space (internal or external) should be secure.	1	0	+1	Squire and Partners + Conran	31.03.2015 – to be reviewed to provide further margin. The potential of external drying space will also be considered.																																				
<b>Ene 5</b>  Energy Labelled White Goods	Where the following appliances are provided and have a rating under the EU Energy Efficiency Labelling Scheme:  - Fridges and freezers or fridge-freezers: <b>A+</b> <i>AND</i> - Information will be provided to each dwelling on the EU Energy Labelling Scheme to inform residents on how to select other energy efficient appliances.	1	1	-	Conran + Argent	Water-condenser washer/dryers use approx. 3 times the amount of water and are unlikely to meet the water use targets set out in Credit Wat 1  Air condenser washer/dryers are available with low enough water use to make meeting the maximum water use criteria (Wat1) possible.																																				



		Credits			Responsible Party	Comments
Issue	Credit Requirements	Available	Target	Potential		
	<p>Where the following appliances are provided and have a rating under the EU Energy Efficiency Labelling Scheme:</p> <ul style="list-style-type: none"><li>– Washing machines and dishwashers: <b>A</b></li></ul> <p><b>AND EITHER</b></p> <ul style="list-style-type: none"><li>– Washer-dryers or tumble driers: <b>B</b></li></ul> <p><b>OR</b></p> <ul style="list-style-type: none"><li>– Where washer-dryers or tumble driers are not provided, information on the EU Energy Labelling Scheme is provided to each dwelling where this is the case</li></ul> <p><b>AND</b></p> <ul style="list-style-type: none"><li>– That information will be provided to each dwelling on the EU Energy Labelling Scheme to inform residents on how to select other energy efficient appliances. It is also assumed that any washing machines, washer dryers or dishwasher are specified to be water efficient appliances (this is not directly related to the machines energy efficiency label, but is specified separately on the energy efficient label), please see the Wat 1 section for further information.</li></ul> <p>Note: Where washer dryers are provided it is not necessary to provide a washing machine to obtain this credit</p>	1	1	-	Squire and Partners + Conran + Argent	
	<p><b>OR</b></p> <ul style="list-style-type: none"><li>– A single credit can be awarded if no white goods are specified but information on the EU Energy Efficiency Labelling Scheme of efficient white goods is provided to each dwelling.</li></ul>	1	n/a	n/a	n/a	-
<b>Ene 6</b>	<p><u>Space Lighting</u></p> <p>1 credit can be awarded where all external space lighting, including lighting in common areas, is provided by energy efficient light bulbs / lamps with appropriate control systems</p> <p><i>Note: Statutory safety lighting is not covered by this requirement</i></p>	1	1	-	Squire and Partners + HL	-



Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
	<p><u>Security Lighting</u></p> <p>1 credit is awarded where all security light fittings are designed for energy efficiency and are adequately controlled such that:</p> <ul style="list-style-type: none"><li>- All burglar security lights have:<ul style="list-style-type: none"><li>o A maximum wattage of 150W;</li><li>o Movement detecting control devices (PIR), and</li><li>o Daylight cut-off sensors.</li></ul></li><li>- All other security lighting:<ul style="list-style-type: none"><li>o Has dedicated energy efficient fittings, and</li><li>o Is fitted with daylight cut-off sensors or timers</li></ul></li></ul> <p>If no security lighting is installed, then the security lighting credit can be awarded by default, provided all the conditions of the first issue covering space lighting have been met.</p> <p>Dual lamp luminaires with both space and security lamps can be awarded both credits provided they meet the above criteria for energy efficiency.</p>	1	1	-	HL	-
<p><b>Ene 7</b></p> <p>Low or Zero Carbon (LZC) Technologies</p>	<p>Credits are awarded based on the percentage reduction in total carbon emissions that result from using Low or Zero Carbon (LZC) Energy Technologies for each dwelling using the calculation method detailed in Calculation Procedures, with credits awarded as detailed below:</p> <ul style="list-style-type: none"><li>- 1 credit is awarded where energy is supplied from local renewable or low carbon energy sources funded under the Low Carbon Building Programme (or similar), or is designed and installed in a manner endorsed by a feasibility study prepared by an independent energy specialist</li></ul> <p>AND</p> <ul style="list-style-type: none"><li>- There is a 10% reduction in carbon emissions as a result of this method of supply.</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>- 2 credits are awarded if the above criteria are met and there is a 15% reduction in carbon emissions as a result of this method of supply.</li></ul>	2	2	-	HL	<p>Based on KX Triplets Stage D calculations for comparison.</p> <p>NB. Credit is based on a <i>Total carbon emissions</i> basis, which includes unregulated carbon emissions i.e. more onerous than the <i>regulated carbon</i> emissions that are considered at planning and in Part L.</p>

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
<b>Ene 8</b>  Cycle Storage	<p>Where individual or communal cycle storage is provided that is adequate, secure, convenient and weather-proof for the following number of cycles:</p> <p><b>1 credit</b></p> <ul style="list-style-type: none"> <li>Studio or 1 bedroom dwelling – storage for 1 cycle for every two dwellings</li> <li>2 and 3 bedroom dwellings – storage for 1 cycle per dwelling</li> <li>4 bedrooms and above – storage for 2 cycles per dwelling</li> </ul> <p><b>2 credits:</b></p> <ul style="list-style-type: none"> <li>studios or 1 bedroom dwellings – storage for 1 cycle per dwelling</li> <li>2 and 3 bedroom dwellings – storage for 2 cycles per dwelling</li> <li>4 bedrooms and above – storage for 4 cycles per dwelling</li> </ul>	2	2	-	Squire and Partners + HL	
<b>Ene 9</b>  Home Office	<p>1 credit is awarded where sufficient space and services have been provided which allow occupants to set up a home office in a suitable room, as defined in the Technical Guidance.</p> <p>Sufficient space is defined as the minimum size (1.8m wall length) to allow a desk, chair and filing cabinet or bookshelf to be installed, with space to move around the front and side of the desk, use the chair appropriately and operate the filing cabinet safely, (the 1.8m wall size requirement can, in some circumstances, be altered if drawings can prove that a desk can be fitted in any other type of arrangement, i.e. alcove or similar, fulfilling all the above criteria).</p> <p>Sufficient services must be provided in the suitable room intended as a home office:</p> <ul style="list-style-type: none"> <li>Two double power sockets</li> <li>Two telephone points (or double telephone point) or one telephone point where the dwelling is connected to cable services, or where broadband is available at the address</li> <li>Window (Note: The room chosen to be the nominated home office must have a daylight factor of at least 1.5%)</li> <li>Adequate ventilation, either through an openable window or with alternative ventilation such as passive stack, etc.</li> </ul> <p><u>'Suitable Room'</u></p> <p>For dwellings with three or more bedrooms, a suitable room is a room other than the kitchen, living room or, master bedroom or bathroom.</p> <p>For dwellings with one or two bedrooms or studio homes, a suitable room may be in the living room, one of the bedrooms or any other suitable area in the home such as a large hall or dining area (provided the minimum service requirements defined above are met).</p> <p>In all cases, the room must be large enough not to prevent the intended use of that room i.e. if a home office is to be set up in the main bedroom that room also needs to be able to fit in a double bed and other necessary furnishing.</p>	1	1	-	HL + Squire and Partners + Conran + HL Lighting (daylight assessment)	31.03.2015 – Façade glazing tbc therefore daylighting still to be reviewed.



Issue	Credit Requirements	Credits			Responsible Party	Comments																		
		Available	Target	Potential																				
<b>Wat 1</b>  Indoor Potable Water Use <b>(Mandatory)</b>	<p>Credits are awarded on the basis of average water consumption for the dwelling in accordance with the following criteria.</p> <p>The credits must be checked using the BRE Code Water Calculator Tool.</p> <table><tr><th>Credits</th><th>Water consumption (l/p/d)</th><th>Mandatory Levels</th></tr><tr><td>1</td><td>≤ 120</td><td>Level 1; Level 2</td></tr><tr><td>2</td><td>≤ 110</td><td></td></tr><tr><td>3</td><td>≤ 105</td><td>Level 3; Level 4</td></tr><tr><td>4</td><td>≤ 90</td><td></td></tr><tr><td>5</td><td>≤ 80</td><td>Level 5; Level 6</td></tr></table>	Credits	Water consumption (l/p/d)	Mandatory Levels	1	≤ 120	Level 1; Level 2	2	≤ 110		3	≤ 105	Level 3; Level 4	4	≤ 90		5	≤ 80	Level 5; Level 6	5	3	-	Argent + Conran	<p>105l/p/d can be achieved through water efficient fittings and appliances, without rainwater or greywater recycling.</p> <p>Refer to sanitary fittings note for guide approach to achieving targets</p> <p>Use of rain- or grey-water recycling could allow for an increase in fitting flow rate and potentially higher credit score.</p>
Credits	Water consumption (l/p/d)	Mandatory Levels																						
1	≤ 120	Level 1; Level 2																						
2	≤ 110																							
3	≤ 105	Level 3; Level 4																						
4	≤ 90																							
5	≤ 80	Level 5; Level 6																						
<b>Wat 2</b>  External Potable Water Use	<p>1 credit is awarded where a correctly specified and sufficient sized system to collect rainwater for external/internal irrigation use has been provided to a dwelling with a garden, patio or communal garden space (examples of such systems include rainwater butts and central rainwater collection systems).</p> <p>If no individual or communal garden spaces are specified or if only balconies are provided, the credit can be awarded by default.</p> <p>Requirements for apartments with private gardens are as follows: For 1-2 bedroom apartments – <u>150L minimum</u> For 3+ bedroom apartments – <u>200L minimum</u></p> <p>Requirements for compliance with communal garden provision – 1L per m² of land allocated to the dwelling with a <u>minimum of 200L per garden</u>. If the garden is allocated to more than 6 dwellings then a maximum of 30L per dwelling can be applied.</p> <p>Where planting requiring little water has been specified (following recommendation from a suitably qualified Ecologist), the above requirement can be halved* *subject to written confirmation from the Ecologist stating it is acceptable.</p> <p>A 50% reduction in storage requirements is permitted if terraces are covered entirely in hard landscaping.</p>	1	1	-	Squire and Partners + Ramboll + HL	<p>100litres needed for EACH terrace i.e. 100 litres on lower terrace and 100L pumped up to upper terrace</p> <p>Unless terraces are several terraces on each roof?</p> <p>Ramboll/Squire to confirm feasibility</p> <p>HL to investigate storage at lower terrace</p>																		

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
<b>Mat 1</b>  Environmental Impact of Materials. <b>(Mandatory)</b>	<p>It is mandatory at all code levels for at least three of the following five key elements achieve a relevant Green Guide rating from the 2007 version of <i>The Green Guide</i> of A+ to D:</p> <ul style="list-style-type: none"> <li>– Roof</li> <li>– External Walls</li> <li>– Internal Walls (including separating walls)</li> <li>– Upper and Ground Floors (including separating floors)</li> <li>– Windows</li> </ul> <p>Credits are awarded where the <i>Code Materials Calculator</i> is used to assess the number of credits awarded for the five key elements described above.</p>	15	6	Potential improvement to be identified.	Squire and Partners + Ramboll (recycled aggregates)	<p>Mid-range assumption. To be reviewed as design progresses.</p> <p>31.03.2015 – Mat 1 proforma sent to SP for investigating Mat 1 credits</p>
<b>Mat 2</b>  Responsible sourcing of materials: Basic Building Elements	<p>Credits achieved on a scale from 1 to 6 where 80% by volume of materials used in key building elements are responsibly sourced; i.e. responsible sourcing is demonstrated through an auditable third party certification scheme. The key building elements are:</p> <ul style="list-style-type: none"> <li>– Frame</li> <li>– Ground floor</li> <li>– Upper floors (including separating floors)</li> <li>– Roof</li> <li>– External walls</li> <li>– Internal walls (including separating walls)</li> <li>– Foundation/substructure</li> <li>– Staircase</li> </ul> <p>100% of any timber in these elements must be legally sourced.</p>	6	3	Potential improvement to be identified.	Contractor to advise once on board (G&T / Argent to include in ERs)	<p>Mid-range assumption. To be reviewed as design progresses.</p>
<b>Mat 3</b>  Responsible sourcing of materials: Finishing Elements	<p>Credits achieved on a scale from 1 to 3 where 80% by volume of materials used in secondary building and finishing elements are responsibly sourced. These are:</p> <ul style="list-style-type: none"> <li>– Stair</li> <li>– Window</li> <li>– External &amp; internal door</li> <li>– Skirting</li> <li>– Panelling</li> <li>– Furniture</li> <li>– Fascia</li> <li>– Any other significant use</li> </ul> <p>100% of any timber in these elements must be legally sourced.</p>	3	1	Potential improvement to be identified.	Conran + Contractor (G&T / Argent to include in ERs)	<p>Mid-range assumption. To be reviewed as design progresses.</p>



		Credits			Responsible Party	Comments
Issue	Credit Requirements	Available	Target	Potential		
<b>Sur 1</b>  Surface Water Runoff From Site  <b>(Mandatory)</b>	<p>The following requirement is mandatory at all Code levels:</p> <p><u>Peak Rate of Runoff</u> Ensure that the peak rate of runoff into watercourses is no greater for the developed site than it was for the pre-development site. This should comply with the Interim Code of Practice for Sustainable Drainage systems (SUDS) (CIRIA, 2004) or for at least the 1 year and 100 year return period events.</p> <p>Calculation Criteria:</p> <ul style="list-style-type: none"><li>- For sites of less than 200ha, the calculation of Greenfield runoff rates should be in accordance with Flood estimation for small catchments (Marshall and Bayliss, 1994) and any subsequent updates.</li><li>- For sites of 200ha and more, the calculation of Greenfield runoff rates should be in accordance with the Flood Estimation Handbook (Centre for Ecology and Hydrology, 1999) and any subsequent updates.</li><li>- An allowance for climate change should be made in accordance with current best practice (PPS25, 2006).</li></ul> <p><u>Volume of Runoff</u> Ensure that the additional predicted volume of rainwater discharge caused by the new development, for a 1 in 100 year event of 6 hour duration including an allowance for climate change (PPS25, 2006), is entirely reduced using infiltration.</p> <p><i>AND / OR</i></p> <p>Is made available for use in the dwelling as a replacement for potable water use in non-potable applications such as WC flushing or washing machine operation. Any residual additional rainwater volume that cannot be prevented from being discharged (reasons must be provided with supporting evidence), for all events up to the 100-year return period, the peak discharge rate from the site should be reduced to (in order of priority):</p> <ul style="list-style-type: none"><li>- A: the pre-development site's estimated mean annual flood flow rate (Qbar); or</li><li>- B: 2l/s/ha; or</li><li>- C: a minimum flow rate (litres per second), based on good practice guidelines to prevent easy blockage, by ensuring the outlet throttle is not too small; unless rainwater is being discharged to a public sewer or adopted surface water sewer, and there is a specific minimum requirement defined by the Sewerage Undertaker.</li></ul> <p>Note: reasons for discounting any of the options above must be provided with supporting evidence.</p>		<b>Mandatory</b>		PBA + Ramboll	Ramboll to confirm



Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
	<p>Two credits are available for using SUDS to improve water quality of the rainwater discharged or for protecting the quality of the receiving waters by:</p> <ul style="list-style-type: none"><li>- Ensuring no discharge to the watercourse for rainfall depths up to 5mm.</li><li>- Follow guidance in the Interim Code of Practice for Sustainable Drainage systems (SUDS), (CIRIA, 2004).</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>- Establish agreements for the ownership, long term operation and maintenance of all sustainable drainage elements used.</li></ul> <p>The mandatory requirements can be met by default if the site discharges rainwater directly to a tidal estuary or the sea, because compliance with discharge flow rate requirements will not be required.</p>	2	0	-	PBA + Ramboll	<p>For comparison: Not achieved at Block J. Targeted for KX Triplets Ramboll to confirm</p> <p>31.03.2015 - Argent are investigating the appointment of a suitable flood risk assessment for the entire site, which would include R3 and all other plots.</p>
Sur 2  Flood Risk	<p><i>EITHER</i></p> <ul style="list-style-type: none"><li>- 2 credits are available for developments situated in Zone 1 – low annual probability of flooding (as defined in PPS25 – ‘Planning and Flood Risk’) and where the site specific Flood Risk Assessment (FRA) indicates that there is low risk of flooding from all sources.</li></ul>	2	2	-	PBA + Ramboll	In line with other Code assessments at KXC
	<p>OR</p> <ul style="list-style-type: none"><li>- 1 credit is available for developments situated in Zones 2 and 3 – medium and high annual probability of flooding where the finished ground floor level of all habitable parts of dwellings and access routes to the ground level and the site, are placed at least 600mm above the design flood level of the flood zone.</li></ul> <p>The Flood Risk Assessment (FRA) accompanying the planning application must demonstrate to the satisfaction of the local planning authority and statutory body that the development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed.</p>	1	N/A	N/A	-	-

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
Was 1  Storage of non-recyclable waste and recyclable household waste  <b>(Mandatory)</b>	<p>The space allocated for waste storage should be able to hold containers with a volume of containers provided for waste storage should be at least the minimum recommended by British Standard BS 5906 (British Standards, 2005) i.e. 100 litres volume for a single bedroom dwelling, with a further 70 litres volume for each additional bedroom.</p> <p>A Local Authority recycling scheme offering containers equal to or greater than this volume would meet the requirement, providing adequate external space is allocated to accommodate them. If the Local Authority provides containers with a smaller volume, or if no Local Authority scheme exists, the developer will need to ensure and demonstrate that the minimum recommended volume is met.</p> <p>All containers must be accessible to disabled people (Checklist Was 1), particularly wheelchair users, and sited on a hard, level surface. To allow easy access, the containers must not be stacked.</p>	<b>Mandatory</b>			Squire and Partners + Conran + Arup (central waste provision)	Local Authority collection assumed (in line with other King's Cross assessments).
	<p><b>EITHER:</b> 2 credits are available for internal storage capacity for recyclable household waste</p> <p>Dedicated internal storage for recyclable household waste can be credited where there is no external storage for recyclable material, no Local Authority Collection Scheme and where the following criteria are met:</p> <ul style="list-style-type: none"><li>- At least, three internal storage bins:<ul style="list-style-type: none"><li>o All located in an adequate internal space</li><li>o No individual bin smaller than 15 litres</li><li>o Minimum total capacity 60 litres</li></ul></li></ul>	2	n/a	n/a	-	-
	<p><b>OR:</b> 4 credits are available where a combination of internal storage capacity is provided in an adequate internal space, with either a Local Authority Collection Scheme or adequate external storage.</p> <p>A <u>Local Authority collection scheme</u> must meet at least one of the following requirements:</p> <ul style="list-style-type: none"><li>- Where recyclable household waste is sorted after collection and at least a single 30 litre bin is provided in an adequate internal space (and with a collection of at least fortnightly)</li><li>- Where materials are sorted before collection and at least three separate bins are provided with 30 litres total capacity. Every bin provided must have at least 7 litres capacity and be located in an adequate internal space (and with a collection of at least fortnightly).</li><li>- An automated waste collection system which collects at least 3 different types of recyclable waste</li></ul>	4	4	-	Squire and Partners + Conran + Arup (central waste provision)	<p>In-line with other Code Assessments at KX</p> <p>30litre bin in dedicated location in addition to what is provided for general waste.</p> <p>S&amp;P/Conran/ Arup to confirm space requirements are achievable.</p> <p>31.03.2015 – SP to check central waste store provisions are in line with CSH requirements and to send a copy of the waste strategy to HL</p>





		Credits				
Issue	Credit Requirements	Available	Target	Potential	Responsible Party	Comments
	<p>External storage space, but <u>no Local Authority collection scheme</u></p> <p>There must be at least three identifiably different internal storage bins for recyclable waste, located in an adequate internal space:</p> <ul style="list-style-type: none"><li>- With a minimum total capacity of 30 litres</li><li>- Where every bin has at least 7 litres capacity</li><li>- All bins should be located within 30m* of an external door</li></ul> <p>AND</p> <ul style="list-style-type: none"><li>- For blocks of flats, a private recycling scheme operator must be appointed to maintain bins and collect recyclable waste regularly. Recycling containers must:<ul style="list-style-type: none"><li>o Be located in an adequate external space</li><li>o Be sized according to the frequency of collection, based on guidance from the recycling scheme operator</li><li>o Store at least 3 types of recyclable waste in identifiably different bins</li><li>o Be located within 30 m* of an external door.</li></ul></li></ul> <p>* Where strategic reasons outside the control of the developer make it impossible to meet this requirement, the maximum allowable distance is 50 m, and a written justification must be provided to the Code Service Provider.</p>					

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
<b>Was 2</b>  Construction Site Waste Management	<b>1<sup>st</sup> Credit - Minimising Construction Waste</b> Where there is a compliant Site Waste Management Plan (SWMP) that contains: <ul style="list-style-type: none"> <li>a. Target benchmarks for resource efficiency, i.e. m3 of waste per 100 m2 or tonnes of waste per 100 m2 set in accordance with best practice</li> <li>b. Procedures and commitments to minimize non-hazardous construction waste at design stage. Specify waste minimisation actions relating to at least 3 waste groups and support them by appropriate monitoring of waste.</li> <li>c. Procedures for minimising hazardous waste</li> <li>d. Monitoring, measuring and reporting of hazardous and non-hazardous site waste production according to the defined waste group</li> </ul> <b>2<sup>nd</sup> and 3<sup>rd</sup> Credit - Diverting Waste from Landfill</b> The Site Waste Management Plan must include procedures and commitments to sort and divert waste from landfill, through either; <ul style="list-style-type: none"> <li>- Re-use on site or on other sites</li> <li>- Salvage/reclaim for re-use</li> <li>- Return to the supplier via a 'take-back' scheme</li> <li>- Recovery and recycling using an approved waste management contractor</li> <li>- Compost</li> </ul> According to the defined waste groups (in line with the waste streams generated by the scope of works) <b>AND</b> One of the following has been achieved: <b>For 2 credits</b> - Where at least 50% by weight or by volume of non-hazardous construction waste generated by the project has been diverted from landfill.  <b>For 3 credits</b> - Where at least 85% by weight or by volume of non-hazardous construction waste generated by the project has been diverted from landfill.	3	3	-	Contractor (G&T / Argent to include in ERs)	-
<b>Was 3</b>  Composting	<ul style="list-style-type: none"> <li>- Individual home composting facilities.</li> </ul> OR <ul style="list-style-type: none"> <li>- A local communal or community composting service, which the Local Authority runs or where there is a management plan in place.</li> </ul> OR <ul style="list-style-type: none"> <li>- A Local Authority green/kitchen waste collection scheme, including an automated waste collection system.</li> </ul> All facilities must also: <ul style="list-style-type: none"> <li>- Be in a dedicated position</li> <li>- Be accessible to disabled people (Checklist 1)</li> <li>- Have an information leaflet that is delivered to each dwelling.</li> </ul>	1	1	-	Squire and Partners + Conran + Arup (central waste provision)	This credit was achieved at Block J via a local authority collection scheme  S&P/Arup to ensure that internal (7litre bin), central storage space requirements are achievable including additional chute as discussed.



Issue		Credit Requirements	Credits			Responsible Party	Comments												
			Available	Target	Potential														
Pol 1	Global Warming Potential (GWP) of Insulants	Credits are awarded where all insulating materials in the elements of the dwelling listed below only use substances that have a GWP < 5 (manufacture AND installation): <ul style="list-style-type: none"><li>Roofs: including loft access</li><li>Walls: internal and external including lintels and all acoustic insulation</li><li>Floors: including ground and upper floors</li><li>Hot water cylinder: pipe insulation and other thermal stores</li><li>Cold water storage tanks: where provided</li><li>External doors</li></ul>	1	1	-	Squire and Partners (envelope and acoustics)  + HL (services)	In line with other Code assessments at KX.												
Pol 2	NO <sub>x</sub> Emissions	Credits are awarded on the basis of NO <sub>x</sub> emission arising from the operation of all space heating and hot water systems for each dwelling type in accordance with the following criteria. <table><tr><th>Credits</th><th>Dry NO<sub>x</sub> level (mg/kWh)</th><th>Boiler class (BS EN 297: 1994)</th></tr><tr><td>1</td><td>≤ 100</td><td>4</td></tr><tr><td>2</td><td>≤ 70</td><td>5</td></tr><tr><td>3</td><td>≤ 40</td><td>-</td></tr></table> <b>Default Cases</b> 3 credits may be awarded where all space heating and hot water energy requirements are fully met by systems which do not produce NO <sub>x</sub> emissions.	Credits	Dry NO <sub>x</sub> level (mg/kWh)	Boiler class (BS EN 297: 1994)	1	≤ 100	4	2	≤ 70	5	3	≤ 40	-	3	3	-	Argent (Metropolitan - district energy scheme)	In line with other Code assessments at KX.
Credits	Dry NO <sub>x</sub> level (mg/kWh)	Boiler class (BS EN 297: 1994)																	
1	≤ 100	4																	
2	≤ 70	5																	
3	≤ 40	-																	
Hea 1	Daylighting	1 credit is awarded where kitchens achieve a minimum average daylight factor of at least 2%.  1 credit is awarded where all living rooms, dining rooms and studies (including any room designated as a home office under Ene 9 – Home Office) achieve a minimum average daylight factor of at least 1.5%.  80% of the working plane in each kitchen, living room, dining room and study (including any room designated as a home office under Ene 9 – Home Office) must receive direct light from the sky.	3	0	+1	Squire and Partners  + Conran  + HL Lighting	To be reviewed pending daylight assessment.  31.03.2015 – unlikely to achieve credits in all units and may require a combination hence only 1 potential credit. TBC pending fixed internal layouts followed by completion of the daylight assessment												

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
<b>Hea 2</b>  Sound Insulation	Credits are awarded for achieving higher standards of sound insulation than those given in Approved Document E of the Building Regulations for England and Wales (2003 Edition, with amendments 2004) as follows: 1 credit is awarded where: <ul style="list-style-type: none"> <li>Airborne and impact sound insulation values are at least 3 dB higher,</li> <li>Impact sound insulation values are at least 3dB lower</li> </ul> 3 credits are awarded where: <ul style="list-style-type: none"> <li>Airborne and impact sound insulation values are at least 5 dB higher</li> <li>Impact sound insulation values are at least 5dB lower</li> </ul> 4 credits are awarded where: <ul style="list-style-type: none"> <li>Airborne and impact sound insulation values are at least 8 dB higher</li> <li>Impact sound insulation values are at least 8dB lower</li> </ul> This can be demonstrated through: <i>EITHER</i> <ul style="list-style-type: none"> <li>A programme of pre-completion testing based on the Normal programme of testing described in Approved Document E, for every group or sub-group of houses or flats, demonstrating that the above standard or standards are achieved.</li> </ul> <i>OR</i> <ul style="list-style-type: none"> <li>Use of constructions for all relevant building elements that have been assessed and approved by Robust Details Limited (RDL), and found to achieve the performance standards stated above and all relevant dwellings are registered with RDL.</li> </ul>	4	3		HL Acoustics + Squire and Partners	Team to confirm target score pending discussions with HL Acoustics.  31.03.2015 – potential credit no longer an option (preference for increased NSA)
<b>Hea 3</b>  Private Space	1 credit is awarded where outdoor space (private or semi-private) has been provided that is: <ul style="list-style-type: none"> <li>Of at least a minimum size that allows all occupants to sit outside: <ul style="list-style-type: none"> <li>Private space requirement is at least 1.5 m<sup>2</sup> per bedroom.</li> <li>Shared space requirement is at least 1.0 m<sup>2</sup> per bedroom.</li> </ul> </li> <li>Allows easy access by all occupants, including wheelchair users</li> <li>Access for wheelchair users should conform to “BS8300 Design of buildings and their approaches to meet the needs of disabled people – Code of practice”.</li> <li>Accessible only to occupants of designated dwellings</li> </ul> The space must be designed in a way that makes it clear that the space is only to be used by occupants of designated dwelling(s). This could be achieved by using the buildings themselves, fencing, planting or other barrier to seal off the space.	1	1	-	Squire and Partners	Apartments with a balcony will achieve this credit providing balconies are adequately sized. Any apartments that do not have a balcony could achieve the credit via shared communal gardens / roof terraces. S&P to confirm space requirements can be met  31.03.2015 – following review of criteria with SP this will remain targeted.
<b>Hea 4</b>  Lifetime Homes	4 credits are awarded where all the principles of Lifetime Homes, applicable to the dwelling being assessed, have been complied with.	4	4	-	Squire and Partners + Conran	31.03.2015 – following review of criteria with SP all credits will remain targeted.

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
Man 1 Home User Guide	2 credits are awarded for the provision, in each home, of a simple guide that covers information relevant to the non-technical tenant/owner on the operation and environmental performance of their home, compiled using Checklist Man 1 Part 1 together with information that the guide is available in alternative accessible formats.	2	2	-	Argent + Contractor (G&T / Argent to include in ERs)	
	1 further credit is awarded where the guide also covers information relating to the site and its surroundings, compiled using Checklist Man 1 Part 2.	1	1	-	Argent + Contractor (G&T / Argent to include in ERs)	
Man 2 Considerate Constructors Scheme	<p><b>1 credit</b> is awarded where there is a commitment to meet Best Practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme. In the Considerate Constructors Scheme this equates to a score of at least 5 in each of the 5 sections and an overall score between 25 and 34.</p> <p><b>2 credits</b> are awarded where there is a commitment to go significantly beyond Best Practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme. In the Considerate Constructors Scheme this equates to a score of at least 7 in each of the 5 sections and an overall score between 35 and 50.</p>	2	2	-	Contractor (G&T / Argent to include in ERs)	In line with other Code assessments at KX.
Man 3 Construction Site Impacts	<p>1 credit is awarded where procedures that cover 2 or more of the following items are set up in line with the requirements of the technical guide of the Code for Sustainable Homes:</p> <ul style="list-style-type: none"> <li>Monitor, report and set targets for CO<sub>2</sub> production or energy use arising from site activities.</li> <li>Monitor and report CO<sub>2</sub> or energy use arising from commercial transport to and from site.</li> <li>Monitor, report and set targets for water consumption from site activities.</li> <li>Adopt best practice policies in respect of air (dust) pollution arising from site activities.</li> <li>Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site.</li> <li>80% of site timber is reclaimed, reused or responsibly sourced.</li> </ul> <p>2 credits are awarded where procedures that covers 4 or more of the items listed above are set up in line with the requirements of the technical guide of the Code for Sustainable Homes.</p>	2	2	-	Contractor (G&T / Argent to include in ERs)	In line with other Code assessments at KX.

Issue	Credit Requirements	Credits			Responsible Party	Comments
		Available	Target	Potential		
<b>Man 4</b>  Security	2 credits are achieved by complying with "Section 2 – Physical Security" from 'Secured by Design New Homes'  <i>AND</i>  Where an Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the local police force is consulted at the design stage and their recommendations are incorporated into the design of the dwelling (an actual <i>Secured by Design</i> Certificate is not required).	2	0	+2	Squire and Partners + Argent	S&P to confirm credit approach pending discussions with ALO  Credit not expected to be met in line with other Code assessments.  31.03.2015 – SP to confirm comments from security consultant + ALO to check if potential credits are possible
<b>Eco 1</b>  Ecological Value of Site	1 credit is awarded where the <i>development site</i> is confirmed as land of inherently <i>low ecological value</i> .  <i>EITHER</i> - By meeting the criteria for <i>low ecological value</i> (using <i>Checklist Eco 1 – Land of Low Ecological Value</i> under <i>Checklists and Tables</i> below) <i>OR</i> - By being confirmed by a <i>Suitably Qualified Ecologist</i> . <i>OR</i> - Where an independent ecological report of the site, prepared by a <i>Suitably Qualified Ecologist</i> , states that the <i>construction zone</i> is of low or insignificant ecological value <i>AND</i> - Any land of ecological value outside the <i>construction zone</i> but within the <i>development site</i> will remain undisturbed by the construction works.	1	1	-	RPS	Pending Ecologist survey findings from re-visit to site
<b>Eco 2</b>  Ecological Enhancement	1 credit is awarded where a <i>Suitably Qualified Ecologist</i> has been appointed to recommend appropriate ecological features that will enhance the ecology of the site.  <i>AND</i>  Where the developer adopts all key recommendations and 30% of additional recommendations.	1	1	-	RPS + Squire and Partners + Argent	Pending ecologist survey findings and recommendations
<b>Eco 3</b>  Protection of Ecological Features.	1 credit is awarded where all existing features of ecological value on the development site potentially affected by the works, are maintained and adequately protected during site clearance, preparation and construction works.  The credit can be awarded by default where the site has been classified as having <i>low ecological value</i> in accordance with <i>Section 1 of Checklist Eco 1, Ecological features of the site</i> and no features of ecological value have been identified. Additionally if a <i>Suitably Qualified Ecologist</i> has confirmed a feature can be removed due to insignificant ecological value or poor health/condition (e.g. diseased trees which require felling, either for health and safety and/or conservation reasons), the credit can be achieved provided all other features are adequately protected in accordance with the ecologist's recommendations.	1	1	-	RPS + Contractor (G&T / Argent to include in ERs)	Pending ecologist survey findings



Issue		Credit Requirements	Credits			Responsible Party	Comments										
			Available	Target	Potential												
Eco 4	Change of Ecological Value of Site	<p>Credits are awarded where the resulting change in ecological value is as follows:</p> <table><tr><th>Credits</th><th>Requirement</th></tr><tr><td>1</td><td>For a change of ecological value of between –9 and –3 natural species</td></tr><tr><td>2</td><td>For a change of ecological value of between -3 and 3 natural species</td></tr><tr><td>3</td><td>For a change of ecological value of between +3 and +9 natural species</td></tr><tr><td>4</td><td>For a change of ecological value of greater than +9 natural species</td></tr></table>	Credits	Requirement	1	For a change of ecological value of between –9 and –3 natural species	2	For a change of ecological value of between -3 and 3 natural species	3	For a change of ecological value of between +3 and +9 natural species	4	For a change of ecological value of greater than +9 natural species	4	2	+1	RPS + Squire and Partners + Argent	Pending ecologist survey findings and recommendation
Credits	Requirement																
1	For a change of ecological value of between –9 and –3 natural species																
2	For a change of ecological value of between -3 and 3 natural species																
3	For a change of ecological value of between +3 and +9 natural species																
4	For a change of ecological value of greater than +9 natural species																
Eco 5	Building Footprint	<p><b>1 Credit</b></p> <ul style="list-style-type: none"><li>For houses: Where the Net Internal Floor Area: Net Internal Ground Floor Area ratio is greater than 2.5:1</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>For blocks of flats: Where the Net Internal Floor Area: Net Internal Ground Floor Area is greater than 3:1</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>For a combination of houses and flats, a ratio of total net Internal Floor area : total ground floor area greater than the area weighted average of the two ratios above</li></ul> <p><b>2 Credits</b></p> <ul style="list-style-type: none"><li>For houses: Where the Net Internal Floor Area: Net Internal Ground Floor Area ratio is greater than 3:1</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>For block of flats: Where the Net Internal Floor Area: Net Internal Ground Floor Area is greater than 4:1</li></ul> <p>OR</p> <ul style="list-style-type: none"><li>For a combination of houses and flats, a ratio of total Net Internal Floor Area : Total Ground Floor Area greater than the area weighted average of the two ratios above.</li></ul>	2	2	-	Squire and Partners	-										
		<b>Total Score</b>		69.21% ‘Level 4’	75.11% ‘Level 4’	≥ 68% is required to achieve Code for Sustainable Homes Level 4											



5.0 Appendix B: Supporting information

This appendix is provided as supporting information.

5.1 Code for sustainable homes (CfSH) process

Figure 5.1 indicates the CfSH process from appointment of the assessor, through to receipt of a post-construction certificate.

5.2 How the score is calculated

Each category is subject to a weighting factor to reflect their relative importance. The credits with the highest weighted value are in the Water, Ecology and Energy categories. The credits with the lowest weighted value are in the Materials category. Table 5.1 identifies the value of the credits in each category.

The weighted final points score determines the CfSH level achieved, provided all relevant mandatory criteria are met.

Under the CfSH each individual dwelling requires its own assessment and rating. A single rating cannot be awarded across a complete residential development where differences in the specification of individual dwellings exist.

Table 5.1: Value of Each Credit

Category	Value of one Credit
Water	1.50
Ecology	1.33
Energy and CO <sub>2</sub> Emissions	1.17
Health & Wellbeing	1.17
Management	1.11
Waste	0.80
Pollution	0.70
Surface Water Run-off	0.55
Materials	0.30

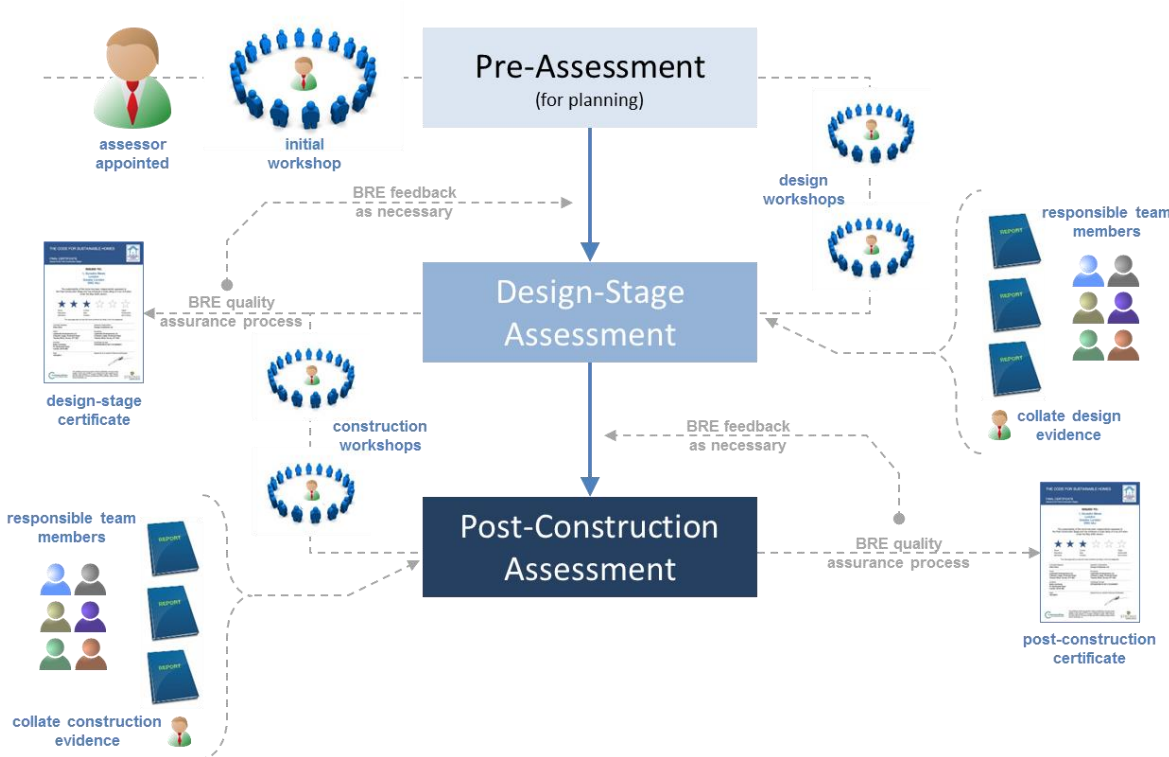


Figure 5.1: Summary of CfSH process





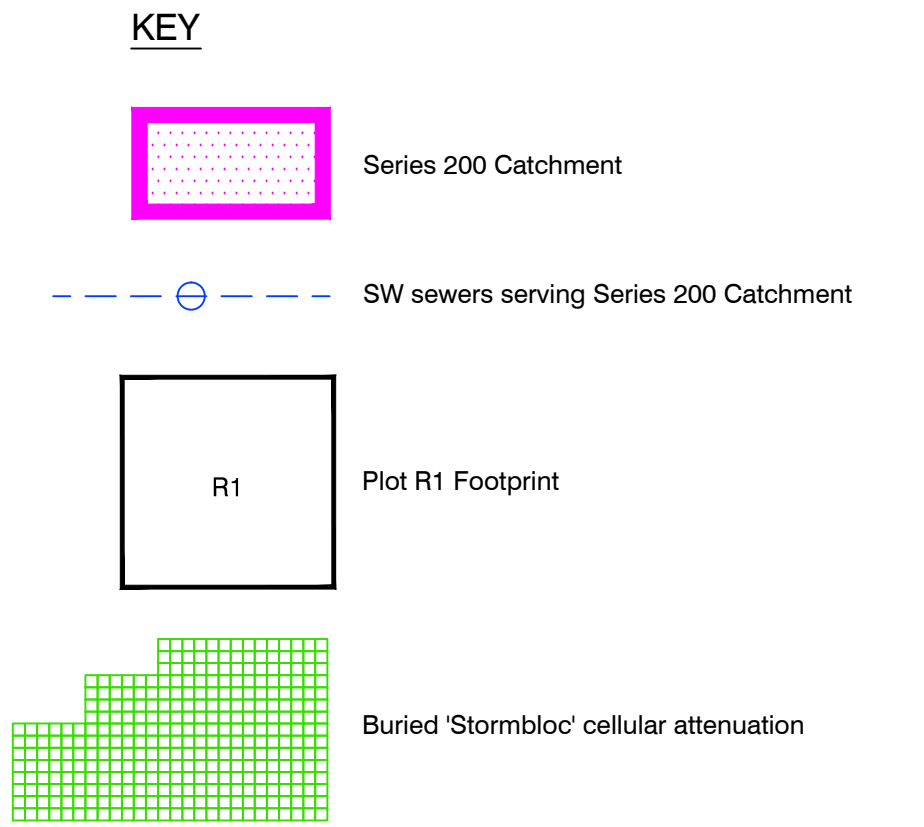
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## APPENDIX D

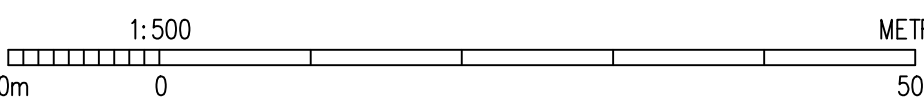
DRAINAGE LAYOUTS: 20227-007-500-05 & 20227-007-500-06



- KEY**
- Maximum peak (storm & foul) discharge permissible for the Kings Cross Central site as a whole must not exceed 2292 l/s in accordance with planning consent Ref. 2004/2307/P, condition 45.
  - Drawing 2022/007/500/06 and associated S106 connection summary shows each catchment connection to the existing sewer infrastructure and associated peak storm & foul flows demonstrating compliance with condition 45.
  - Each new storm water system comprise online and offline attenuation in the form of oversized pipes and modular underground storage system as well as flow control devices to buffer peak flows generated down to the discharge rates to that mentioned in note 2 above.
  - Refer to drawing 2022/007/500/06 for Plot R1/Catchment 200 Foul Water drainage layout.



- Residual Risks**
- Normal construction risks which a competent contractor would be expected to identify have not been listed.
- 400kV underground cable along tow path.
  - Unexploded ordnance
  - Tow path existing retaining wall stability
  - Hot spots of underground contamination
  - Transit Street existing retaining wall stability
  - Subterranean tunnels - private and Network Rail
  - Interface with public highway
  - Existing and proposed utilities
  - Work on live sewer
    - Confined spaces
    - Deep connections
    - Floodation from existing flows
  - Regents canal



Mark	Revision	Drawn	Date	Chkd
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SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

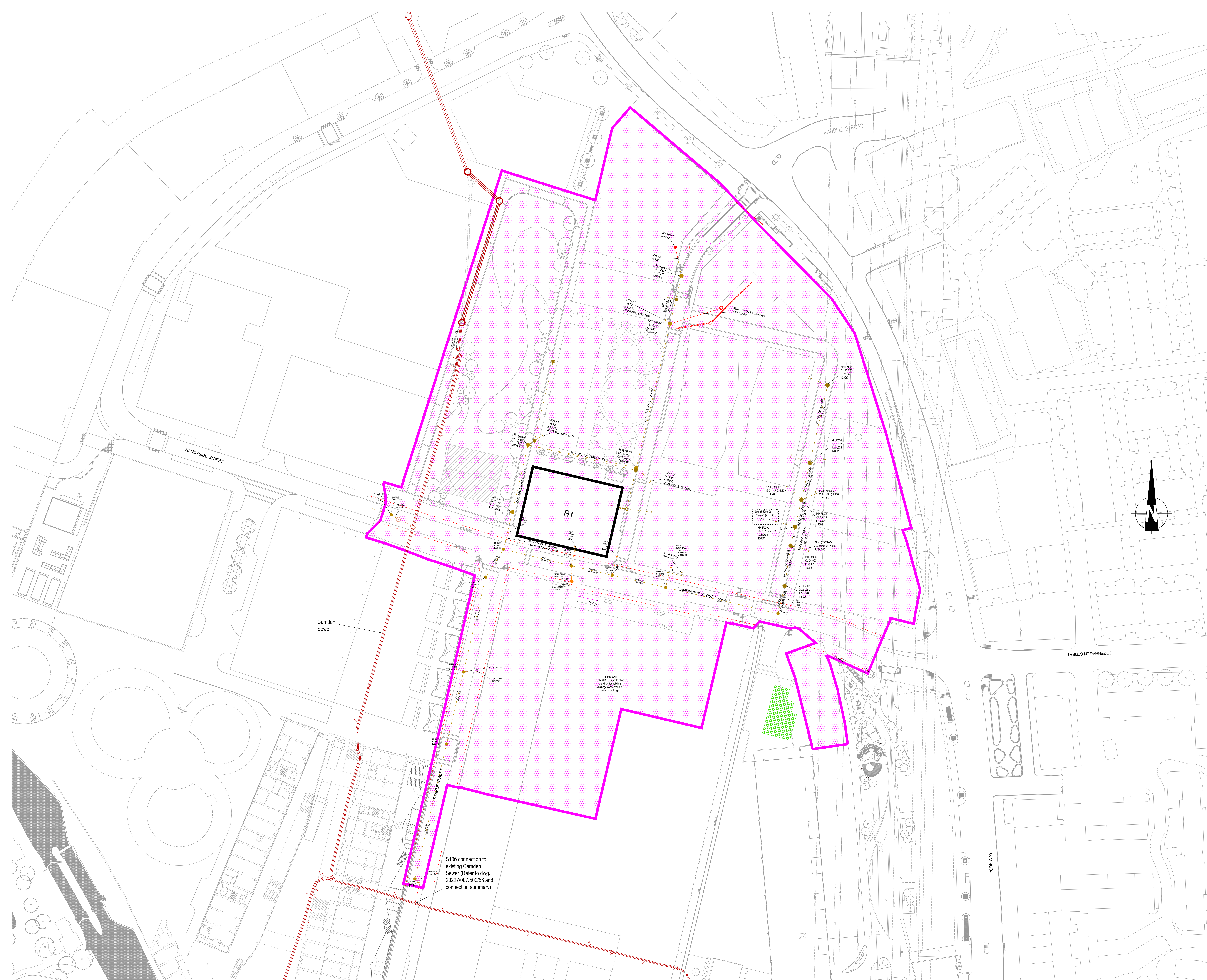
Drawing Issue Status

**FOR INFORMATION**

**KINGS CROSS CENTRAL  
PLOT R1/CATCHMENT 200  
SURFACE WATER DRAINAGE LAYOUT**

Client <b>KINGS CROSS CENTRAL LIMITED PARTNERSHIP</b>		pba peterbrett	
Date of first issue 16.06.15	Drawn by MG	Offices throughout the UK and Europe <b>www.peterbrett.com</b> © Peter Brett Associates LLP AB00000 Tel: 01233 651740	
As Scale 1:500	Checked by CA		
Drawing Number 2022/007/500/05	Revision		





### KEY

1. Maximum peak (storm & foul) discharge permissible for the Kings Cross Central site as a whole must not exceed 2282 l/s in accordance with planning consent Ref. 2004/2307/P, condition 45.
2. Drawing 2022/07/500/56 and associated S106 connection summary shows each catchment connection to the existing sewer infrastructure and associated peak storm & foul flows demonstrating compliance with condition 45.
3. Each new storm water system comprise online and offline attenuation in the form of oversized pipes and modular underground storage system as well as flow control devices to buffer peak flows generated due to the discharge rates that mentioned in note 2 above.
4. Refer to drawing 2022/07/500/05 for Plot R1/Catchment 200 Surface Water drainage layout.

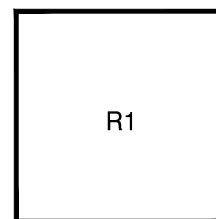
KEY



Series 200 Catchment

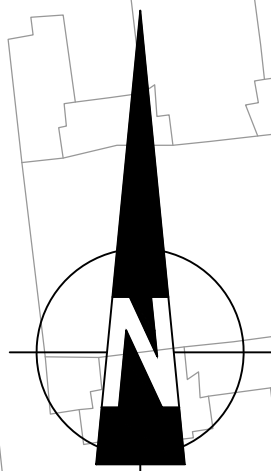


FW sewers serving Series 200 Catchment



Plot R1 Footprint

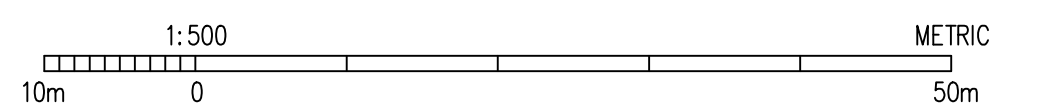
### Buried 'Stormbloc' cellular attenuation



### Residual Risks

Normal construction risks which a competent contractor would be expected to identify have not been listed.

- 400kV underground cable along tow path.
- Unexploded ordnance
- Tow path existing retaining wall stability
- Hot spots of underground contamination
- Transit Street existing retaining wall stability
- Subterranean tunnels - private and Network Rail
- Interface with public highway
- Existing and proposed utilities
- Work on live sewer
  - Confined spaces
  - Deep connections
  - Inundation from existing flows
- Regents canal



A	Drainage layout amended in between Plot R7/8A and Q1/Q2.	MG	18.06.15	IM	
Mark	Revision	Drawn	Date	Chk	

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR INFORMATION

KINGS CROSS CENTRAL  
PLOT R1/CATCHMENT 200  
FOUL WATER DRAINAGE LAYOUT

Client  
KINGS CROSS  
CENTRAL LIMITED  
PARTNERSHIP

Date of 1st Issue 16.06.15	Drawn by MG
A0 Scale 1:500	Checked by CA

Drawing Number	Revision
20227/007/500/06	A



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