5.19 Management & maintenance

5.19.1 Maintenance

The primary aim is to manage the landscape spaces so that they thrive and are able to continue to provide their green infrastructure functions, including cultural ecosystem services, such as providing sense of place and amenity.

The following key factors will need to be addressed in order to sustain high-quality external spaces:

- Safety
- Cleanliness
- Repair and replacement
- Horticulture health
- Hard surfaces
- Playable space
- Delivery

5.19.2 Safety & security

A safe environment is one that is accessible to all. As well as adopting 'Secured by Design' principles in the design of the landscaped areas, long-term management and maintenance of the landscape proposals will be required.

Well-maintained places are less likely to suffer from crime as they are more likely to be used, thus increased presence will deter antisocial behaviour. Passive surveillance will be encouraged with landscaping, enabling clear visibility along main pedestrian routes.

Private gardens are enclosed with 1.2m walls and accessed via secured gates.

5.19.3 Cleanliness

Cleanliness is the principal indication of the quality of management of the landscape design. It will be important to maintain the cleanliness of the landscape with regular collection and removal of leaves, debris and litter.

5.19.4 Repairs & replacement

The need for repair and replacement of finishes will be mitigated by the use of appropriate and durable materials. Nevertheless, in the long-term, a degree of maintenance and replacement is unavoidable.

5.19.5 Horticulture health

The health and general condition of planted areas, including trees, shrubs and perennial plants and lawns, is clearly indicative of the level of care and attention a place receives.

Planting, including any replacements to dead or dying material, will be maintained in accordance with a Landscape Maintenance Specification.

Trees, climbers and shrubs will undergo inspections which will provide informative pruning to ensure appropriate habit and form, monitor health of trees and the removal of dead, dying or diseased branches as required.

Once established, the removal of stakes / guying systems will be required where necessary. Shrub beds will receive ongoing maintenance to ensure weed-free conditions through combined techniques of hand weed removal, chemical-free herbicides, cultivation and mulching.

Until fully established, new trees and shrubs will require adequate watering. An irrigation system will be required for establishment of plants and trees and for ongoing watering during prolonged periods of drought.

5.19.6 Hard surfaces

Seasonal maintenance of fallen leaves, snow and de-icing is required, and combined use of herbicides and hands to remove weeds that grow within paving or other hard surface joints.

5.19.7 Delivery

Delivery of the landscape scheme will be by appropriately skilled and experienced contractors and specialist contractors, in accordance with BS3936:1992, BS4043:1989 and BS4428:1989 (or subsequent superseding equivalent) and current arboricultural best practice, working to tight specifications and fully resolved designs.

Particular attention will be paid to the sourcing of both hard and soft landscape material, and the customising of specifications and workmanship to best suit these materials, which will be locally sourced where possible.

The landscape construction contract will include 12-months post-practical completion establishment maintenance before handing over to the ongoing management team.

5.19.8 Water

Planting is generally intended to be suitable for minimal watering. Irrigation in the public realm is carried out manually with a hosepipe during establishment and then as required.

A separate irrigation system is required on the podium with a drip line fed through the planting beds to irrigate the softscape planting beds.

5.19.9 Lighting & electrical

For security lighting and lux levels, please refer to the MEP design report.


Bakers Yard
Units A - D

6.1 Transport & parking

Car parking

The scheme provides a total of 83 residential car parking spaces (incl. 8 accessible) and 20 industrial car parking spaces (incl. 5 accessible) with 4 industrial loading bays and 1 car-club parking space. All surface and below podium spaces will be allocated to a specific dwelling. Accessible spaces are included within this allocation and are provided in close proximity to the accessible apartments or on the accessible house type driveway. All future residents will not be permitted CPZ permits via S106.

This is distributed as follows:
19 private spaces on drive (of which 2 are accessible)
9 integrated garage spaces
20 allocated spaces below podium (of which 2 are accessible and 2 are for visitors)
35 allocated surface spaces (of which 4 are accessible)
20 allocated spaces for the industrial space (of which 5 are accessible)
4 loading bays (which accommodate 10m HG vehicles)
1 car-club space

Cycle parking

In compliance with the London Plan 2021 the scheme provides a total of 196 residential cycle spaces, 6 visitor cycle spaces, and 16 industrial cycle spaces. Houses have secure cycle storage within internal garages or in external stores, and apartments have dedicated cycle stores within each building in the form of two tier cycle racks, as well as accessible Sheffield stands in the public realm and car park.

These are broken down as follows:
50 spaces at 1.5 spaces per dwelling for all 1 beds (5 accessible)
128 spaces at 2 per dwelling for all 2 beds and 3 beds (13 accessible)
18 additional spaces within residential
6 spaces at 2 per initial 40 dwellings and 1 per additional 40 dwellings for visitors
5 spaces at 1 per 250sqm for industrial workers and 1 per 1000sqm for visitors
11 additional spaces within the industrial

The proposals includes several improvements to the transport offering of the existing site facilitating both pedestrian and vehicle flow through the site. The residential development to the north of the site will provide an internal road access from Gould and Crane Road. The industrial development to the south of the site will utilise the existing road access from Edwin Road. A security gate will permit access for refuse and emergency vehicles.

A two-way street is proposed in both parts of the site for general vehicles. Given the low traffic volumes, low speeds and residential nature of the site, 3.7m points with clear visibility and passing points are proposed. The removal of the existing site access gates to the residential element and new pedestrian foot-way facilitates pedestrian accessibility through the site and enhances connectivity to the river. Both the industrial and residential elements of the site provide a level of car and cycle parking which is compliant with local parking standards, prevents overspill parking and encourages adoption of sustainable and green travel. The development is well placed for public transport, with several bus routes and rail connections within reasonable walking distance of the site. (PTAL 2 rating)

The proposal includes a car club space within immediate proximity of the development provides a further transport offering. As a borough, Richmond upon Thames advocates car clubs as an alternative to private motor car, promoting their integration across the council website. The new car club bay facilitated by the development would not be exclusively for the use of residents at the site, and would thus providing a communal benefit for surrounding residential properties. The implementation of the car cub bay would be agreed with the developer, car club provider and Local Authority, as a condition of consent.

Parking and transport diagram

6.2 Refuse, recycling & servicing strategy

The new internal roads will enable all refuse collection, residential deliveries and maintenance vehicles access to set-down and collect from within the site. The security gate joining the two-way internal access roads ensures that all refuse and emergency service vehicles will be able to access and egress the site in a forward gear.

Storage for wheelie bins is located within defined private stores for each house along the mews terrace. For the apartments and the houses adjacent to the river, shared refuse and recycling stores are provided, which meet the council's required drag distances and collection volumes.

The refuse storage provision is based on the London Borough of Richmond Upon Thames Refuse and Recycling Storage Requirements supplementary planning document and allows for the following storage provision:

Waste

Houses / developments with individual refuse containers:
Storage capacity of 240 litres for refuse per household of three bedrooms or fewer
Storage capacity of 360 litres for refuse per household of more than three bedrooms

Developments using communal refuse storage containers:
Storage capacity of 70 litres per bedroom. This requirement relates to communal waste containers.

Recycling

Houses and developments of up to two units:
Storage capacity for two 55 litre recycling boxes.
Space must be provided so that the boxes can be presented within the property boundary and be visible from the kerbside on collection day.

Number of households served by bin area	Mixed paper, card and carton recycling bins	Mixed container recycling bins	Total recycling bins
3 to 5	1x 240L	1x 240L	2x 240L
7 to 8	1x 360L	1x 360L	2x 360L
9 to 11	2x 240L	2x 240L	4x 240L
12 to 17	2x 360L	2x 360L	4x 360L
18 to 25	1x 1100L	1x 1100L	2x 1100L
26 to 45	2x 1100L	2x 1100L	4x 1100L
46 to 70	3x 1100L	3x 1100L	6x 1100L

Refuse vehicle tracking diagram

Refuse store locations and refuse vehicle tracking diagram

6.3 Mechanical, electrical & public health

The following summary is provided by Desco. For a full understanding of the proposed MEP strategy please refer to the separate 'Energy Strategy' and 'Utilities Connection Report' submitted alongside this application.

"Following the disconnection of existing services and the demolition of the existing buildings on the site, new incoming services will be installed to serve the new development, including the installation of a new substation.

The services strategy for the site has been developed to meet the both London Plan targets and compliance with building regulations. The key overall targets focus on energy efficiency, CO2 emissions, water conservation and sustainable drainage. In summary, the proposed development incorporates a number of improvements which combine to demonstrate a high degree of sustainability and an improvement in reducing the site wide carbon emissions by at least 35% more than the building regulations compliance target.

Heating and hot water generation to the residential apartment buildings shall be provided through the use of Low Zero Carbon Technologies (LZC). A centralised reversible air source heat pump and condenser water loop will be installed, distributed to each apartment. The centralised plant comprises 2No. 200kW reversible air source heat pumps, a dry air cooler, thermal store, pressurisation unit and circulation pumps.

Individual heat pumps connected to the condenser water loop in each apartment, provide hot water generation via hot water storage cylinders and heating via fan assisted radiators. The heat pumps shall have both a heating and cooling facility, the latter being utilised to reduce the risk of overheating.

The townhouses will be served by standalone split air source heat pump systems to provide both heating and tempered cooling and hot water via hot water storage cylinders.

Mechanical Ventilation to both the apartments and townhouses, will utilise System 4 Mechanical Ventilation with Heat Recovery (MVHR), see figure 3. As detailed in the overheating report, the MVHR units will provide elevated air change rates/ summertime boost in the townhouses, to prevent the risk of overheating occurring within all habitable rooms. During periods outside of high external ambient temperatures the ventilation systems will operate using trickle/boost facilities in order to meet the ventilation criteria set out in approved document Part F.

Potable water will be supplied to each apartment via a central storage tank and cold water booster set, to ensure adequate water pressures at each outlet.
Potable water to each of the townhouses, will be fed directly from the new mains water supply from Thames Water. Landlord's water supplies will be provided to bin stores and irrigation points.

From a fire and life safety perspective, it is envisaged category 2 sprinklers will be installed in all open plan apartments, utilising combined potable water tank/pumps. However this is to be confirmed following issue of the fire strategy. Smoke extract ventilation shall be provided to the apartment building corridors as defined in fire report. Dry risers will be installed in each core of each apartment building. Smoke/Heat detection will be installed throughout each dwelling. A standby generator or secondary Electrical supply for fire fighting and smoke vent equipment will be installed, to be confirmed by fire strategy.

Metered mains Low Voltage (LV) electrical distribution and containment will distribute to all landlord services and apartments. The Landlord LV distribution will serve common area lighting, small power, lifts, mechanical services, door and main gate entry, Satellite/TV/DAB distribution systems. The common area lighting will comprise LED lighting and escape lighting. The common area small power will distribute to cleaners sockets and equipment. In the apartment buildings Satellite/TV/DAB outlets will be installed, there will also be a Video/audio door and main gate entry system installed in each apartment.

Individual LV electrical supplies shall be provided to each of the town houses, with meters installed in line with the local DNO's requirements. Like the apartment buildings Satellite/TV/DAB outlets will be installed in the houses.

In both the townhouses and apartments, distributing from the dedicated electrical consumer unit for the dwelling, small power circuits serving socket outlets, kitchen equipment, MVHR and heat pumps, fan assisted radiators will be provided. LED downlights will be installed throughout the dwellings. A BT and or other supplier, fibre network will be provided to serve all apartments and townhouses, with fibre termination points installed in all dwellings.

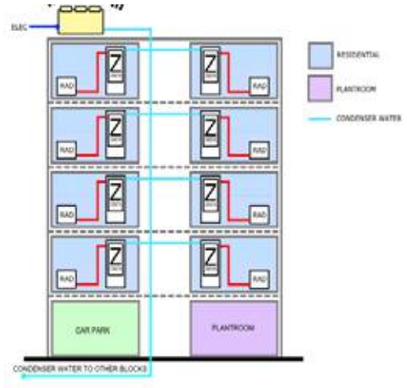
Site wide, a CCTV system shall be installed at main points of entry to the site and each apartment building. External lighting shall be installed throughout the site as set out in the external lighting report.

The shell and core industrial space will be provided with capped off incoming services. The units will be individually served by Daikin Altherma 3 Air Source Heat Pumps, feeding radiant panel heaters to provide space heating. Such systems are electrically driven and utilise very good coefficient of performance to minimise running costs and C02 emissions. The size and nature of the industrial units are well suited to this type of system and it is anticipated that proposed tenants would expect to install such a system as part of their fit out if required.

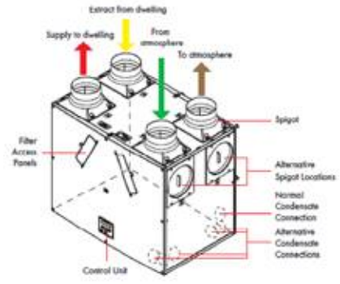
As detailed in the site wide Energy Strategy report, it is proposed Photovoltaic cells will be installed to the roof of each townhouse and the industrial building identified on the site plan below. The provision of photovoltaic cells shown is to ensure the site wide carbon emissions improvement is maximised."

Apartment building system illustration

Apartment building system illustration



Apartment building system illustration



MVHR unit

Photovoltaic panel locations

6.4 Overheating mitigation

The following summary is provided by Desco. For a full understanding of the proposed overheating mitigation strategy please refer to the separate 'Overheating Report' submitted alongside this application.

"An overheating analysis of all the habitable rooms in the residential apartments and townhouses was carried out to demonstrate the predicted thermal performance and the predicted temperatures that occupants using the building will expect. Please refer to the overheating report for all results.

The analysis has been based on CIBSE Technical Memorandum 59 (TM59) 'Design methodology for the assessment of overheating risk in homes'.
The criteria is as follows:

1. For all habitable rooms the number of hours during which ΔT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours.
2. In bedrooms the room temperature shall not exceed 26°C for more than 1% of annual hours, between the hours of 10PM and 7AM.
3. For Homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e. all occupied rooms should not exceed 26˚C for more than 3% of annual occupied hours.

The overheating report concentrates on 3 alternative methods to prevent overheating and comply with the set criteria.

- Natural ventilation through use of openable windows.
- Enhanced mechanical ventilation with summertime boost.
- Tempered cooling to all bedrooms and Living Rooms.

The GLA additionally require the building to be tested against three different weather files Design Summer Year (DSY)1, DSY2 and DSY3 weather files in line with TM49. DSY1 represents a typical summer year, DSY 02 and 03 do not represent typical summer time temperature and weather profiles, they are historic and the theory is that these profiles will become more typical and therefore these weather files should be used in the building simulation models overheating analysis so that a means of mitigating the overheating risk can be considered.

The results from the analysis show that applying cooling to bedrooms and living rooms is the most effective method in overcoming the risk of overheating, as 412 out of 412 spaces pass the criteria specified in CIBSE TM59 using DSY01 and 02. For the iteration where openable windows were utilised in the dwellings, this resulted in the majority of rooms passing and those rooms that failed were marginal failures. Further solar shading and reducing the percentage of glazing may provide sufficient enough improvement to ensure the overheating criteria is met.

Acoustic constraints have also been considered as part of the accompanying overheating assessment."

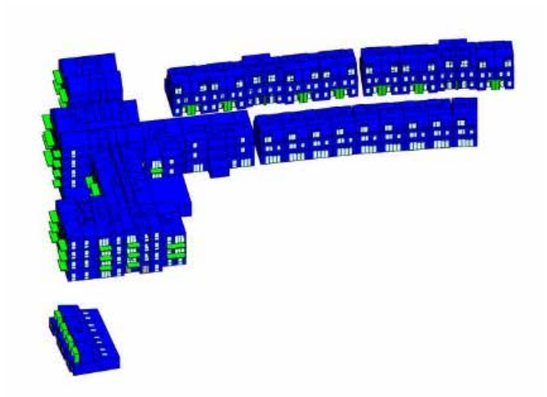
6.5 Flood risk & drainage

The following summary is provided by Waterman Infrastructure & Environment Ltd. For a full understanding of the flood risk and drainage please refer to the separate 'Flood Risk Assessment' submitted alongside this application.

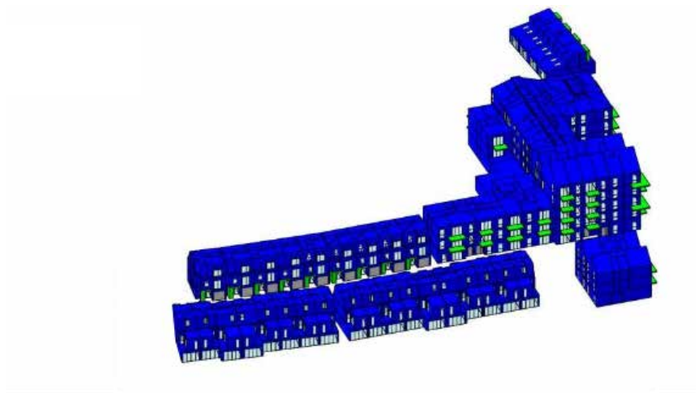
Environment Agency (EA) mapping indicates that the site is predominantly located within Flood Zone 1, denoting a low probability of flooding from fluvial flooding, with a small area along the northern boundary directly adjacent to the River Crane, located within Flood Zone 2, denoting a medium probability of fluvial flooding. The EA have provided modelled fluvial flood levels for the site which when compared to the detailed topographic survey, confirm that the bank levels along the River Crane would not be overtopped during the 1 in 1000 year flood event. The risk of flooding from pluvial, groundwater and artificial sources has also been assessed and found to be low.

To preserve access to the River Crane for maintenance, a minimum offset of 8m would be provided from the river to any proposed buildings, providing a significant betterment over the existing situation. All street furniture that falls within this offset would be removable to allow access as and when required.

Surface water runoff would discharge through a combination of infiltration and pumped outfall to the River Crane. Discharge to the River Crane would be restricted to the 1 in 100 year greenfield rate. A minimum attenuation volume of 645m3 would be provided to restrict discharge to this rate, including an allowance for the future impacts of climate change. This would be provided in the sub-base layer of the proposed permeable paving. Foul flows from the site would discharge by gravity to the Thames Water sewer network.



View looking east



View looking wast

6.6 Structures

The following summary is provided by Waterman Infrastructure & Environment Ltd. For a full understanding of the structure please refer to the separate structural drawings submitted alongside this application.

"For the Building F structure Waterman have undertaken an assessment of all the available structural options for the superstructure frame considering the criteria including: flexibility, economics, contractor preference, programme, services integration, and buildability.

Excluding the uppermost floor, an RC flat slab solution was the most cost effective and the most appropriate solution for this project, offering a number of advantages to the scheme, including:

- Free horizontal distribution of services across the exposed soffits
- Inherent thermal mass and fire protection together with good acoustic properties
- Locally sourced recycled aggregates can be specified

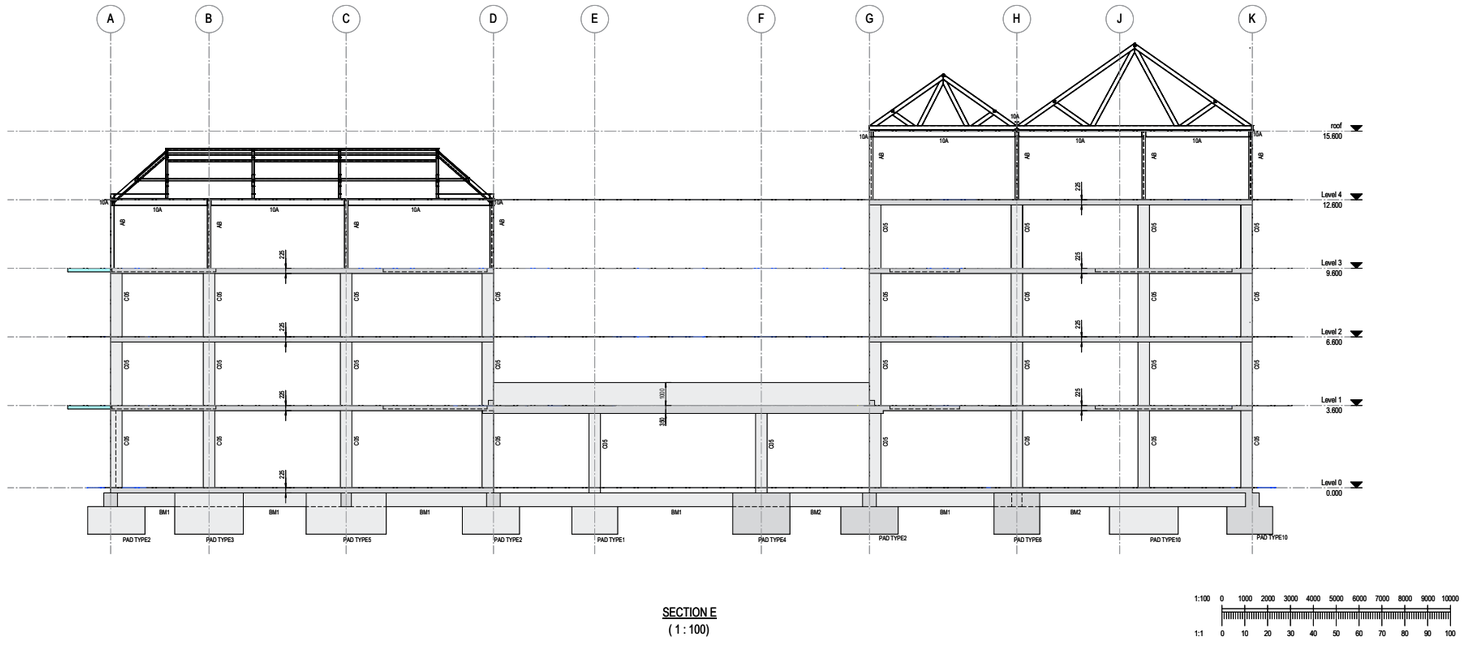
The pitched roofs lend themselves to lightweight pre-fabricated steel trusses supported off steel posts to frame out the upper floor without extending up the RC superstructure.

For the foundations, the Geotechnical Investigation has confirmed the presence of gravel at a depth of approximately 1.0m b.g.l. Initial structural loading calculations suggest that shallow reinforced concrete pad foundations can be designed to bear on to the gravel and spread the loads from the columns and core walls.

For the terraced housing the intent is to utilise simple and repetitive structural solutions. The foundations are mass concrete strip foundations, the walls are load bearing masonry, the ground floors are beam and buildings and the upper floors and roof are timber. Limited steel beams are required to trim stair openings and form the mansard roof profiles.

For the industrial building a portal frame structure is proposed with brick base and metal cladding."

Proposed 3D structural frame



Emerging structural design

6.7 Sustainability strategy

The following summary is provided by Sol Environment and Desco. For a full understanding of the proposed overheating mitigation strategy please refer to the separate 'BREAM Assessment' and 'Sustainability Checklist' submitted alongside this application.

"The proposals for the industrial units seek to achieve high standards of sustainable design by achieving a BREEAM Excellent rating with a targeted score of 74.38%. The development endeavours to promote environmental sustainability through land use, improved biodiversity, sustainable building practices, utilising clean and renewable sources of energy, designing buildings which are energy and water efficient, ensuring good resource and waste management, material selection, responsible sourcing of materials and reducing the risk of pollution and flooding as a result of the development.

The sustainability of the development will be achieved through:

- Building design – fresh air, daylight, non-polluting materials good fabric performance;
- Resource efficiency – less energy use, low carbon, water and waste minimisation; and
- Healthier, safer community – green travel, communal spaces, access to local amenities, security of site and buildings.

Building Design

An initial Passive Design Analysis and Low Zero Carbon Feasibility Study (LZC) has been carried out as part of the planning process. This identifies the opportunities for incorporating passive design measures such as high-performance building fabric with enhanced u-values to all elements, air tightness and low thermal bridging, maximised daylighting and passive solar gain in order to reduce the total heating and cooling demand of the building. Renewable energies will be specified in accordance with the recommendations of the LZC Study to ensure clean, green energy is provided to the building where feasible. The LZC currently recommends the use of high efficiency photovoltaic panels delivering the building's electricity together with air source heat pumps to provide heating, cooling and hot water generation (part of tenant fit out).

The project will endeavour to use materials with a low environmental impact (including embodied carbon) over the full life cycle of the building by careful selection of materials and constructions. A life cycle analysis of the building has been completed with option appraisals to enable the design team to understand the environmental impact of each decision or material selection. A more detailed life cycle analysis will be completed at Technical Design to review further construction options and their impact on the embodied carbon over the life cycle of the building.

Materials will be specified which are robust and durable to cater for their level of use and exposure. Externally the building will predominantly be faced with metal cladding and brick which provides a robust and easily maintainable finish. Materials will be sourced in accordance with the project sustainable procurement plan. All timber products used on the project will be legally harvested and traded with Chain of Custody certification (e.g. FSC, PEFC). All non-timber products will be sought to be from suppliers/manufacturers with Environmental Management System (EMS) certification (e.g. ISO 14001, BES 6001). Where appropriate, materials will be sourced that are made and/or supplied locally.

The use of materials with a high recycled content will be considered where viable such as crushed concrete to be used for hardcore.

Resource Efficiency

The building will be designed to minimise operational energy demand and reduce carbon dioxide emissions by adopting the energy hierarchy of the Be Lean - Be Clean - Be Green approach as set out within the London Plan to achieve a minimum overall 35% reduction in carbon emissions over the Building Regulations Part L 2013 and meet the BREEAM 'Excellent' minimum requirements for Issue Ene01.

The consumption of potable water for sanitary use in buildings from all sources will be reduced by at least 50% over a baseline building through the use of water efficient components, including the specification of low flush toilets and low flow rates for taps/showers.

External landscaping and planting will be designed such that it relies solely on precipitation, during all seasons of the year.

Water consumption will be monitored and managed in order to encourage reductions in use. In order to reduce the risk of undetected leaks, a leak detection system will be installed on the mains water supply within the buildings and between the buildings and the utilities meter. Flow control devices will be fitted to the water supply to each sanitary area to minimise water loss from leaking taps or appliances.

The proposal will aim to minimise the materials needed in construction and the amount of demolition, excavation and construction waste to landfill through the promotion of resource efficiency via effective management and the reduction of waste. A pre-demolition audit will be prepared covering the existing buildings, structures or hard surfaces to be removed to determine if refurbishment, reuse or recycling is feasible.

The 'Waste Hierarchy', as shown below, will be adopted to maximise the use of existing materials and resources and minimise waste generated, which will be limited to 3.4m3 or 3.2tonnes per 100m2 of gross internal floor area:

- Reduce – first priority is to reduce the amount of waste produced through design, construction methods and minimising over ordering
- Re-use – any materials to be reused where feasible either on site (preferable) or off-site
- Recycle – where materials cannot be recycled on site, a suitable waste management contractor will be employed to ensure any waste which is able to be recycled, is recycled off-site. Suppliers with 'take-back' schemes will be selected where available
- Resource Recovery – for energy generation processes – fuel, heat and power
- Disposal – will be limited to any hazardous waste or materials which cannot be recycled

Waste minimisation will also be promoted during the use of the development through the provision of suitable recyclable and general waste storage areas. A minimum of 2m2 per 1000m2 of NIFA will be provided for the storage of recyclable waste to the industrial unit.

Health and Wellbeing

The industrial units will be designed with the health and wellbeing of its occupants in mind. The proposed design includes generous amounts of glazing and floor to ceiling heights to ensure areas are provided with a uniform and good standard of natural light, as well as an adequate view out. This will reduce the reliance on artificial lighting.

Industrial occupiers also have access to the landscaped outdoor amenity along the river, along with the heavily planted shrub bordered areas around the building itself, promoting a healthier life style and sustainable modes of travel. Included within the 1,000 sq m of high-quality industrial floorspace provided, 117 sq m (12%) is affordable industrial floorspace proposed as affordable at 80% market rate.

The development will endeavour to provide a safe and secure place to live and work. The local Designing Out Crime Officers have been consulted and their recommendations will be incorporated into the design.