

5.4 Play strategy

Play provisions has been designed to meet standards set by the Richmond Supplementary Planning Documents. These are beyond the requirements of the GLA.

410sqm of children's play is accommodated on the ground floor play garden and semi private roof terraces. These spaces are overlooked by the residential frontages creating passively surveyed space and promoting an active environment. Play opportunities are provided for 0–5-year olds, while 5–12+ play is accommodated in the surrounding area as detailed on the following page. Homes along the mews street benefit from their own private rear garden which will provide additional safe and secure amenity space for individual families. These have been designed to accommodate both hard and soft surfaces to allow for different types of play.

The table below indicates the quantum of required play by the Richmond SPD.

| Age | Population Distribution* |
|-------|--------------------------|
| 0-3 | 28.3 |
| 4-10 | 29.3 |
| 11-15 | 14.3 |
| 16-17 | 6.0 |

| Age Breakdown | Child Yield | Child Play Space (m2) |
|---------------|--------------|-----------------------|
| 0-4 | 41.02 | 410 m2 |
| 5-11 | 45.74 | 457m2 |
| 12+ | 21.36 | 214m2 |
| Total | 108.1 | 1,081m2 |

*Note that the Richmond Planning Obligations SPD child yield breakdown comprises different age brackets from those detailed within the table above, and the breakdown within the table has therefore been adjusted accordingly

Natural play features such as logs, stumps, mounds, boulders and stepping stones will be dotted throughout the play garden. These hard-wearing play elements will be fixed within lawn areas or rooted within replenishable surfaces, such as chipped bark, reflecting typical design for natural play areas. Resilient sensory planting will also be provided with local plant species recommended by Environmental Consultants, Richard Grave Associates Ltd.

- Key:
- 160sqm total ground floor public realm
 - 250sqm total semi private communal roof terrace



Section A-A showing play areas and riverfront timber platform



Example of a raised timber platform



Example of grass playable mounds

5.5 Local play

This site benefits from numerous green amenity spaces within a short walking distance. Based on the analysis of the surrounding play areas, it is considered that there is sufficient play space for 5+ year olds in the surrounding area. It is therefore proposed that play space for 5-12+ year olds will be accommodated within the Parks and Greens listed below.

A – Crane Park

The park is designed to encourage wildlife, and the banks of the River Crane are home to a thriving colony of marsh frogs and the rare Water Vole. Crane Park Island is designated a Local Nature Reserve.

B – Kneller Gardens

A pleasant park that is part of the River Crane Walk and connects with Crane Park to the south-west and Mereway Nature Park to the east.

Facilities include:

- Cafe, changing room
- Two mini football pitches
- One full-sized football pitch
- Four tennis courts
- Table tennis
- Basketball court
- Play equipment for under 13s as well as older children
- Outdoor gym equipment

C – Mereway Nature Park

Neighbouring Kneller Gardens, this conservation site provides varied grasses and bramble for a diverse range of species. Seating is available for those who want to stop and rest.

D – Craneford Way Recreational Park

A large area of grassland with a popular play area for younger children, Craneford Way forms part of the River Crane Walk.

E – Twickenham Green

The green is a great place for informal ball games, with cricket matches often hosted during summer. There are changing facilities available, as well as a cafe.

F – Radnor Gardens

It is believed that the first Weeping Willows were planted at Radnor Gardens, which also houses several rare and beautiful trees including an Indian Bean (*Catalpa Speciosa*).

Facilities include:

- A cafe
- Bowls club
- Play area
- Fishing is permitted with the appropriate licence.



Map indicating surrounding play areas



5.6 Planting strategy

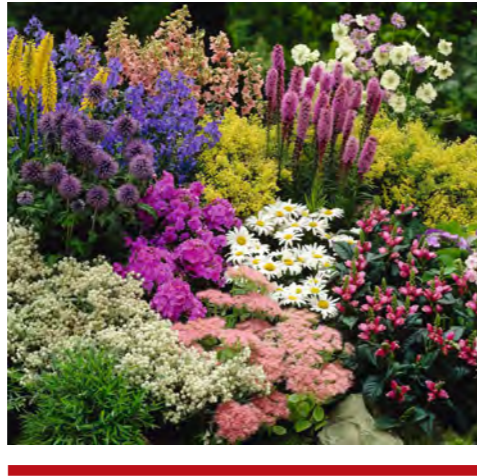
Within the development, planting will be used to create a visually interesting scheme throughout the year. Currently there is minimal planting within the site and therefore the aim is to flourish the scheme with an array of ornamental and native planting.

The fragrant and textured planting palette is designed with biodiversity in mind. The species chosen will benefit bats by providing either a food source of insects or roost potential. Lawns will be planted with an annual bulb or wildflower mix to provide seasonal interest.



Native hedge

- Ligustrum vulgare
- Crataegus monogyna
- Fagus sylvatica
- Ilex aquifolium



Ornamental

- Skimmia Japonica
- Lonicera Nitida 'Maigreen'
- Escallonia 'Apple Blossom'
- Hypericum sp
- Lavandula sp
- Narcissus sp
- Galantus nivalis
- Dryopteris filix mas
- Hedera sp
- Rosmarinus Officinalis
- Lavandula Augustifolia
- Fatsia japonica
- Photinia fraseri 'red robin'
- Hypericum androsaemum



Lawn and bulbs

- Cynoglossum officinale
- Silene dioica
- Lychnis flos-cuculi
- Stachys sylvatica
- Galium verum
- Leontodon hispidus
- Leucanthemum vulgare
- Lotus corniculatus
- Primula veris
- Prunella vulgaris
- Ranunculus acris
- Rumex acetosa
- Trifolium pratense
- Agrostis capillaris
- Cynosurus cristatus
- Festuca rubra
- Phleum bertolonii



Roof terrace

- Allium schoenoprasum
- Anemone x hybrida
- Kniphofia 'Royal Standard'
- Lamprocapnos spectabilis
- Liriope muscari
- Rudbeckia fulgida
- Senecio cineraria
- Verbena bonariensis




Plan indicating planting strategy

5.7 Tree strategy

Trees have been carefully placed and will become a central feature throughout the scheme. The mews street becomes a tree-lined street, creating a green corridor that links to the existing River Crane green/blue corridor. The trees are a mixture of native and non-native species which have been developed with the Ecology Consultant, Richard Grave Associates. There are also a number of feature trees, including conifers, which will provide year-round colour.




 Pinus sylvestris



 Salix babylonica



 Acer campestre




Plan indicating tree strategy



 Pyrus calleryana 'Chanticleer'



 Sorbus aucuparia



 Betula pendula

5.8 Biodiversity

In conjunction with Richard Graves Associates we have designed a plant palette which benefits the local wildlife by providing either a food source for insects or roost potential. Bird and bat boxes are proposed to be attached to larger mature trees.



Example of bat boxes



Example of bird boxes

5.9 Green roof

The green roof is located adjacent to the First Floor terrace and provides storm water management, a habitat for wildlife and contributes to lowering urban air temperature preventing the heat island effect.



Green roof diagram

5.10 SuDs strategy

Permeable paving and surfaces can be seen in the SuDs strategy diagram. We propose 0.22ha of permeable surface across the ground floor.



SuD's strategy diagram



Example of invertebrate hotel



Extract of green roof from masterplan






Example of biodiverse plant palette

5.11 Lighting strategy

Lighting will be embedded within the landscape throughout the scheme. The proposed lighting highlights the timber platform and green corridor enhancing them making them more welcoming and safer in the evening. More discrete lighting will be used along the Mews Street to prevent nuisance to residents with front facing windows.

The lighting strategy along the River Crane will aim to minimise the light trespass onto the River Crane. As excessive lighting can damage bat foraging the minimal use low-level light bollards and lighting are directed away from the river.

Key

-  Column lighting
-  Bollard lighting
-  Low lighting / tree uplighters



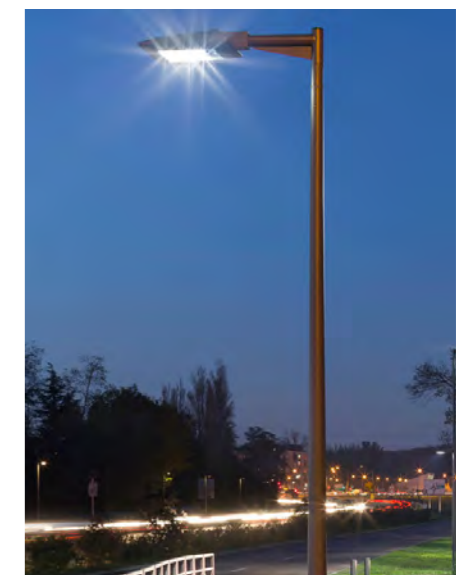
Plan indicating lighting locations



Illustrative diagram indicating lighting strategy



Example of tree uplighters



Example of light columns



Example of bollard lighting



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EVERMOTION



Introduction

Context

Design process

Design response

Landscape

6.0 Technical design

Access

Appendices

6.1 Transport and parking

The scheme provides 117 total car parking spaces, working out as 1 space per dwelling, 1 space for the B1 office and 1 space for a car club.

This is distributed as follows:

- 29 private spaces on drive (of which 6 are accessible)
- 16 integrated garage spaces
- 20 allocated spaces below podium (of which 2 are accessible)
- 50 allocated surface spaces (of which 4 are accessible)
- 1 commercial space
- 1 car club space on Edwin Road

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.

In compliance with the Draft London Plan 2017 the scheme provides a total of 228 cycle spaces. These are broken down as follows:

- 48 spaces at 1.5 spaces per dwelling for all 1 beds
- 168 spaces at 2 per dwelling for all 2 bed+
- 4 spaces at 1 per 40 dwellings for short stay visitors within the landscape.
- 8 spaces for the commercial building
- 228 cycle spaces

Houses have secure cycle storage within garages or in external stores.

Apartments have dedicated cycle stores within each building in the form of two tier cycle racks.

The B1 office is provided with a secure external store, whilst a number of sheffield stands are provided within the public realm for visitors.

The proposals detail several improvements to the transport offering of the existing site. The residential development will provide an internal road, linking the existing site access along Gould Road and Edwin Road, to the north and south respectively and facilitating both pedestrian and vehicle flow through the site. Given the low traffic volumes, low speeds and residential nature of the site, a less formal shared-surface street scene is proposed as opposed to a full suite of formal road markings and signage. The removal of the existing site access gates and internal shared surface facilitates pedestrian accessibility through the site, and enhances connectivity to the River Crane to the north.

Both the office and residential elements of the site provide a level of car and cycle parking which is compliant with local and regional parking standards, 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.

The proposal to provide 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 provide a communal benefit for surrounding residential properties. The implementation of the car club 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 and servicing strategy

The new internal road will enable all refuse collection, residential deliveries and maintenance vehicles access to set-down and collect from within the site. The two-way access road ensures that all 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 main terrace. For the apartments and the houses adjacent to the river, shared refuse and recycling stores are provided.

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 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

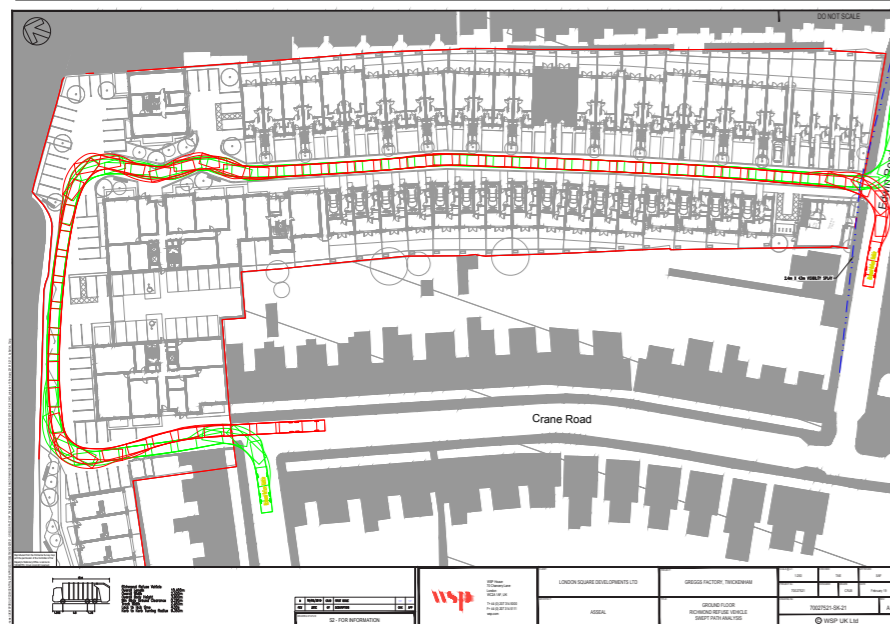
Houses and developments of up to two units:

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.

Flats of three or more units:

| 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 and public health

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 the requirements of Greater London Authorities, 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 blocks 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 block corridors as defined in fire report. Dry risers will be installed in each core of each apartment block. 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 blocks 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 blocks 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 block. External lighting shall be installed throughout the site as set out in the external lighting report. Lightning Protection shall be installed to all required buildings in the development, to be confirmed by the developer's insurer. All buildings shall be served with gravity fed above ground foul drainage and rainwater drainage.

The commercial office facing onto Edwin Road will be built as a shell and core build, with capped off incoming services and below ground drainage connections. It is envisaged that the commercial office when fitted out will be served by a VRF simultaneous heating and cooling system, with mechanical ventilation with heat recovery to provide the fresh air requirements to the building. Hot water for wash

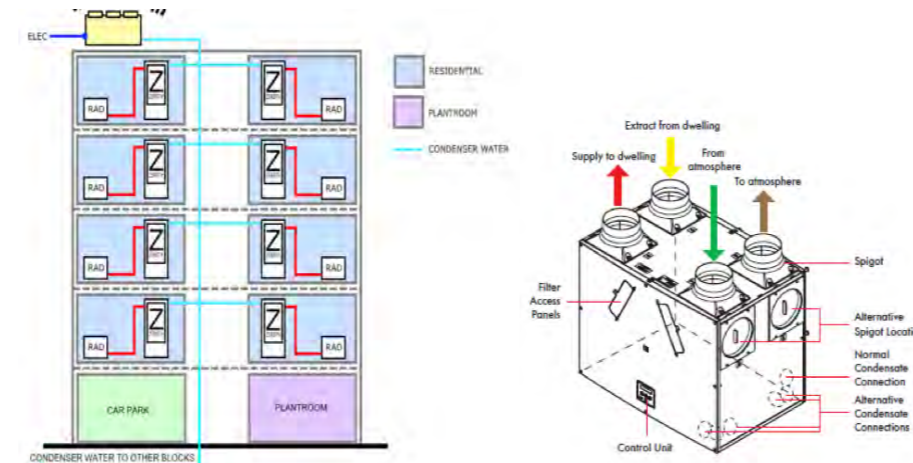
hand basins will be generated through electric point of use water heaters and electric showers where required. LED lighting will be installed throughout the building, with adequate provision for small power and data throughout.

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 commercial office building identified on the site plan below. The provision of photovoltaic cells shown is to ensure the site wide carbon emissions improvement is maximised and the carbon offset payment is limited, whilst ensuring the GLA target is met.



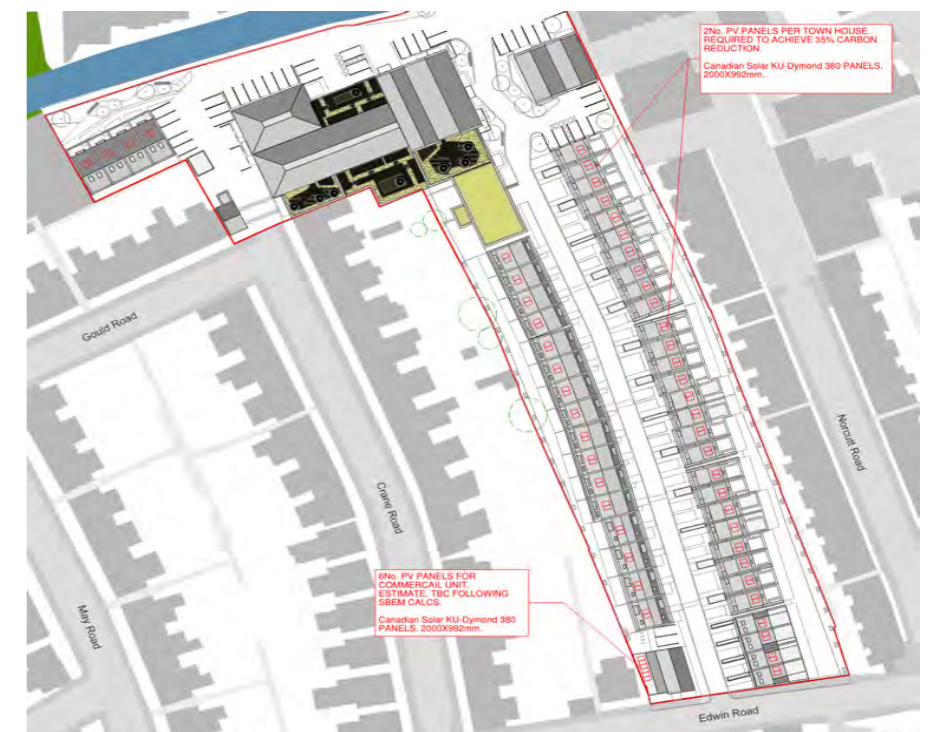
Apartment block system illustration

Apartment block system illustration



Apartment block system illustration

MVHR unit



Photovoltaic panel locations

6.4 Overheating mitigation

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 & 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 491 out of 491 spaces pass the criteria specified in CIBSE TM59 using DSY01 & 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.

Although, due to high external noise levels on the site the advice received to date from the acoustic consultant is that the windows cannot be opened for the purposes of preventing overheating, as internal noise levels will exceed the maximum allowable limits.

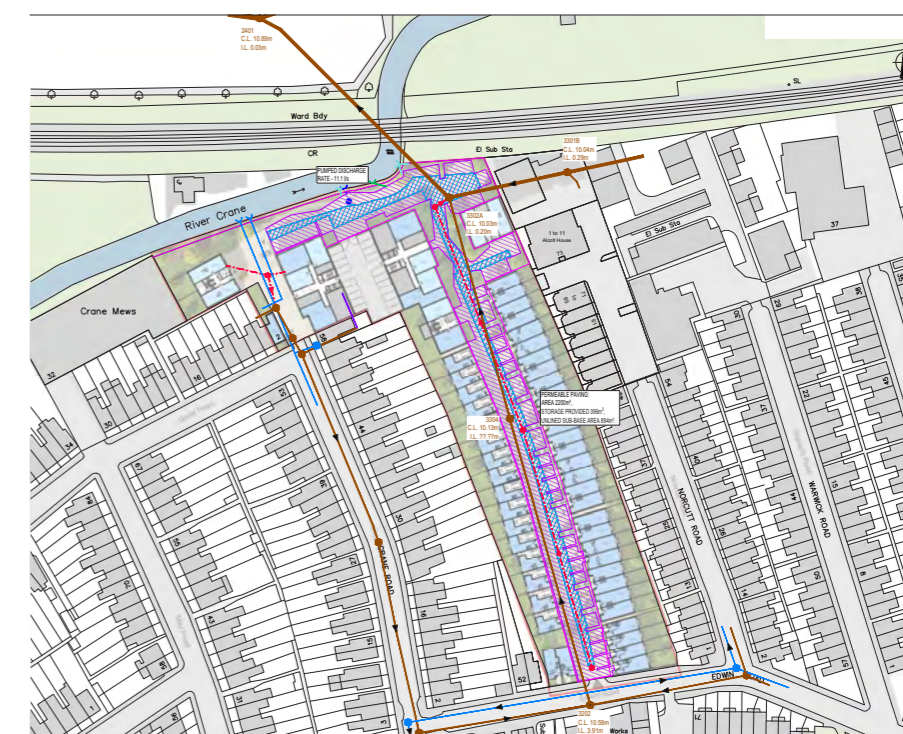
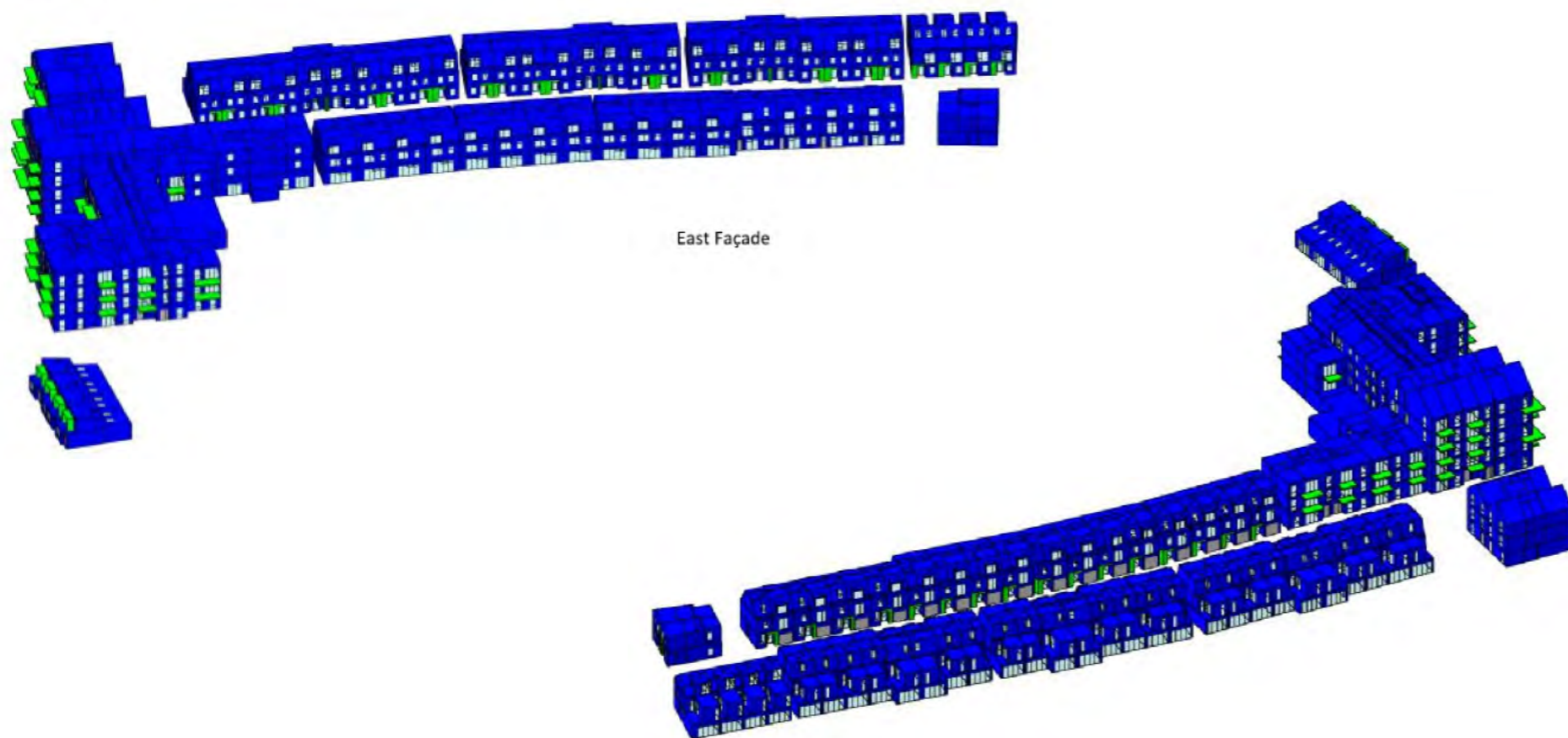
6.5 Flood risk & drainage

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 with 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 7.8m would be provided from the top of bank to any proposed buildings. Offsets to the River would be in excess of 7.8m for the majority of the length of the River Crane throughout the site, providing a significant betterment over the existing situation. All street furniture that falls within this offset would be removeable to allow access as and when required.

Surface water runoff would discharge through a combination of infiltration and a pumped outfall to the River Crane. Discharge to the River Crane would be restricted to the 1 in 100 year greenfield rate. 396m³ of attenuation 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.

West Façade



Permeable surface areas

6.6 Structures

The following text has been provided by The Waterman Group, who are appointed as the structural consultant.

For the Block 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

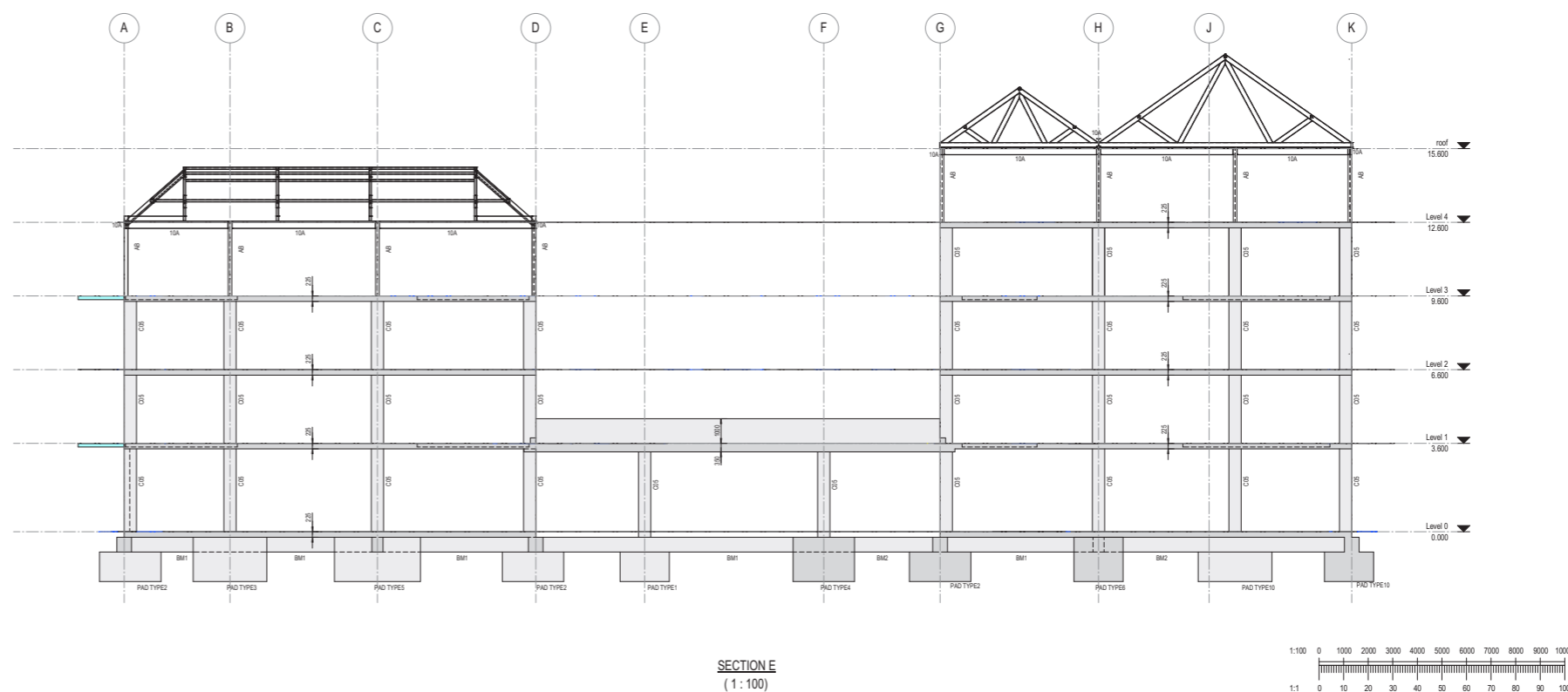
The pitched roofs lend themselves to lightweight pre-fabricated steel trusses supported off steel posts to frame out the upper floor without extending up the RC superstructure.

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 a 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 load bearing masonry, the ground floors beam and block, and the upper floors and roof timber. Limited steels beams are required to trim stair openings and form the mansard roof profiles.



Proposed 3D structural frame



Emerging structural design