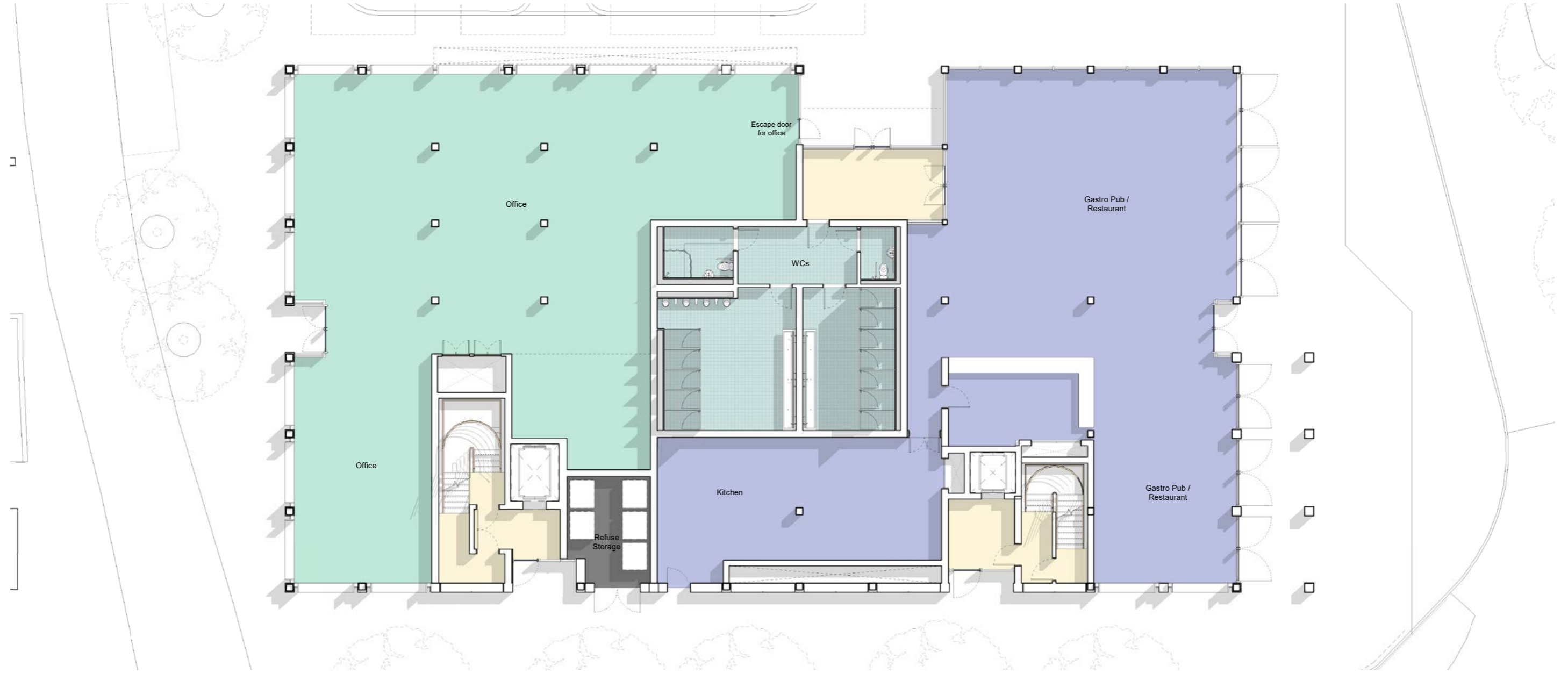
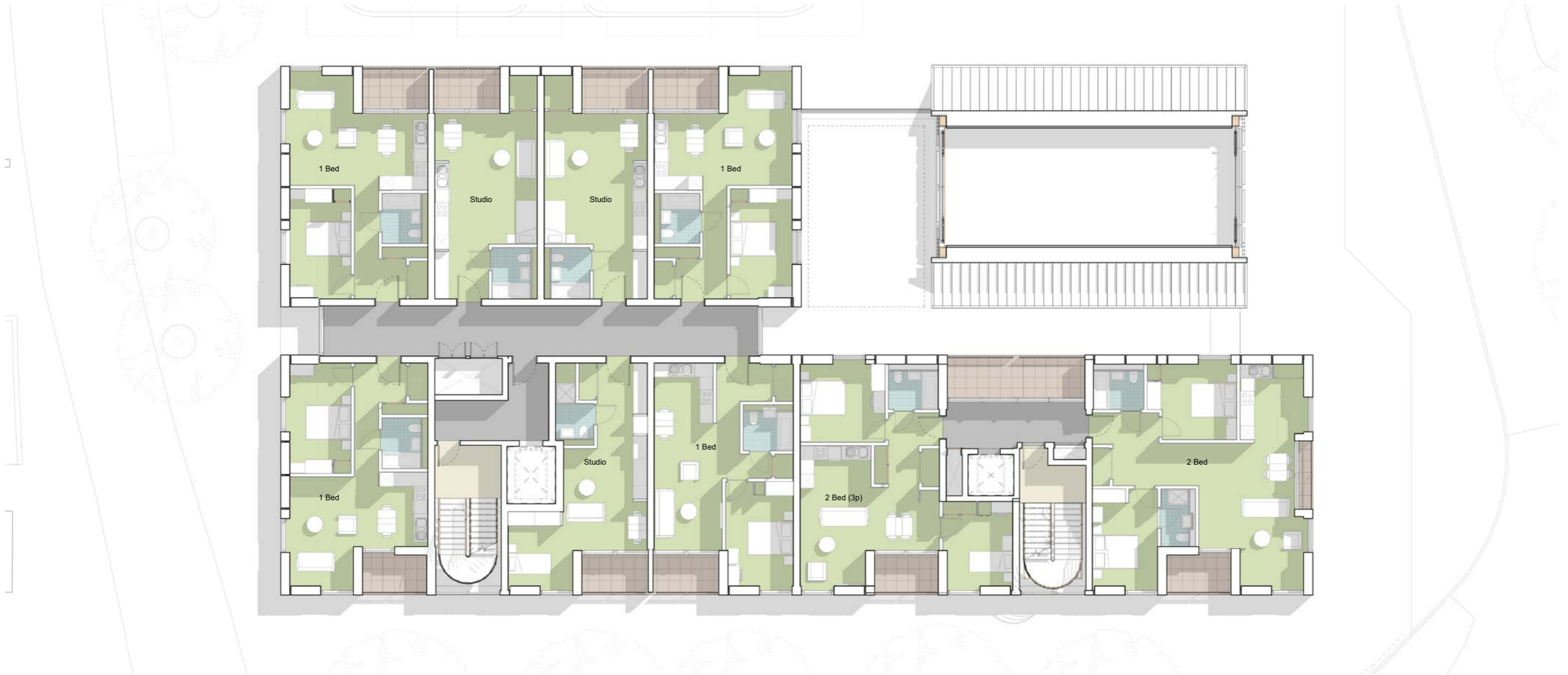


## **9 | Wharf Lane Building**

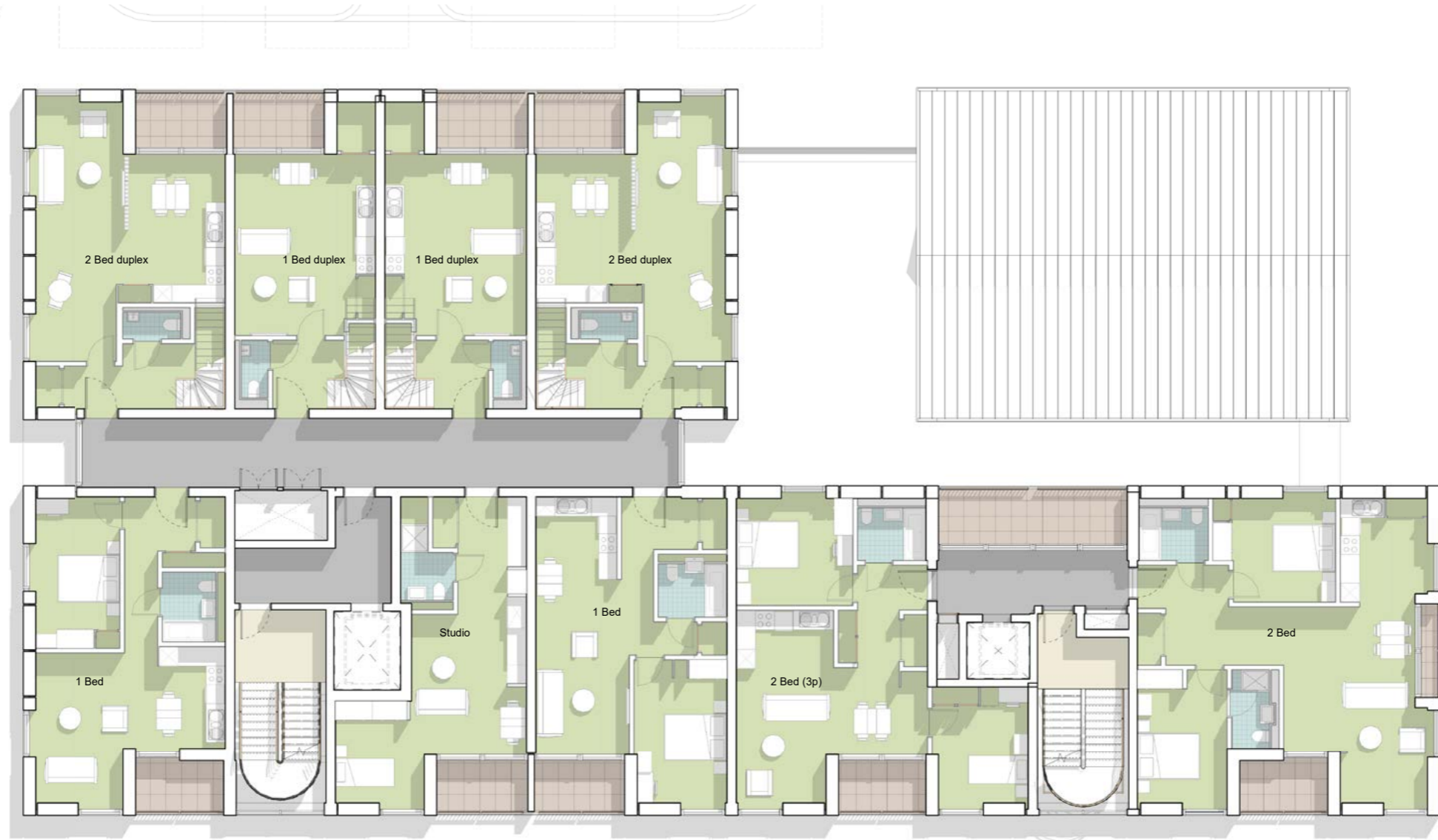
Wharf Lane Building  
Ground Floor Plan



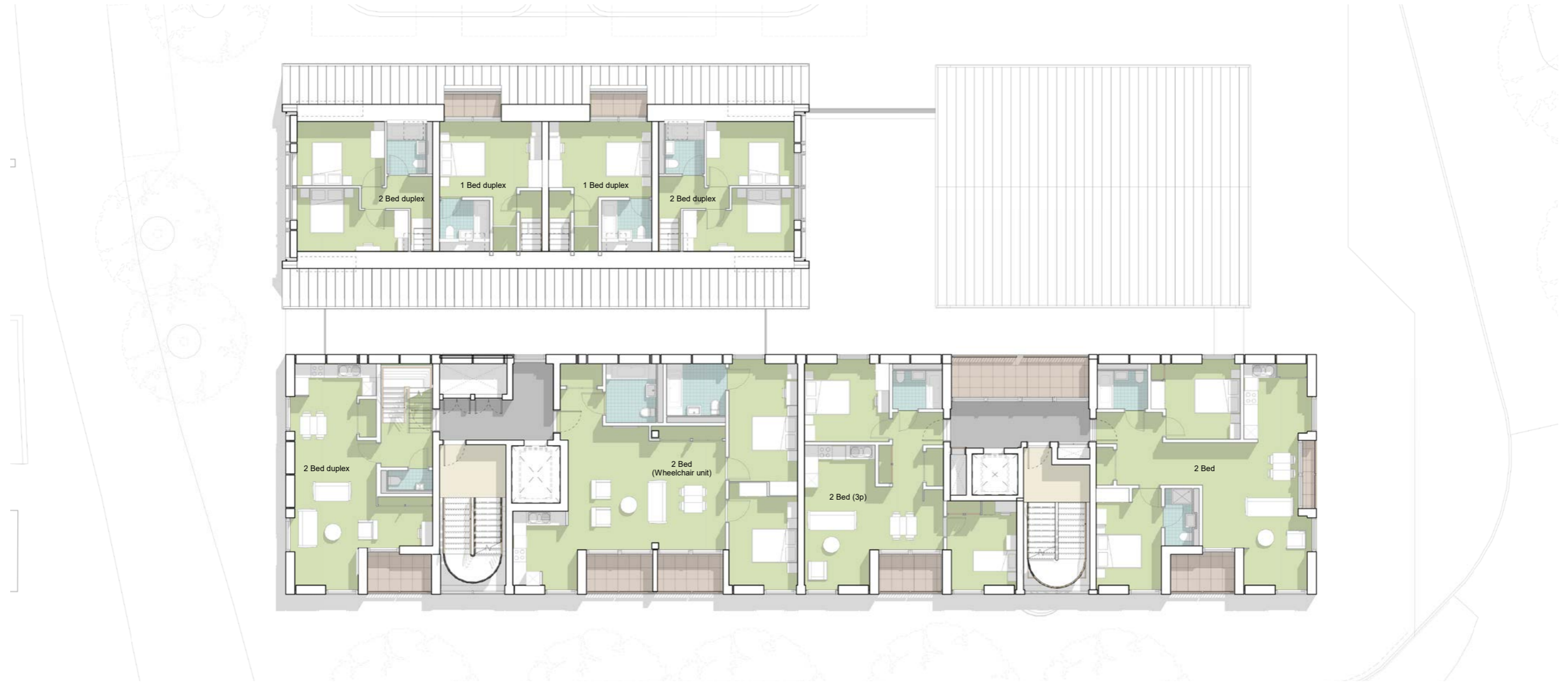
**Wharf Lane Building**  
First Floor Plan



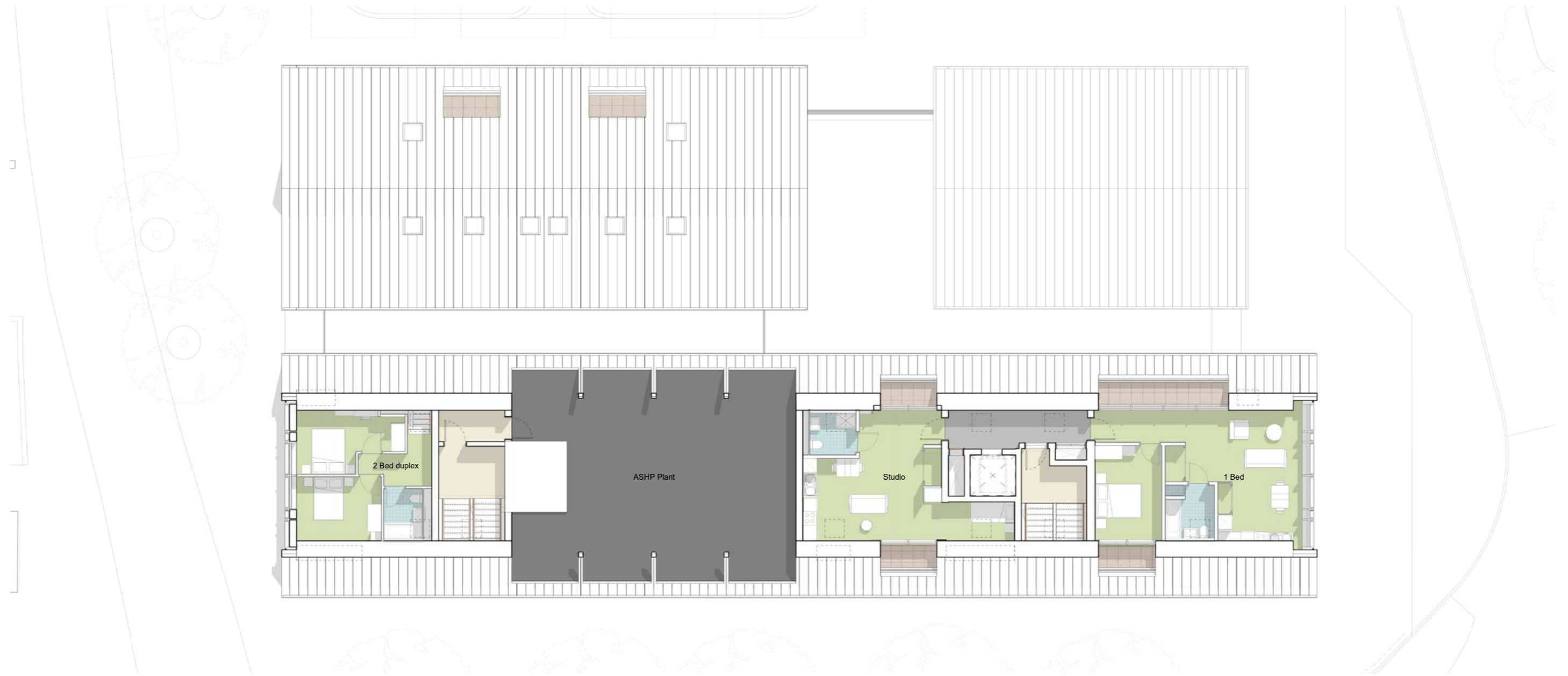
Wharf Lane Building  
Second Floor Plan



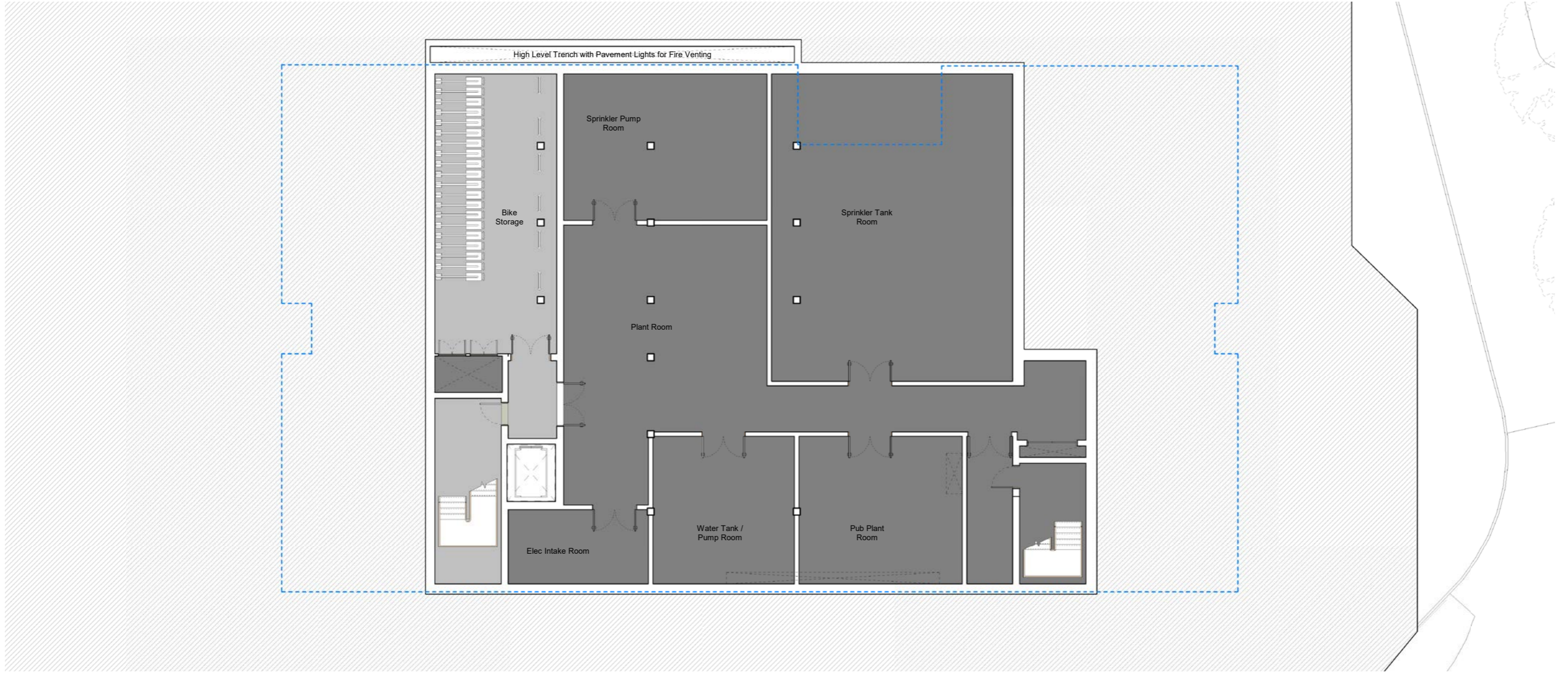
**Wharf Lane Building**  
Third Floor Plan



Wharf Lane Building  
Fourth Floor Plan



Wharf Lane Building  
Lower Ground Floor Plan



**Wharf Lane Building**  
Facade Development



*River elevation of Wharf Lane Building at the end of RIBA Stage 2*



*Garden elevation of Wharf Lane Building at the end of RIBA Stage 2*



*River context - steel framed boatyards on Eel Pie Island*

The Wharf Lane Building is very much part of the river scene and as such takes inspiration from the wharf type buildings along the stretch of the river, particularly those on Eel Pie Island. This is evident in the simple form of the buildings, the long linear roofs and modular nature of the facades.

At the competition stage the building's facade was primarily made up of timber panelling and glass with timber brise soleil but concerns over fire spread in multi-tenanted residential buildings has led to a reassessment of this.



## Wharf Lane Building Facade Development



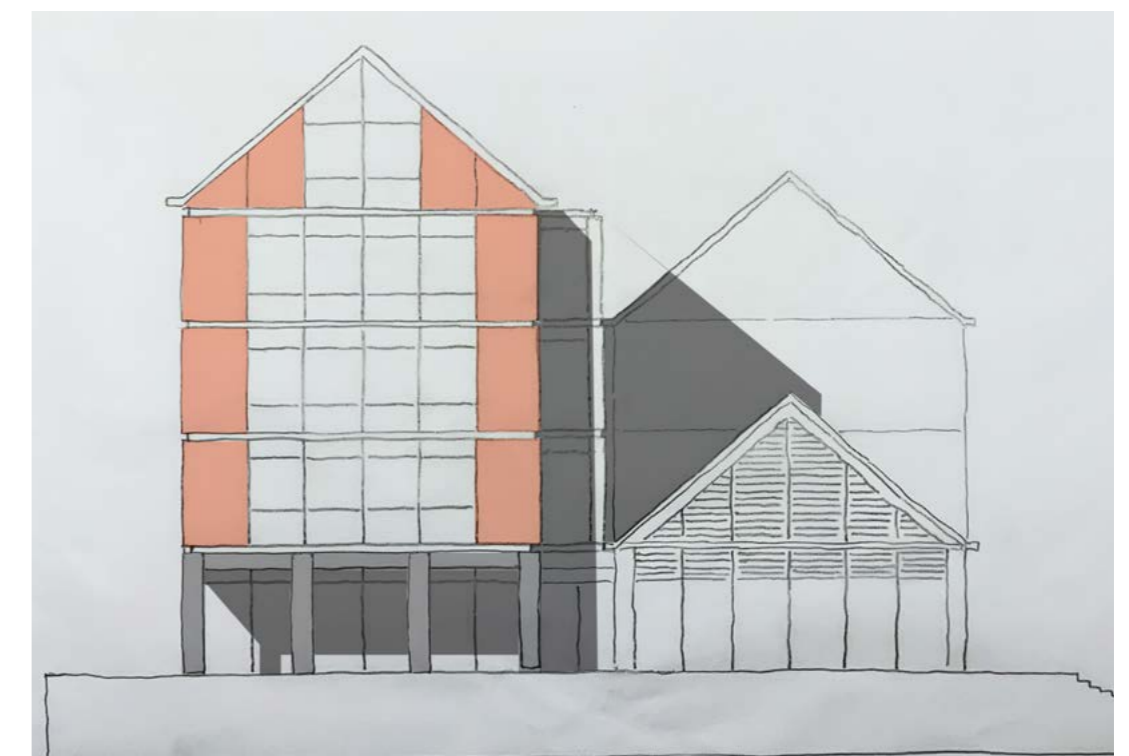
Development sketch of Wharf Lane Building's garden elevation



Development sketch of Wharf Lane Building's street elevation

In order to address the fire spread issue the facade is composed of masonry skin but we have looked to maintain the panelised and modular nature of the façade by using prefabricated brick faced panels with metal edging. The panels are not made up of brick slips but instead 102.5mm thick brickwork is proposed. These sit between metal channels which align with the floor slab locations. Ventilation grilles are included above some of the windows, as denoted on the elevations.

The commercial units on the ground floor have a slightly different façade treatment to the upper storeys. We have used a pre-cast concrete cladding to accentuate the framed nature, with a combination of infill panels determined by the internal function beyond. The office and pub/restaurant are primarily glazed with feature metal channels down the sides and ventilation grilles above. The back-of-house to the pub/restaurant is faced with solid metal panels and ventilation grilles, whilst the bases to the stair cores use pre-cast concrete cladding.



Development sketch of Wharf Lane Building's south gable end

**Wharf Lane Building**  
 Facade Development



*An early view of the Wharf Lane Building with red brick cladding and slot windows on the east facing corridor elevation*



*As the façade develops, the use of glass blocks for cladding the corridor elevation, viewed from the embankment*



*The corridor elevation with slot windows viewed from the Diamond Jubilee Gardens*



*The glass block corridor elevation viewed from the Diamond Jubilee Gardens*

At both the pre-application meeting and the Design Review Panel taking place in April, there were concerns raised over the prominent nature of the blank façade for the corridor used to access the southern-most flats in the west block. Between the two meetings, we experimented with changing the architectural treatment of the corridor elevation, with the use of glass blocks in lieu of smaller slot windows. Although this move was believed to be an improvement, providing a more interesting elevation with a better quality of light internally, the single aspect nature of these flats was criticised. It was felt that there was a missed opportunity to make best use of the unique views east down the river.

It was believed that an improved visual connection was required between the single storey pub/restaurant element and the five storey western block. Furthermore, it was felt that the courtyard to the north of the pub/restaurant would be underused due to its orientation, receiving very little direct sunlight through the course of the day.

## Wharf Lane Building Facade Development



*A view up the river of the east elevation of the Wharf Lane Building*

Changes were made to the layouts to address all three of these primary concerns made by both officers and the Design Review Panel. By accessing all the flats from single stairs we were able to omit the southern section of corridor and make the affected flats dual aspect, to make the most of the river views. To enable this, we had to make sure the corridor lengths fell beneath what is permissible by Approved Document B for fire escape purposes. We had to also split the bank of lifts up so that each stair core had a lift associated with it.

As was the case before, the lift taking users down to the bike store has to be large enough to accommodate bikes (13 person lift), but the other lift could be made smaller (8 person lift), allowing us to take it up to the attic storey. This has allowed us to reduce the number of duplex flats, something officers had previously asked us to look at doing during pre-application.

We have also moved the southern-most stair core a bay further north to provide larger 2 bed flats at the river end where they are likely to generate more value, in lieu of the 1 bed flats there previously.

The single storey element of the pub/restaurant has extended north by a bay and the courtyard infilled to provide a foyer for the pub/restaurant and toilets. This has allowed the pub/restaurant kitchen and toilets to move upstairs from the basement, where they can be used and serviced more efficiently. By extending the pub/restaurant and infilling the courtyard, it feels less disconnected from the rest of the building and the poorly day-lit space previously dedicated to the courtyard could be internalised, with a clearer function.



*The removal of the corridor has enabled dual facing flats along the southern section of the Wharf Lane Building's western block*



*The Wharf Lane Building without the corridor elevation against its western block*

## Wharf Lane Building The Ground Plane

The single storey element, with its strong form and identity, is what defines the identity of the pub/restaurant. The fact that part of the gastro pub/restaurant also occupies part of the ground floor of the 4/5 storey unit is not significant. The two parts will each have their own character and identity internally but in reality the interior décor of the pub/restaurant will be the element that binds it all together.

The entrance to the foyer needs to be seen to relate more closely to the pub/restaurant by using a similar timber lined wall panelling to that of the ceiling in the pub/restaurant. The main signage for the pub/restaurant would be expected to be mounted to the single storey foyer front.



Image of potential signage for the pub/restaurant from the garden

Additional signage could also be fixed in front of the louvres in the gable allowing it to be placed on both gables so it can be seen both from the gardens and from the embankment and reinforces the single storey element as the identity of the pub/restaurant.



Potential pub/restaurant signage affixed to gable end of single storey element

## Wharf Lane Building The Ground Plane

The first elevation seen when approaching from the north is the Wharf Lane elevation and as you go round the rear of Iceland the attention switches to the entrance to the gardens.

Adding additional inset balconies to this elevation is not possible due to the arrangement of the flats inside and the limited depth of the accommodation, but the ventilation recesses above the office windows adds depth and articulation to the facade at the lower levels. The residential facade above is simple and restrained but provides natural surveillance of the street without compromising the privacy of the occupants.



*Ventilation recesses above the office windows*

The Wharf Lane frontage is the quietest and least public of the four elevations and is separated from the road by the need for the flood defence wall to be returned up the side of the building and the need for the floor level to be above the flood level. As the delivery bay is located in Wharf Lane it is logical for the refuse store and kitchen delivery access to be provided in Wharf Lane leaving the other three elevations free to be 100% active.

Locating the kitchen down in the basement would create access issues both in terms of deliveries and in terms of serving food. Notwithstanding this we have tried to make the Wharf Lane frontage as active as possible. The two bays at the King Street end are occupied by the office accommodation and are fully glazed as are the two bays at the river end that form part of the pub/restaurant. In between there are the two residential entrance lobbies that will also help to animate the Wharf Lane frontage.



*View from top of Wharf Lane*



*View looking along upper walkway from south west corner*

**Wharf Lane Building**  
Riverside Views



*View of the Wharf Lane Building looking downstream from Radnor Gardens*

**Wharf Lane Building**  
Riverside Views



*View of the Wharf Lane Building looking upstream from near York House Gardens, reflecting the riverside architecture of Eel Pie Island*

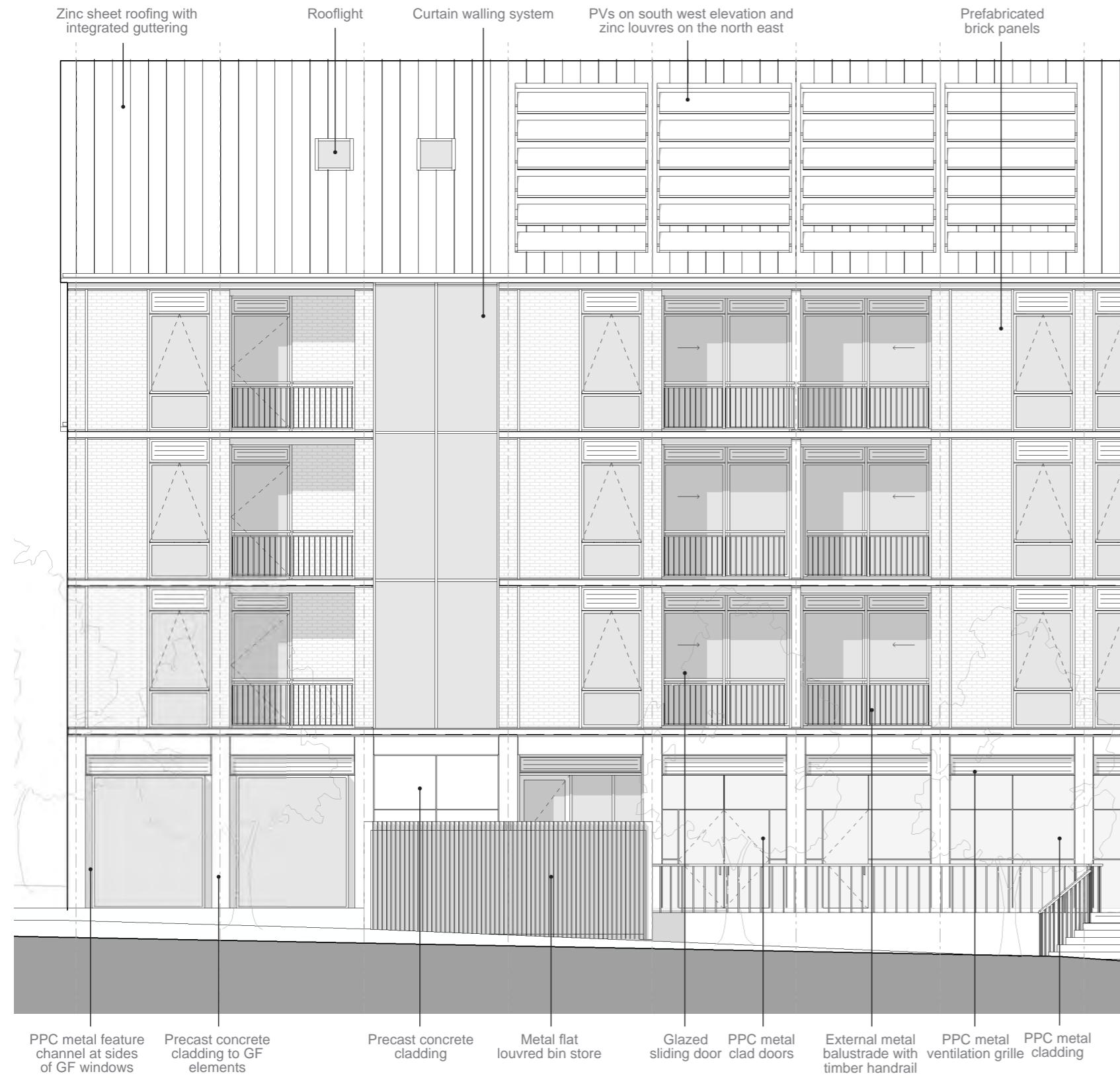
Wharf Lane Building  
West Elevation



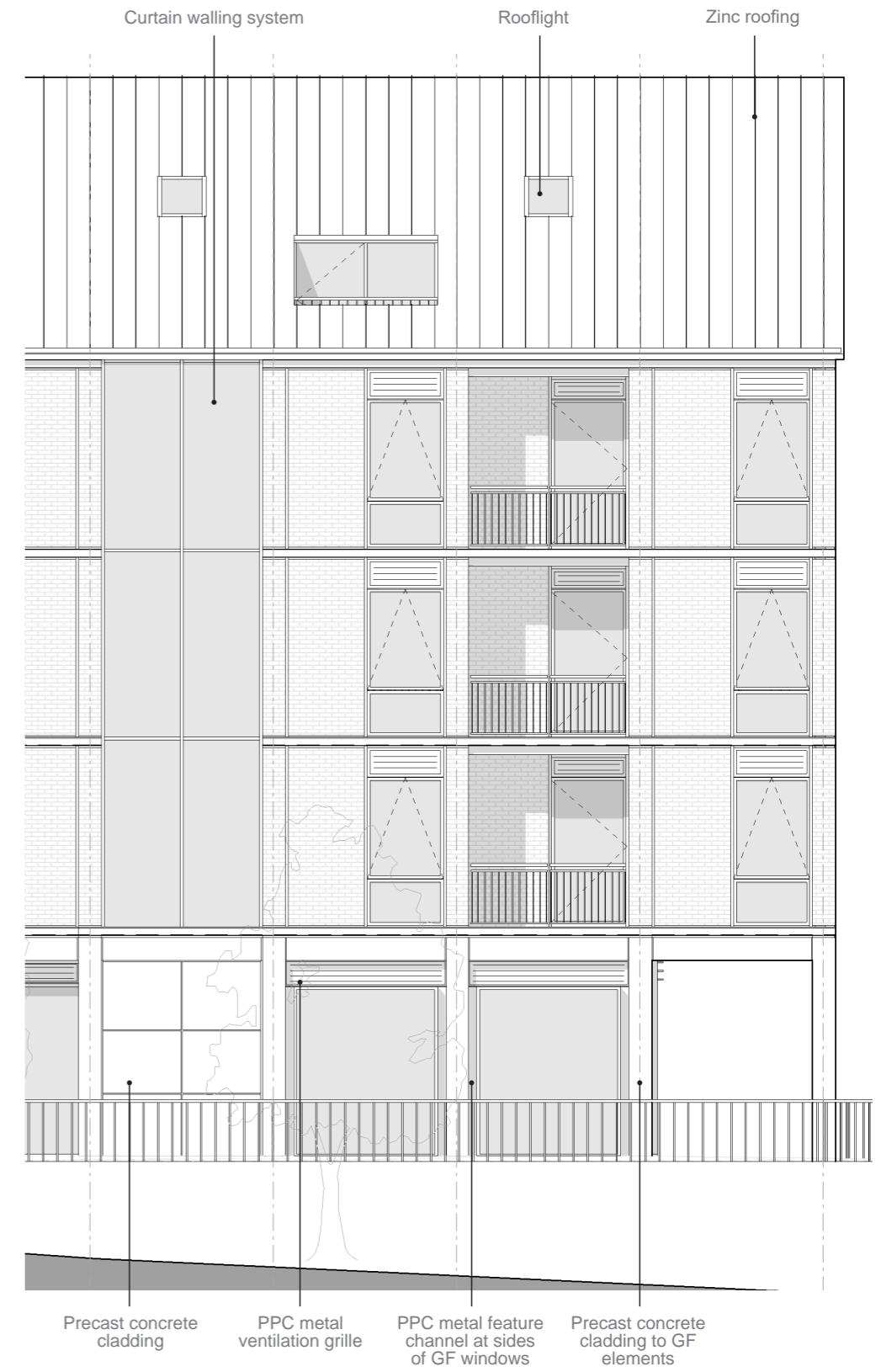
West Elevation Overall



**Wharf Lane Building**  
West Elevation Typical Bay



Wharf Lane West Elevation - North End Typical Bay



Wharf Lane West Elevation - South End Typical Bay

Wharf Lane Building  
East Elevation



East Elevation Overall

**Wharf Lane Building**  
East Elevation Typical Bay

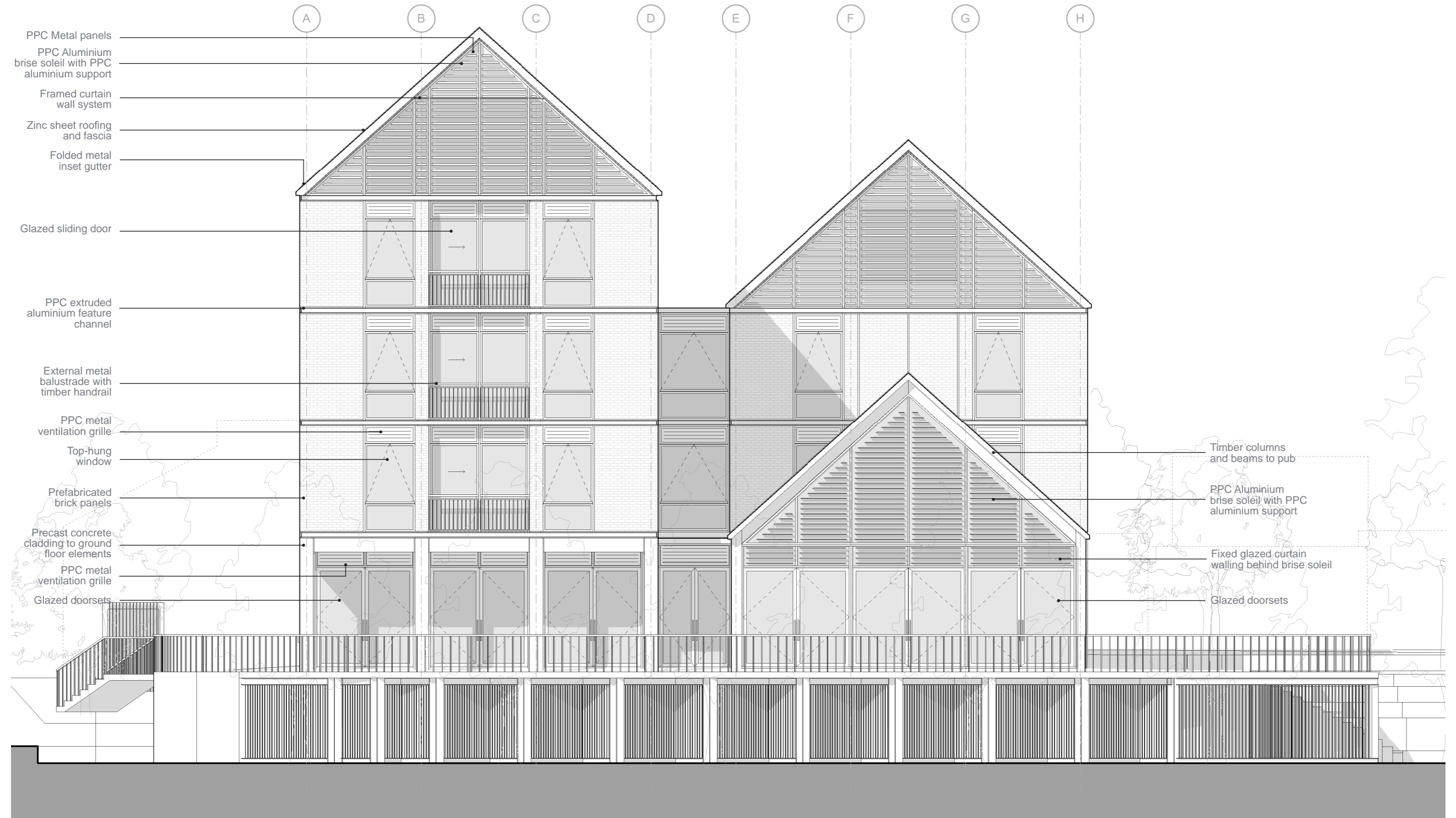


East Elevation - Pub



East Elevation - East Block

# Wharf Lane Building South Elevation



Wharf Lane Building  
North Elevation



**Wharf Lane Building**  
Site sections



*Site section of embankment showing the Wharf Lane Building's relationship to the Water Lane Building*



*Site section through Diamond Jubilee Gardens with east elevation of Wharf Lane Building*

**Wharf Lane Building**  
View from Eel Pie Bridge



*View of the Wharf Lane Building from Eel Pie Bridge*





## **10 | Riverside Activity Area**

## Riverside Activity Area Activating the Waterfront

The principle of locating a boat storage facility in front of the flood defence wall by the Wharf Lane building was discussed with the Environment Agency. It was agreed that this would be possible provided it met certain criteria: -

- Flood defence wall to be visible through structure (no back) for inspection
- Top of flood defence wall to be visible from above for inspection
- Structure to be water permeable and floodable
- Structure to be easily removable/demountable to allow repair work to the flood defence wall
- Various meetings have also taken place with a number of local interest groups and clubs to gauge the level of interest in such a facility.

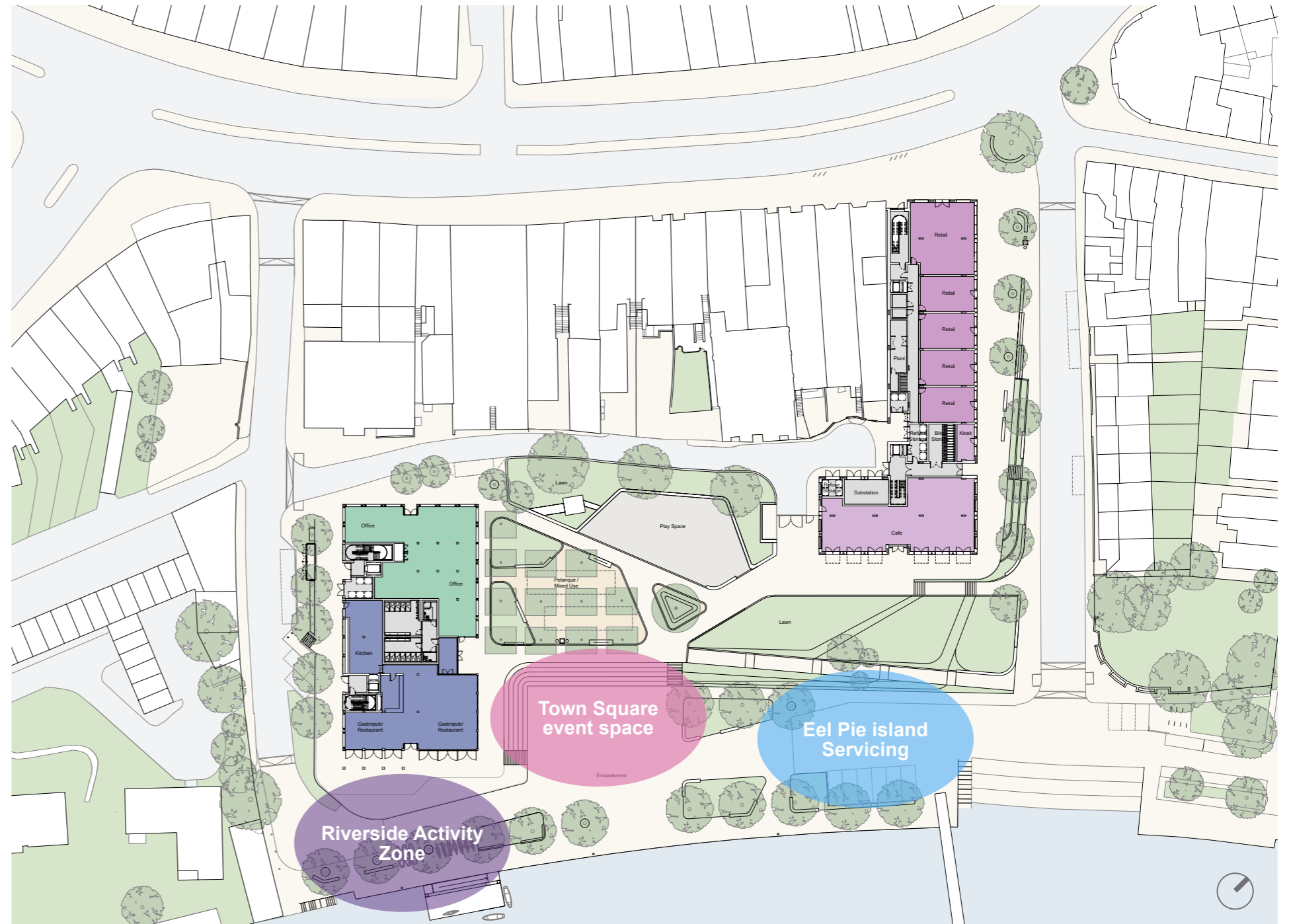
Various meetings have also taken place with a number of local interest groups and clubs to gauge the level of interest in such a facility.



Richmond water front has a series of boat houses and informal boat storage

### KEY:

- Retail
- Cafe
- Pub / restaurant
- Office / retail



Creating a key activity space on the embankment

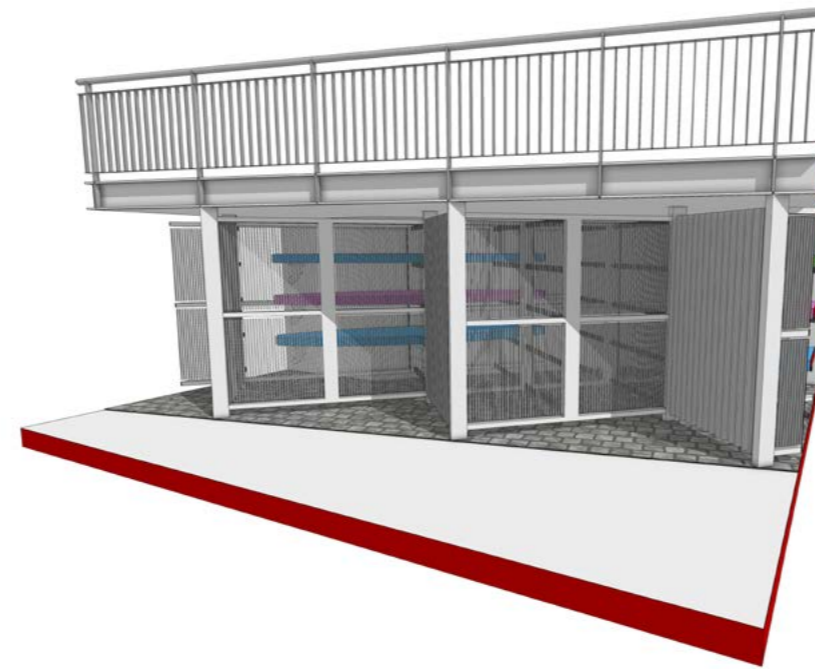


*View from the end of the embankment with the river activity area in the foreground*

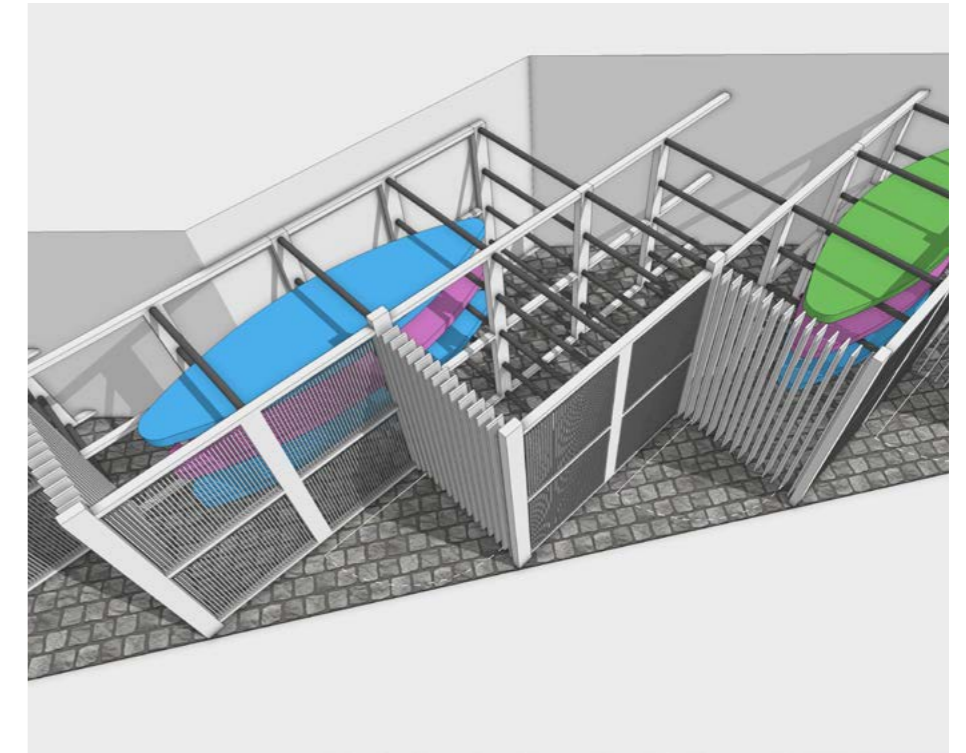
## Riverside Activity Area Boathouse Proposal

The proposal is to arrange a series of bespoke prefabricated storage lockers in front of the flood defence wall. These would be set at an angle of 45 degrees and staggered to provide a range of different depths to accommodate different sizes of paddleboards and kayaks. Each locker would have a lockable gate that would give access to 4 or 5 racks with rollers that would allow the boards to be slid in from the end thereby maximising the amount of storage space. There are nine boat lockers in total shown on the plans, as they are all individually lockable this would allow a great deal of flexibility in terms of how they could be allocated to individual groups and clubs. At the two ends the space available is not really suitable for storing paddleboards or kayaks so the assumption is these spaces could be used to provide storage for the oars, lifejackets, electric pumps and other items that need to be stored locally as well as possibly space for changing. Sensitive items would need to be stored at high level to keep them out of the flood zone and due to the need for the structure to be floodable the enclosure for the changing area may need to be provided by a curtain that could be raised up when not in use. Lighting could be provided along with a water supply to allow items to be washed down after use.

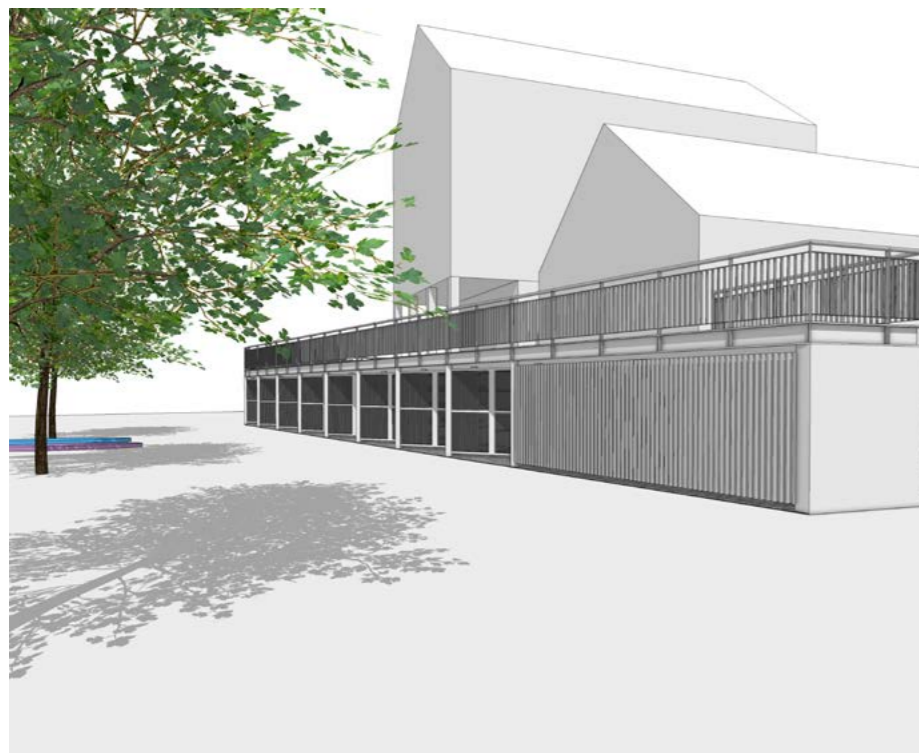
The boat storage lockers have been designed to support a deck above that would sit flush with the terrace in front of the pub/restaurant in Wharf Lane providing additional seating area with great views down the river. The lockers and deck above would be detailed to allow them to be unbolted for removal to provide access for repair work to the flood defence wall behind.



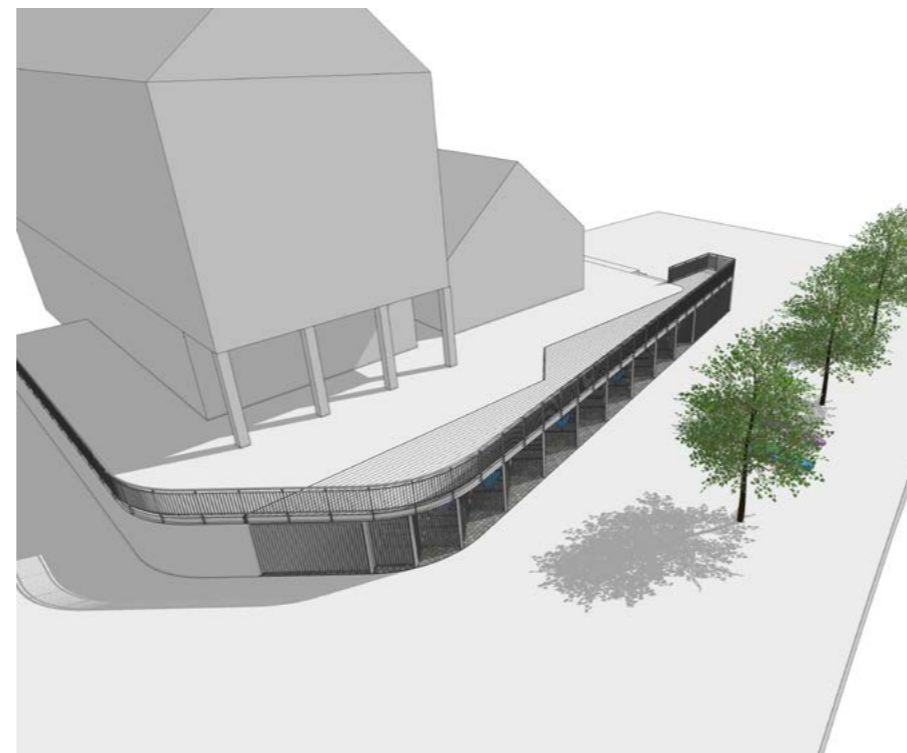
Removable sections of boathouse with metal grilles on sides to allow water flow



A series of rollers allow paddleboards and kayaks to slide into place in boathouse 'lockers'



The boathouse viewed from the east



The top of the boathouse forms part of the pub/restaurant terrace



The doors to the individual boathouse sections have a lightly different façade treatment made up of PPC metal bars with gaps to allow water flow

## Riverside Activity Area Boathouse Proposal

The intention is that the space on the embankment in front of the lockers could be used for laying out the paddleboards and kayaks before they are taken down the accessway to a new floating pontoon located in front of the Wharf Lane building to the east of the current steps and away from the existing Victorian boathouse. The pontoon has been discussed in principle with the PLA and the Harbour Master but it is acknowledged that at the next stage of design further meetings will be needed with the EA and the PLA to develop and agree the proposals in more detail.



Plan of river activity area



# **11 | Structures, Services and Sustainability**

## Structures, Services and Sustainability Mechanical Services

### Above Ground Foul / Surface Water Drainage

Downpipes will connect to external gutters and valleys on pitched roofs. Downpipes shall be routed internally to the building.

Dedicated stacks or stub stacks will be provided on the ground floor retail and commercial areas to accommodate drainage of sanitary fittings in a tenant fit-out.

### Cold Water / Sprinkler System

A combined domestic cold water and residential sprinkler system (BS 9251: 2014 Category 2) will be provided in each building. . Separate water meters, accessible within the main risers, will be installed on the supply to each residential apartment.

Metered supplies will also be provided to all the retail and commercial units including pub/restaurant in Wharf Lane and café in Water Lane.

A separate CAT OH3 commercial sprinkler system (BS EN 12845:2015) will also be provided to serve both buildings. The intent is for this to be a shared system between the two buildings. This system shall comprise an electrically-driven duty pump set, with separate backup diesel-powered pump set and electrical jockey pump

### LTHW Heating and Hot Water Heat Generation

Low Temperature Hot Water (LTHW) will be generated via Air Source Heat Pumps (ASHP) to provide the total annual space heating and hot water demand for the proposed development.

In both buildings LTHW pipework will rise within the cores, with distribution at each floor level along circulation corridors. Heat interface units will be used to generate space heating and instantaneous hot water. Apartment heating will be delivered via underfloor heating.

Looped LTHW connections shall be provided within commercial units. Future tenants shall be required to install heat interface units as part of their fitout. It is assumed these will be used to serve fan coil units.

### General Ventilation

Apartments will be ventilated using Mechanical Ventilation Heat Recovery (MVHR) units located within a utility cupboard at high level. Attenuators will be provided to meet acoustic requirements. Ducts will terminate at window heads using metal ducts in order to maintain fire integrity. Fresh air and exhaust ducts will be arranged to avoid short circuiting and nuisance smells on balconies.

Kitchen hoods will be provided with a direct extract duct to outside via a louvre integrated within the façade.

Purge ventilation will be delivered via windows / doors onto balconies that can be locked securely open and rain sensors on all skylights.

Louvres will be provided at high level on the façade of the all commercial and retail units for mechanical ventilation installed as part of the tenant fit-out.

It is intended to facilitate a mechanical cooling strategy, via air conditioning systems installed within the commercial units.

Publicly accessible WCs shall be provided with a dedicated mechanical ventilation system (MVHR type) with fresh air supplied to lobby areas.

### Kitchen Extract

Kitchen extract systems shall be provided as part of the tenant's fitouts for the pub/restaurant and café.

A dedicated plant room at basement level has been allocated for use by the tenant of the pub/restaurant. This plant room is envisaged to house air handling equipment, including appropriate filtration, grease management and odour control equipment.

Provision for exhaust air has been made at roof level.

It is proposed that the Water Lane café kitchen shall be provided with a simple mechanical extract system with mechanical grease filtration only, i.e. no ESP, carbon filtration or UV ozone system. Discharge of the exhaust shall be at ground floor level.

### Smoke Ventilation

Central corridors within the residential developments will use AOVs at the ends of the corridor and AOVs at the head of each stair for natural smoke ventilation purposes.

The system will also regulate temperature within the circulation spaces by use of temperature sensors linked to the motorised actuators on each floor.

Floor breakout panels and natural ventilation shafts will be used for non-permanent smoke ventilation within the basement areas and natural ventilation louvres will be used where possible to provide background ventilation to plantrooms and refuse stores.



## Structures, Services and Sustainability Electrical Services

### Back-up Power Supplies

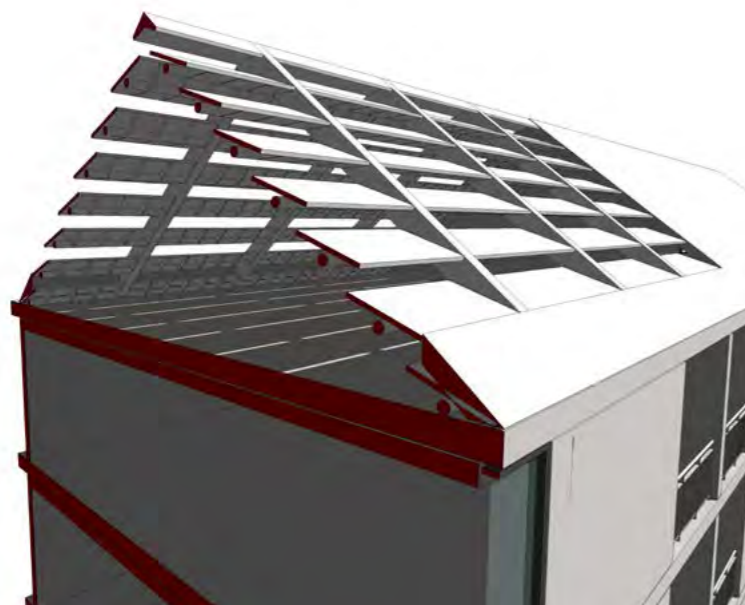
Battery back-up power will be required on the following essential services:

- Fire Fighting Lifts (x1 per building)
- Landlord telecommunications connections (also with UPS to cover change over period)

(Back-up to commercial sprinkler pumps is envisaged via diesel engine driven pump)

### Photovoltaic Panels

PV's will be used to meet local planning conditions for onsite renewables and carbon emissions, and will be fed back into the Landlords switchgear for use within the base electrical load.



The proposal is that the louvre blades for the rooftop plant rooms are sized to support photovoltaic panels on the southern sides. By placing the PV panels in this location it means that the cables connections can be checked safely from within the plant space rather than requiring access across the residential roofs and they can also be cleaned safely from within the plant room to maintain their efficiency. Louvring the plant rooms on both sides provides good cross flow of ventilation to allow the air source pumps to work efficiently.

### LV Supply and Distribution

An incoming LV panel will be provided in Water Lane, which will include the bulk electrical meter. A similar incoming LV panel will be located in the Water Lane building. Both panels will serve flat consumer units a landlord's switch panel, and individually metered supplies to retail and commercial units.

Central electrical metering will be provided complete with monitoring and data logging.

### Lighting

All residential light fittings will be LED and designed in compliance with the CIBSE Code for Interior Lighting.

Residential lighting controls will be as follows:

- Apartments will be manual control with dimming as needed.
- Corridors and stairs will be switched by presence detection.
- Basement and plant areas will be based on presence detection.

Commercial and retail units will be supplied with the minimum luminaires necessary for wayfinding and emergency lighting functions.

WC and circulation areas are to be fitted with suitable down lights and / or bulkhead fittings with PIR control.

### Emergency Lighting

Integral emergency fittings will be used in all communal areas with 3-hour batteries and will include a central test facility. Where emergency lighting is not integral a standalone emergency lighting system will be installed with small LED downlights complete with local batteries and a central test panel.

### Small Power

In addition to fixed power supplies to fixed equipment, each apartment shall be provided with the following electrical socket allowance as a guide:

Consumer units to residential units will include Arc Fault Detection Devices (AFDDs) or equivalent as enhanced fire protection.

### Telecommunications

Virgin and BT OpenReach infrastructure will be provided in each apartment. Incoming telecoms ducts will be provided in the commercial and retail areas for tenant fit-out.

### CCTV

The proposed CCTV installation will consist of internal and external CCTV cameras to the following areas:

- Building external perimeter
- Ground floor entrances and receptions
- All final exits / exit lobbies
- Lift lobbies on each floor
- Lift cars (TBC)

Signage will be provided to alert visitors that a CCTV installation is operational in the building and around external landscape areas.

### Access Control

A video door entry intercom is to be provided from the ground floor entrance points linked to each residential unit and concierge room. Fob controlled access is to be provided to the main entrance doors to buildings' lobbies, bike stores, and bin/refuse stores from outside or inside the buildings.

### Fire detection and alarm

Smoke detectors linking to the smoke control system will be installed throughout communal areas in corridors, stairwells, amenity or reception areas and throughout the building.

The smoke extract alarm panel serving all common areas and the main fire alarm panel will be located at the ground level main entrance with easy access for the fire services.

The residential fire alarm system will be designed and installed in accordance with BS5839-1 Category LD1 (studio/open plan flats) and LD2 (maisonettes).

Each apartment will be provided with mains operated smoke and heat detector / sounders. It is envisaged that the system in each apartment will be standalone in terms of alarm sounding and will not form part of the main building system. Multiple detectors within the same apartment will be linked together.

## Structures, Services and Sustainability Sustainability

### Environmental Design

The development shall comply with the requirements of both the GLA New London Plan and LBRuT Local Plan.

Developments must show CO2 emissions reduction through the energy hierarchy set out in the New London Plan.

- 1) be lean: use less energy and manage demand during operation
- 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
- 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
- 4) be seen: monitor, verify and report on energy performance

### Use less energy – Be Lean

The first step of the adopted energy hierarchy is to reduce energy use through both passive and active lean design measures. The basic principles of the building design are as follows:

- Balanced G-value and light transmittance (LT) glazing to optimise solar gains and internal daylight levels
- Good fabric performance through high levels of insulation and good air tightness
- No thermal bridging / good detailing

Additional active lean design measures that have been incorporated into the design also include:

- High efficiency mechanical ventilation with heat recovery
- High frequency LED lights and high efficiency lamps for light fittings
- Lighting controls linked to occupancy and daylight levels
- Sub-metering on all major energy consuming loads
- Use of an intuitive Building Management System
- Variable speed control on pumps and fans, etc.
- Optimised and compensated heating controls

### Supply clean energy – Be Clean

A review of information on existing, proposed and potential areas for district heat networks shows that there is currently no district energy infrastructure within the vicinity of the site. Although a connection to a district heating network is not currently feasible, a borough-wide study has identified Twickenham Station as a heat cluster with opportunities for a decentralised energy network.

A low-emission LTHW system is being proposed from centralised plant within each building, and space and infrastructure allowances will be provided to easily connect a future district heating network.

### Use renewables and LZC technology – Be Green

The final reductions in energy consumption and related carbon emissions are through the use of on-site renewable energy sources in the bid to reaching net zero carbon.

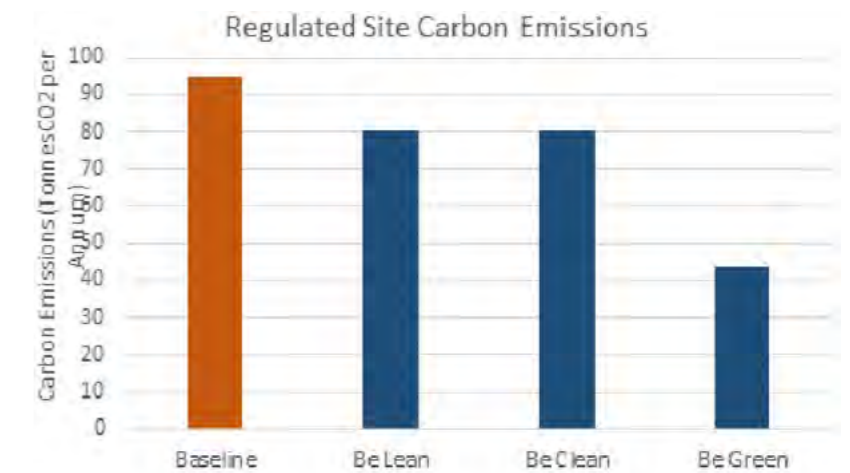
Air-source Heat Pumps are a very efficient way to generate hot water and heating and will cover a large proportion of the carbon savings within the development.

In addition to the provision of heat pumps as a low or zero carbon technology, PV panels are also proposed to effect a further reduction of site commercial CO2 emissions.

### Carbon Emissions

The energy demand assessment shows that the measures outlined in the Environmental Design Strategy give an overall on-site reduction in CO2 emissions of 54% compared to Building Regulations Part L – exceeding the minimum 35% target for commercial and residential developments.

The remaining carbon will be offset for the next 30 years through a cash-in-lieu contribution.



## Structures, Services and Sustainability Sustainability

### Water Consumption

Water efficiency measures will be incorporated into the design to reduce water consumption as far as reasonably practical, and it is envisaged a 40% reduction in water consumption will be achieved.

The design shall incorporate water saving strategies primarily through the provision of water efficient fittings-based approach, such as low flush toilets, low flow showers and non-concussive spray taps in an effort to keep the maximum water usage to 105 litres per person per day.

Water meters will be provided on all supplies to residential apartments. All new meters will be billing meters which shall incentivise occupants to reduce their water consumption. All landlord supplies to the residential and commercial buildings will be sub-metered to enable usage to be monitored and managed.

Major water leak detection equipment will be fitted to the incoming supplies, which shall be capable of detecting any major uses of water and cutting off the water supply if a usage indicative of a leakage is detected.

### Overheating Risk Analysis

Proposals to mitigate against the risk of overheating take an integrated approach to noise, ventilation and overheating, without compromising good daylight levels and occupant control and comfort.

The results from the overheating risk analysis show that passive design measures successfully minimise overheating risk to a degree, but due to site constraints they are not substantial to meet assessment criteria in all cases. This is especially true when natural ventilation openings have to remain closed for noise, pollution, wind or safety reasons. In these cases, tenant active cooling will be sufficient to prevent summertime overheating.

### Sustainable Design

A BREEAM Excellent rating will be targeted for the Retail and Offices. On the basis of the proposed design, the Shell Only Design Stage BREEAM Assessment has identified a baseline target that exceeds the minimum 70% requirement for Excellent.

## Structures, Services and Sustainability

### Structures

#### The Site

The ground floor of the proposed buildings and the Diamond Jubilee Gardens are located above the 1 in a 100 year (+35% Climate Change) flood level, with a Flood Defence Wall forming the step down to the Embankment.

#### Sub-structure and Basement

A Phase 1 and Phase Site Investigation has been undertaken, which identified that the ground conditions comprise a thick layer of made ground, underlain with Gravel, then Clay to depth. Based on the ground-conditions identified on site and the proposed building loads, it is proposed that both new builds are based on a piled foundation system. The detailed design of the piled foundations will be undertaken by a specialist piling contractor, in accordance with BS EN 1997. This will limit the settlement of the structure and isolate the frame from any ground movements or settlements.

There will be a single storey basement under the Wharf Lane building, housing plant and facilities for the commercial units. This basement box will be constructed from reinforced concrete and waterproofed (detailed design by specialist) to provide a water-proof environment. It is anticipated that a Class A (External Membrane) and Class B (Structurally Integral) system will be used to achieve the desired performance class to BS 8102.

Ground floor slabs, not over the basement, will be designed as suspended, spanning between piled foundations at column locations. Concrete in contact with the ground will be specified to suit the anticipated DS-1 / AC-1 classification, although in line with good practice, deeper foundations (piles) into the London Clay will be designed for DS-2 / AC-1s.

Note that significant cut and fill works will be required to enable construction of the basement box and the revised flood defence profile. Gas protection, including radon, is not required.

#### Super-structure

The super-structure / structural frame for both blocks shall be formed from a reinforced concrete flat slab structure. It is currently proposed to use a 225mm thick RC slab supported on RC columns, typically located on party wall lines. The grid has been carefully developed with the architectural proposals to provide a balance between flexibility and an efficient structural form, allowing for an efficient structural form, reducing the embodied carbon and sub-structural loads.

The superstructure is stabilised by concrete shear walls around stair and lift cores. Due to the limited length of the buildings no Movement Joints are proposed within either block.

Upper floors will generally be designed for a variable imposed loading of 1.5kPa plus 1kPa allowance for partitions, in accordance with BS EN 1991-1-1.

Higher loadings are proposed as suits the usage for commercial, circulation and plants spaces.

All concrete will be specified to use cement replacements, primarily GGBS to reduce the embodied carbon of the frame. Additionally the use of Recycled Aggregates will be specified.

The use of void-formers and Post-tensioned concrete had been considered to further reduce the volume of concrete, however these did not offer appreciable benefits over the relatively efficient flat slab design.

On the Wharf Lane building it is proposed that the upper floors oversail the ground floor footprint on the South elevation. These areas will be supported on an external colonnade, thermally broken at the head, to avoid a cantilevered structure.

External balconies are anticipated to be formed from either pre-cast concrete planks supported off thermally broken balcony connectors or a proprietary steel frame balcony.

#### Roofs

It is proposed that the pitched-roof to both blocks will typically comprise a series of pitched CLT panels supported on intermediate glulam beams, located on party wall lines. A steel framed roof structure will be used to support the plant louvres over the roof-top plant area.

Flat roofs will be formed in reinforced-concrete and externally water-proofed and insulated.

#### Pub / restaurant

A single storey pub/restaurant is proposed to the Southern end of the main Wharf Lane building. The frame for this shall comprise a Glulam Portal frame supporting CLT roof panels.

In accordance with Building Regulations Approved Document Part A these buildings are Consequence Class 2b and the structure shall be designed to provide effective horizontal and vertical ties within the primary framing.