OVERALL MASTERPLAN CONCEPT

1:2500

The most favourable elements of the density + capacity studies are combined to create a preferred site strategy (diagram below). This initial layout is then tested and developed to a greater level of detail (site layout left). Three distinct character areas of the site are established in response to the Urban to Rural shift suggested by the Pre Application response, with the character of the intermediate area providing an opportunity to develop a vernacular distinct to Leckwith Quay and its water side. Development of these areas is explored further overleaf:

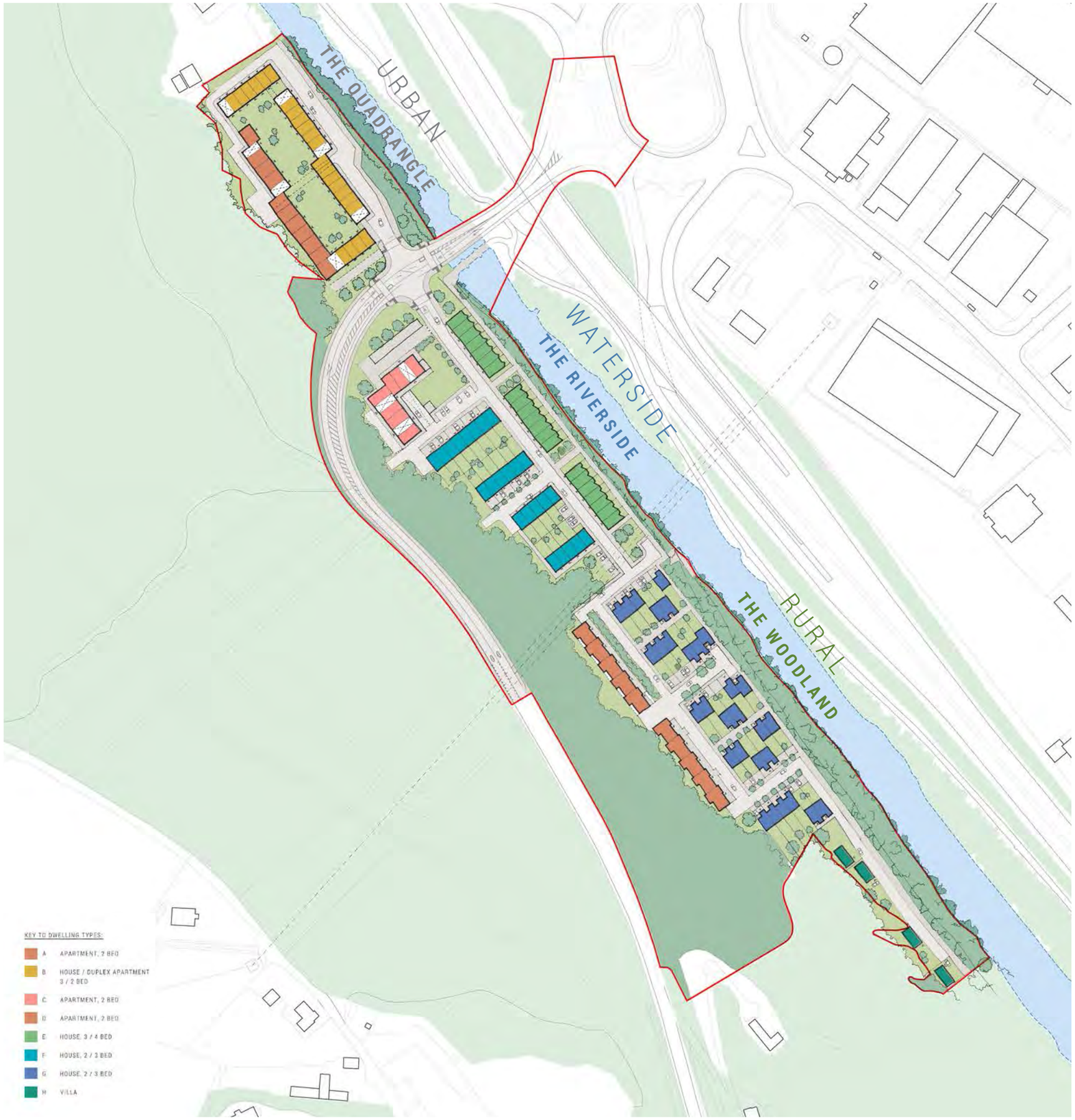
Urban - 'The Quadrangle';

Waterside - 'The Riverside' and

Rural - 'The Woodland'.

The initial masterplan provides an indicative dwelling mix of the following:

APARTMENTS	c.50%
DUPLEX DWELLINGS	c.10%
HOUSES	c.40%



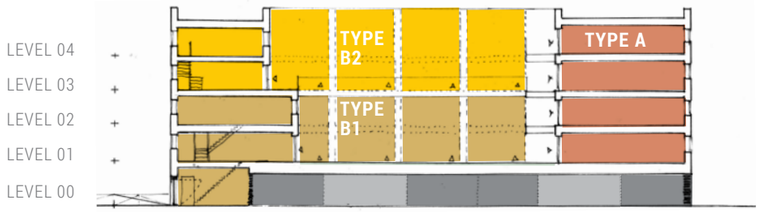
LAYOUT SKETCH

- Maisonette / Townhouse / Dual Aspect Apartments
- Courtyard Block
- Riverside Terrace
- Roads

LAYOUT DIAGRAM

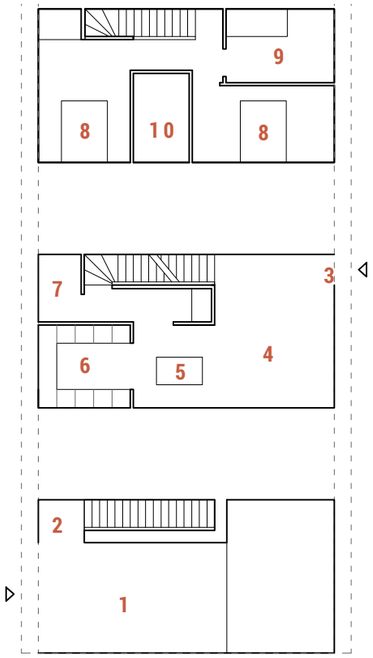
- Pedestrian and cycle routes
- Vehicle routes
- Key buildings
- Frontages
- Public open space

Precedent: variation in roof form
Mikhail Riches



Indicative section (not to scale) to show arrangement of duplex dwellings and apartments

3 Bedroom Houses
Design Development
Not to scale

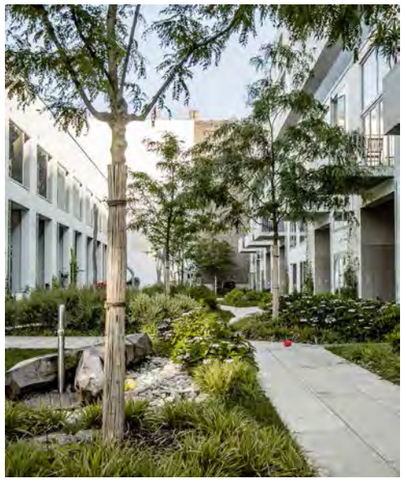


Second Floor Level 02
8 Double Bedroom
9 Single Bedroom
10 Bathroom

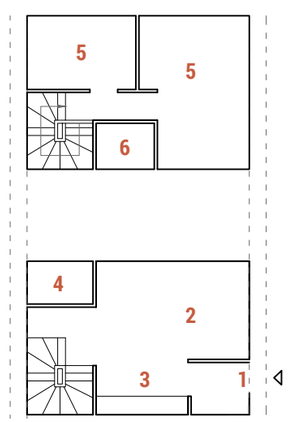
Main Entrance/Garden Level 01
3 Entrance from shared garden
4 Living
5 Dining
6 Kitchen
7 WC

Parking Level 00
1 Garage
2 Secondary entrance door with stair leading to dwelling

Precedent: a shared central garden
Zanderroth Architekten



2 Bedroom Duplex Dwelling Type
Design Development
Not to scale



Bedroom Level 04
5 Double Bedroom
6 Bathroom

Entrance Level 03
1 Entrance
2 Living
3 Kitchen / Dining
4 WC

Precedent: fenestration animates the facade
Nuno Piedade Alexandre

DESCRIPTION OF CHARACTER AREAS

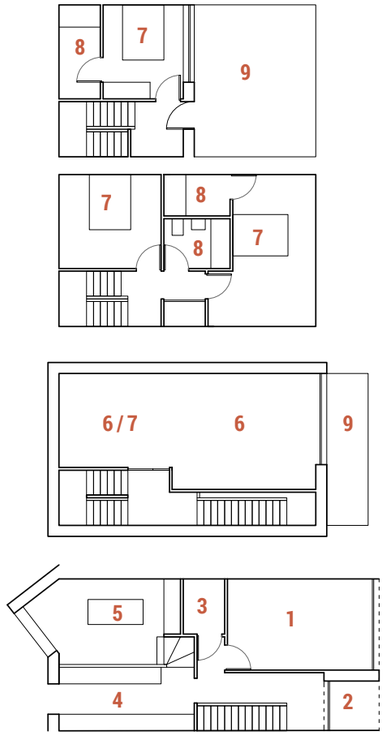
AREA 1 : THE QUADRANGLE

Area 1 comprises a perimeter block, with a shared central garden. Parking is situated in either private garages or in the car park underneath the shared garden. There are a variety of dwelling types, including houses, apartments and duplex dwelling types. Some dwellings have balconies or terraces.

The undercroft parking with podium level above provides the benefit of a shared garden space with direct access to the dwellings all fully accessible from street level. It is also a pragmatic response to site levels and flooding and the geotechnical constraints of the site. The preliminary geotechnical risk assessment identified that on the North Plateau the most suitable land use was for car parking, rather than private gardens and habitable rooms at existing ground level, c. 7-8.5m AOD. The approach of this block therefore allows parking at street level in the undercroft and private garages and allows an accessible design approach from the new road and pavement level into the site and to each dwelling and core.

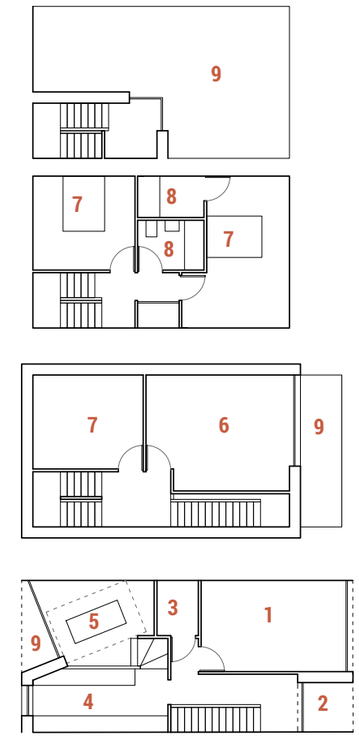
Apartments
Duplex Dwellings
Houses

4 Bedroom Townhouses
Design Development
Not to scale



1 Garage
2 Entrance
3 WC
4 Kitchen
5 Dining
6 Living
7 Double Bedroom
8 Bathroom
9 External Terrace / Balcony

3 Bedroom Townhouses
Design Development
Not to scale



3 Bedroom Houses
Design Development
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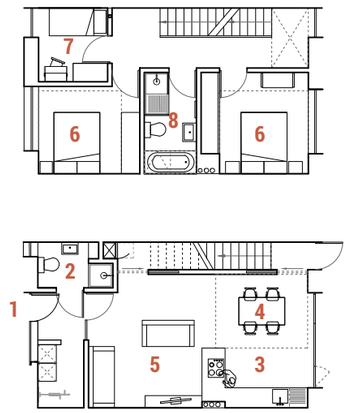
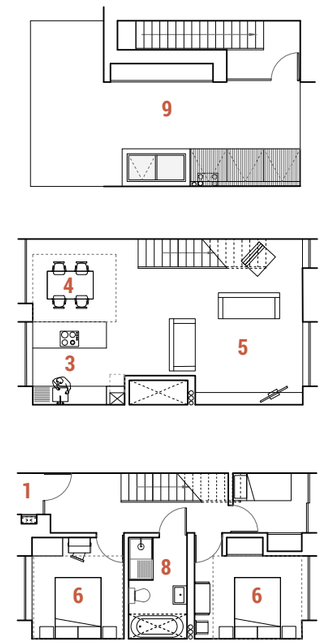


3 Bedroom Houses
Design Development
Not to scale



1 Entrance
2 WC
3 Kitchen
4 Dining
5 Living
6 Double Bedroom
7 Single Bedroom
8 Bathroom
9 External Terrace

DESCRIPTION OF CHARACTER AREAS

AREA 2 : THE RIVERSIDE

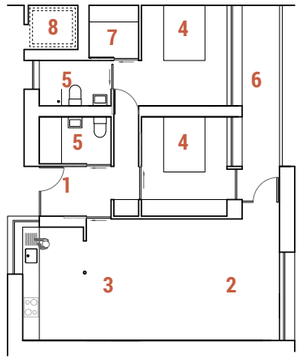
Area 2 comprises a mixture of apartments, townhouses and terraced houses. The apartments are housed in a block which addresses the new road alignment, and has a shared central garden with undercroft parking. Townhouses along the riverside provide an acoustic buffer to the rest of the site. A public walkway provides a pleasant pedestrian route along the water's edge.

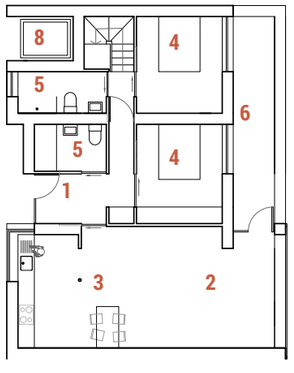
Apartments
Houses

Precedent: angles used for privacy and acoustic buffer
pH+

Precedent: materials used to animate the facade and frame views
Fundamental Approach Architects

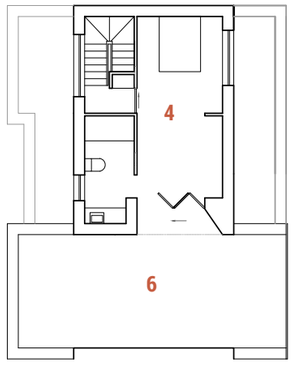
Precedent: Pitched roof terraces
AHMM





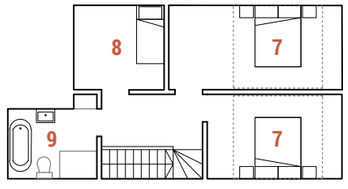
2/3 Bedroom Duplex Dwellings
Design Development
Not to scale

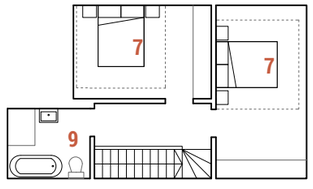
1 Entrance
2 Living
3 Kitchen/Dining
4 Double Bedroom
5 Bathroom
6 External Terrace
7 Utility
8 Lift/Store

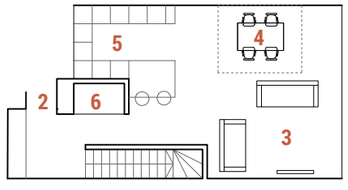


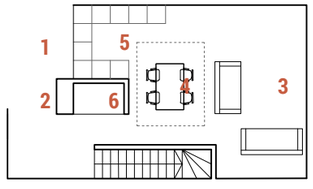
2/3 Bedroom Houses
Design Development
Not to scale

1 Parking
2 Entrance
3 Living
4 Dining
5 Kitchen
6 WC
7 Double Bedroom
8 Single Bedroom
9 Bathroom









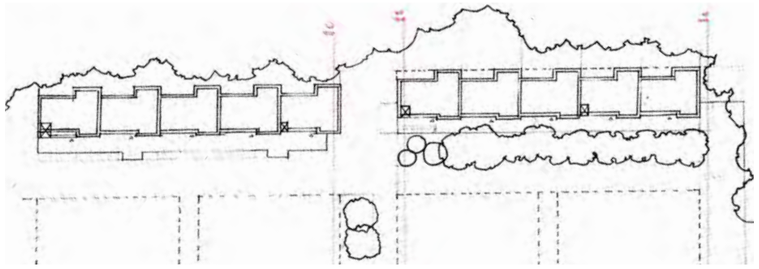
DESCRIPTION OF CHARACTER AREAS

AREA 3 : THE WOODLAND

Area 3 takes a more fragmented approach to the massing of the buildings. The plan below shows how a Duplex Dwelling typology began to emerge in response to the existing site levels. Where the site begins to rise to the West a duplex arrangement provided a lower dwelling with parking beneath at ground and first storey with an additional dwelling at second and third floor. Following acoustic testing this typology was then introduced to the waterfront part of the woodland site in order to provide a buffer to plots behind and the fragmented approach to the blocks was reversed. The later sketch alongside shows how this new arrangement helped to refine the approach to this character area.

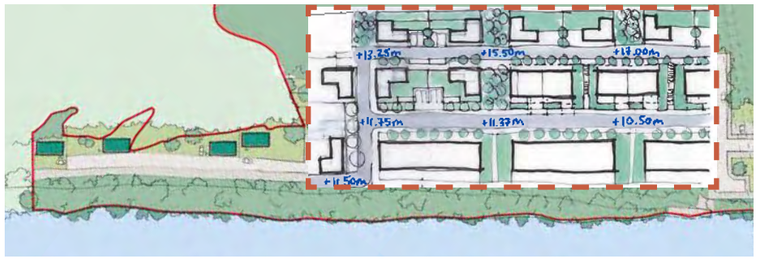
Duplex Dwelling Type

Houses

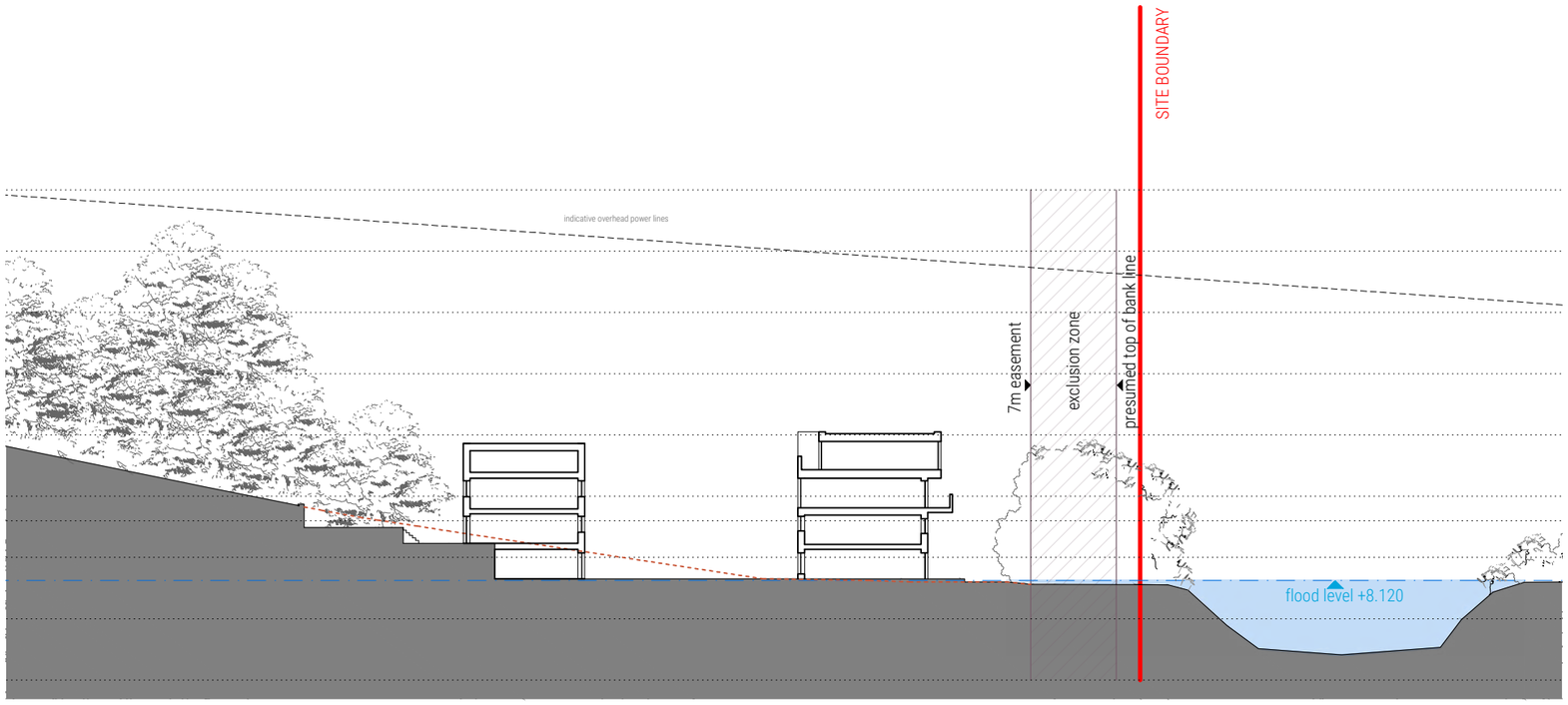


Precedent: a stand-alone courtyard house
Loyn + Co Architects

Precedent: lower density housing
S333 Architecture



Precedent: fragmented arrangement
Proctor Matthews



REFINEMENT

The proposal is tested against the key criteria identified at the end of the site analysis stage and refined into the overall masterplan concept.

PEDESTRIAN + VEHICULAR MOVEMENT

Access to the site is covered in the detailed planning application submitted in conjunction with this application. The design of the new access road has been a key driver in the organisation, massing and levels of the proposed masterplan. From the outset the aim was to avoid the new access road providing a divide between the North ad South plateaus. The podium level gardens between apartment blocks ensure there is a continuity between the new road and entrance levels to dwellings within the site, ensuring that these are fully accessible. As you enter into the site this approach to inclusive design principles continues with gradients and floor levels set to provide accessible entrances at street level.

ECOLOGY + FLOODING

From the outset of the design the approach to the mitigation measures of the Ecology report within the proposed masterplan has been to offset any areas of lost woodland elsewhere within the site and in relation to the SINC to go over and above in compensatory measures provided. The introduction of a drainage basin and wetland area to the North of the site provides a specific area for transplanting soil from areas across the site which have established a 'post-industrial' ecology unique to this site. In addition to this two further wetland areas have been introduced in the southern areas of the site along with swales proposed along the access road side. The proposed woodland walkway alongside the river and woodland track along the hillside offer the ecological benefits of the site to the proposed residents with these and other public open space and play spaces across the site to be kept naturalistic encouraging play through nature. Distinct wooded corridors have been introduced and maintained across the site from the outset of the concept design development.

PUBLIC REALM: FIGURE-GROUND

The public realm and spaces between buildings drove the layout of the masterplan to as great a degree as the massing and organisation of the individual dwellings and blocks. The unique location of the project has necessitated a landscape-led approach from the outset. The proposals take a pedestrian-first approach to the layout of streets and entrances within the site and the public realm aims to knit together the landscape character of the woodland to the West with the river to the East through a public realm strategy integrating mature woodland and wetland areas.

COMMUNITY SAFETY

As the adjacent sections show the design of the public realm and dwellings themselves have been developed to ensure that the proposals are self policing. The sections of the dwellings allow overlooking for passive surveillance of the public realm and the permeability of the site is limited to provide clear ingress and egress points in public areas.

LEVELS

With each iteration of the masterplan the proposal in relation to existing site levels is improved and refined to ensure that the final solution works as much with the existing levels as possible and as set out above to ensure that this also provides an inclusive design response. The site levels have been a determining factor in the design of many of the dwelling typologies developed for Leckwith Quay, in particular the Duplex Dwelling Types.

ENVIRONMENTAL SUSTAINABILITY

ENERGY STRATEGY

The proposed energy strategy has developed in response to the current services provision to the site and the historic attributes of the site as a self sufficient resource within the wider city. Following initial discussions with WPD it was advised that the current demand to the site would require reinforcement and that the site would require a new power supply. The initial estimate was that 3no substations would be required across the site, one to the North; two to the South. Substation locations are shown on the masterplan but it is hoped that these areas could become green energy stores if the strategy outlined below is implemented.

Clearly there is a lack of existing energy supply to and provisions on site and rather than creating new infrastructure that may prove redundant in the future, the energy strategy would benefit from a more holistic approach more in accord with Welsh Government directives and UK Government legislation. The Welsh Government has a clear strategy on low carbon housing and Zero Carbon will become the benchmark for future housing developments. On-site electricity generation to allow the development to feed back into the grid builds on the historic self-sufficient nature of the site and also its productivity in providing for the wider context. The energy strategy therefore aims to provide a self sufficient neighbourhood with on site electricity generation and storage. The roofs across the site are either green - for ecological benefits - or pitched with all south facing roofs to be constructed using lightweight, flexible solar panels laminated directly onto the roof material.

Dwellings are to be constructed to provide a high standard of fabric efficiency and accommodate a low-carbon heating system - storage provision is also made within dwelling types for battery storage. Homes can be fitted with a battery that stores excess electrical energy generated during the day and makes it available to the home when needed. It can also store electricity from the grid if necessary, topping up overnight when demand is lower and electricity may be cheaper.

The overall site-wide strategy for supplying services should be in accord with the Welsh Government's 'Achieving our low carbon pathway to 2030' published Feb 2019. This suggests ways in which the site can achieve the WG's goals through use of both renewables and 'green' electricity in lieu of gas. Principles for the Leckwith Quay proposals are:

FABRIC-FIRST APPROACH TO THE CONSTRUCTION OF THE EXTERNAL ENVELOPE

PASSIVE DESIGN STRATEGY - SOUTH FACING ROOF PITCHES AND PRINCIPAL LIVING SPACES. MASSING ORIENTATED TO AVOID OVERSHADOWING

ON-SITE ELECTRICITY GENERATION AND STORAGE

AIMING FOR A ZERO CARBON SCHEME

MATERIAL CHOICES:

Timber cladding with timber frame and prefabrication, e.g. CLT

Where there are higher storeys or significant retaining elements, masonry is proposed

LANDSCAPE + HABITAT

Integration of the ecological mitigation strategy has been a huge driver behind the proposed masterplan. This includes:

+ Introduction of wooded corridors to link the woodland to the west and river bank to the east.

+ Replacement woodland where areas have been lost to development / new road. Diagram below shows mapping of lost (pink) and replaced (yellow).

+ Replacement wetland areas and transplanted soil to compensatory areas to ensure post-industrial ecology of site is preserved in new wetlands areas.

WATER + WASTE MANAGEMENT

To support the energy strategy for the site the water and waste management strategies have also been considered. These are in accordance with the following principles:

+ SUDs - Use of permeable paving where possible and infiltration through rain gardens

+ Attenuation ponds also supporting biodiversity and the replacement of lost habitats on site

+ Storm water to be collected in storage tanks underneath car parks, once treated through the attenuation ponds

+ Foul water treated off site, and removed from site using a pumping station (location shown on plan)

+ Opportunity for rainwater collection for use in gardens

+ Vehicular access to dwellings for refuse vehicles - swept path analysis has undertaken to demonstrate that this is possible.

+ Bin storage for each dwelling has been considered

+ Proposed to minimise waste in the construction process through pre-fabrication

MATERIALITY + FORM

Materiality and form have been considered since the outset of the masterplan design development. Although a range of precedent studies were explored to help inform the boundary conditions of the site, it was the 'COUNTRYSIDE EDGE' examples that proved to be most informative in terms of developing a language and unique character style with regards to the form and materiality of the buildings at Leckwith Quay, to promote a vernacular fitting of this place and context. Revisiting our early site context character study it is therefore the more rural examples, particularly those found in nearby Dinas Powys, that have felt most appropriate to use as cues for the form and mass of the proposals at Leckwith Quay.

As outlined at the outset of this section, street- and house-types have helped to create legibility within the scheme. With a mixture of flat green roofs, roof terraces and pitched roofs with PVs orientated south, a variety of forms have been provided across the site. The concept of fragmenting the site organisation as the typologies become more rural means the quality of spaces between buildings also adds variety and interest across the site.

As the adjacent examples show the material shift corresponds to the shift in density as you move from Area 1 to Area 2 and then Area 3 at the opposite end of the site. The shift is also noticeable along the short length of the site which is the true axis between urban district and countryside edge. (See precedent credits on indicative layout pages).

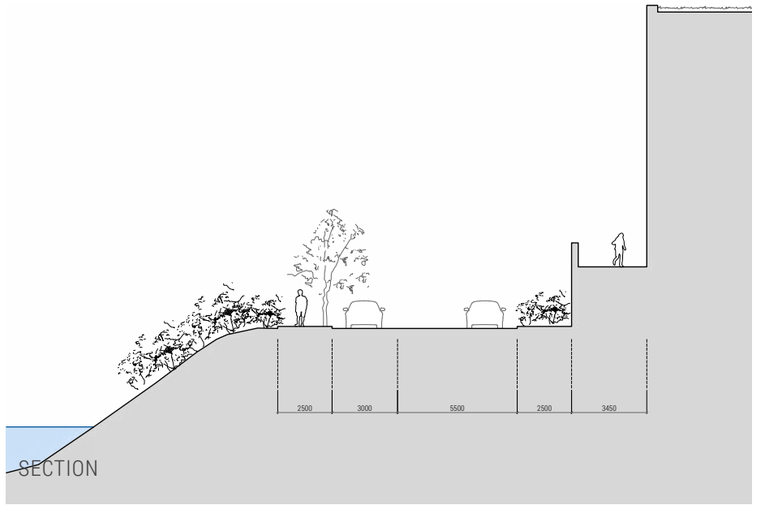
The Dinas Powys examples below illustrate how masonry and timber can be used tectonically across the site. Masonry blending to timber to denote the character shift but also masonry at lower level where retaining structure is required across much of the site with lightweight timber clad elements sitting above:

DEVELOPMENT OF STREET TYPES

AREA 1 - THE QUADRANGLE

STREET TYPE 1A

On-street parallel parking
Raised pedestrian walkway
Street trees and separating verge



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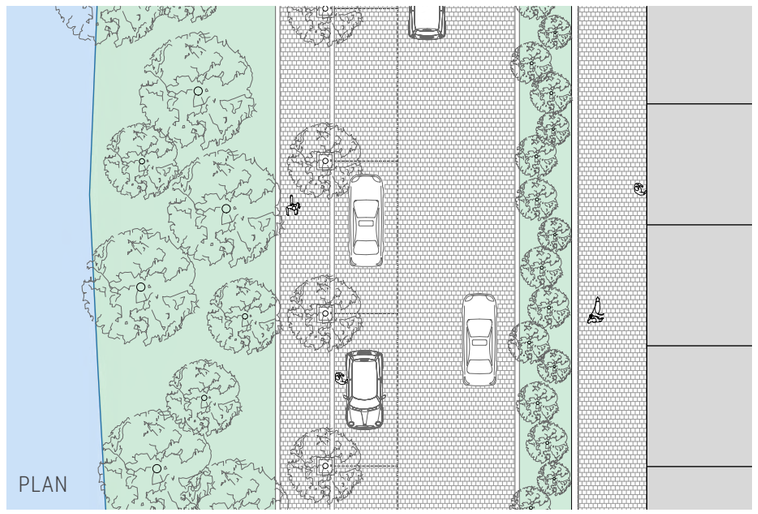
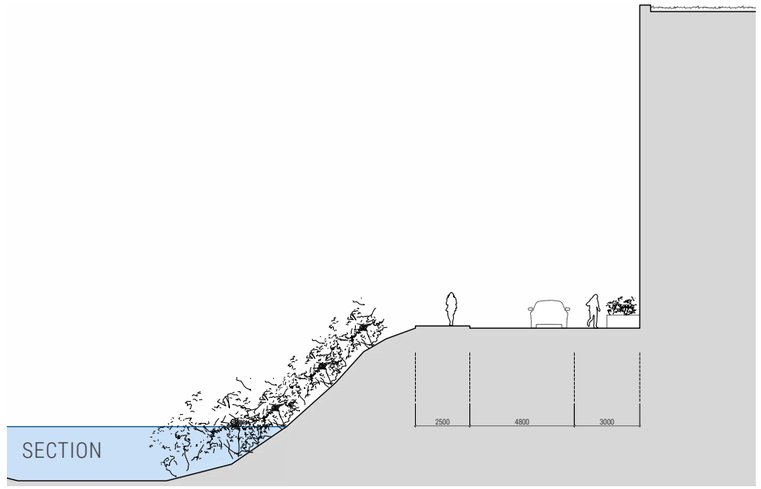


PLAN

STREET TYPE 1B

Private driveway parking spaces
Shared surface
Street trees and planters on private driveways



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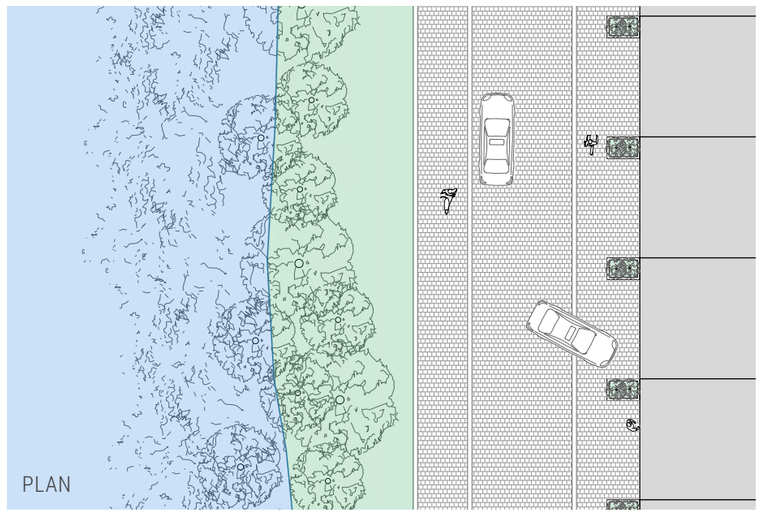
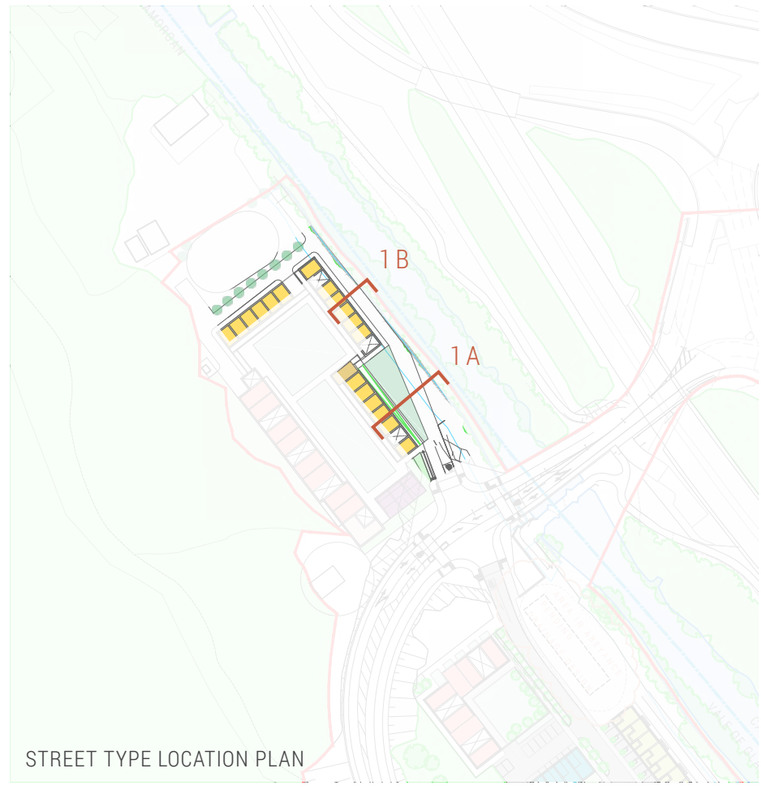


PLAN



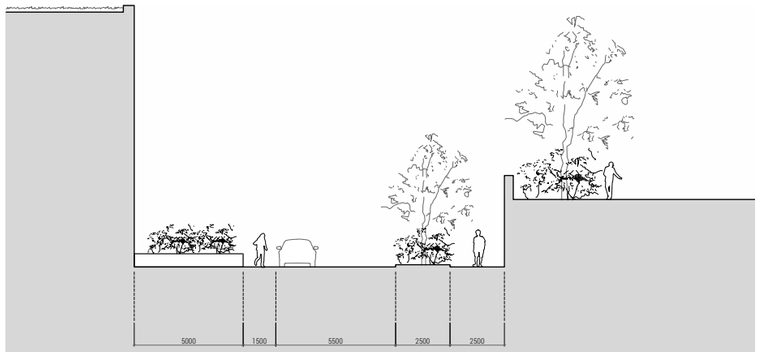
STREET TYPE LOCATION PLAN

DEVELOPMENT OF STREET TYPES

AREA 2 - THE RIVERSIDE

STREET TYPE 2A

Private driveway parking
Dedicated cycle / pedestrian lane
Street trees and separating verge



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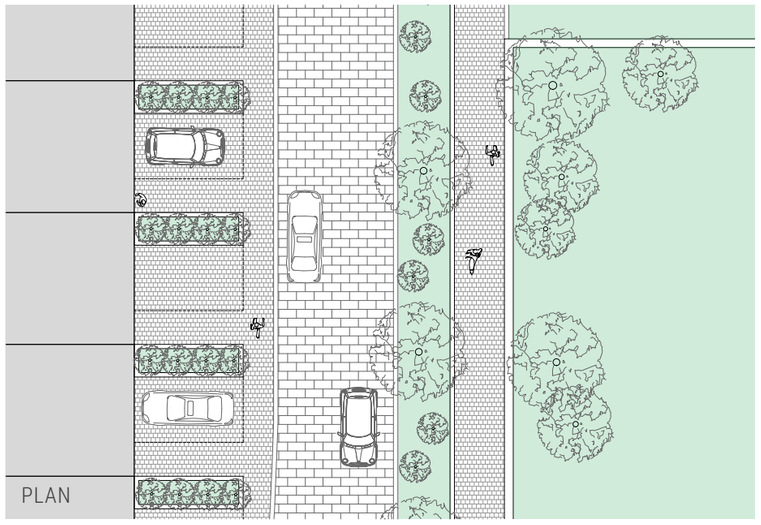
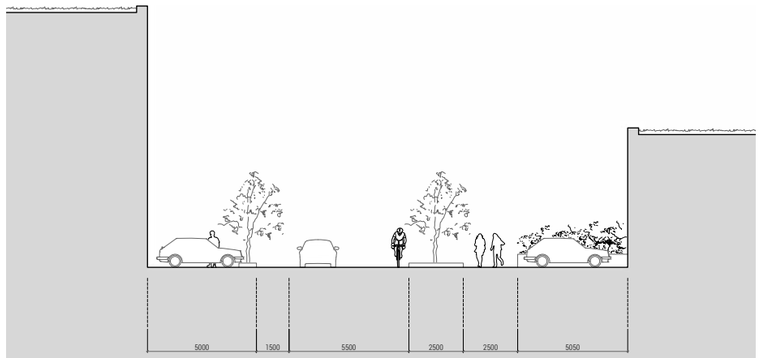


PLAN

STREET TYPE 2B

Private driveway parking spaces
Shared surface
Street trees and planters on private driveways



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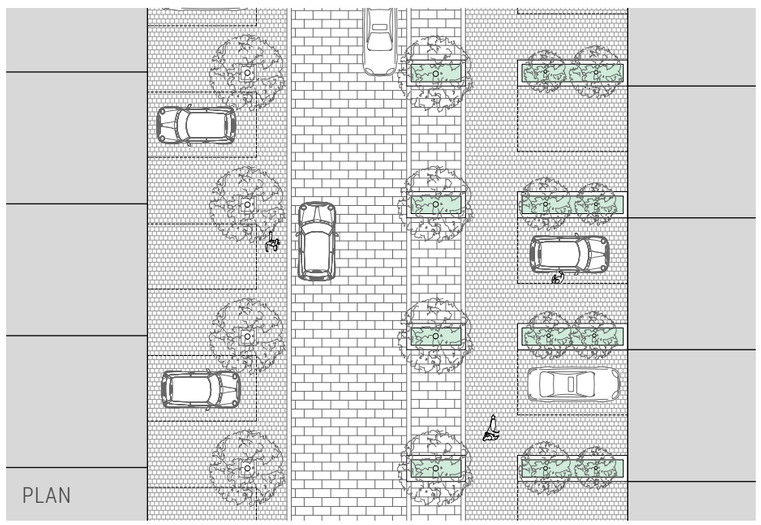
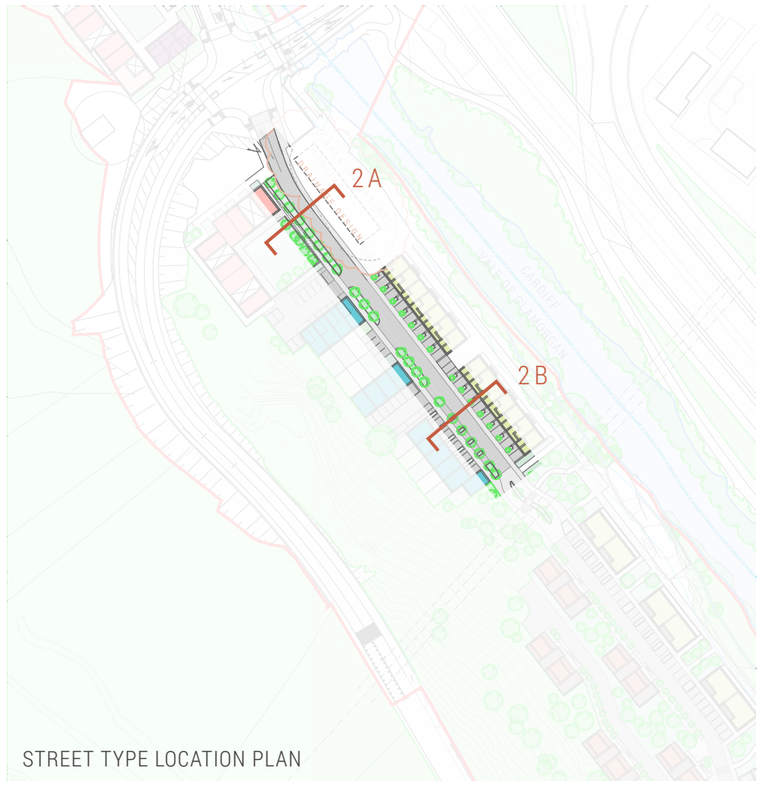


PLAN



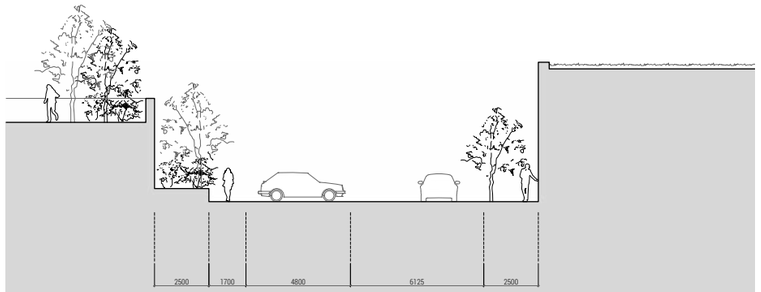
STREET TYPE LOCATION PLAN

DEVELOPMENT OF STREET TYPES

AREA 2 - THE RIVERSIDE

STREET TYPE 3A

On-street parking
Shared surface
Street trees and planters



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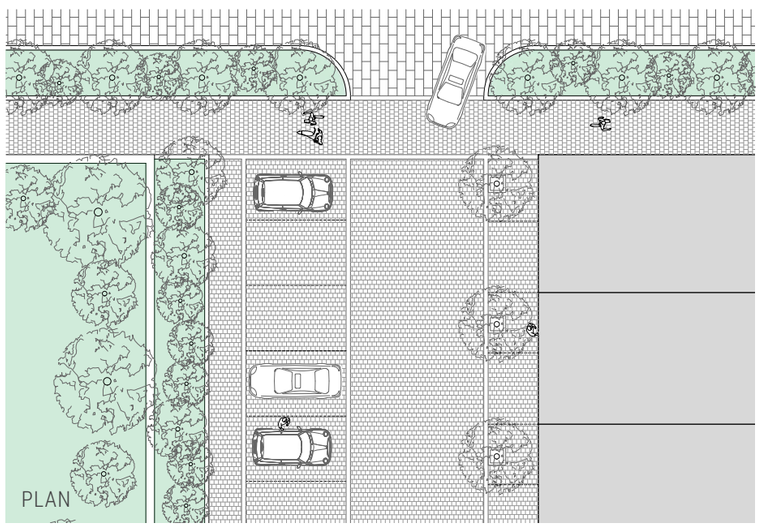
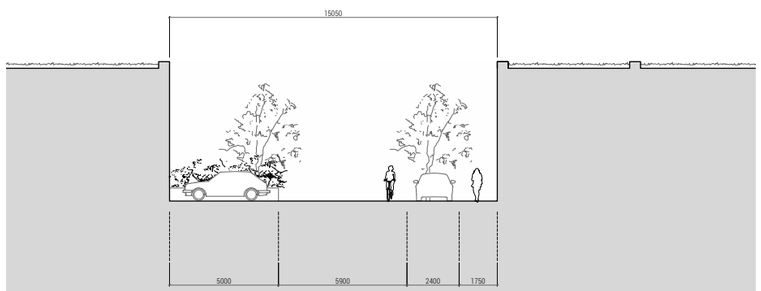


PLAN

STREET TYPE 3B

On-street parallel and private driveway parking spaces
Shared surface
Planters on private driveways



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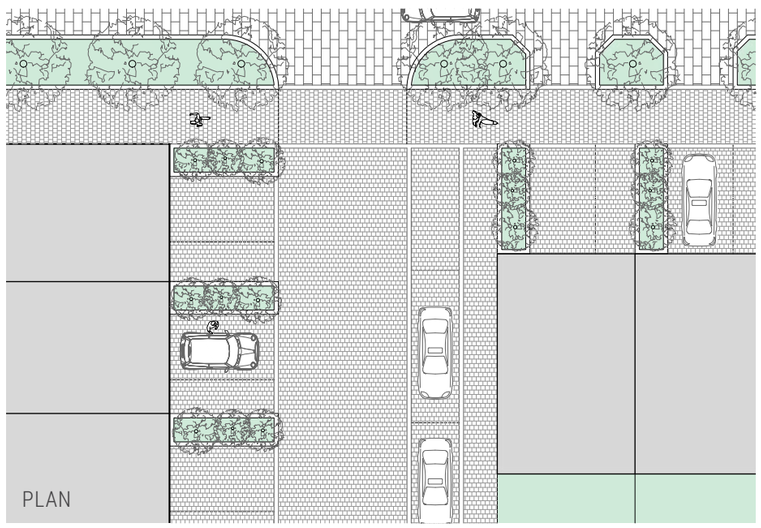

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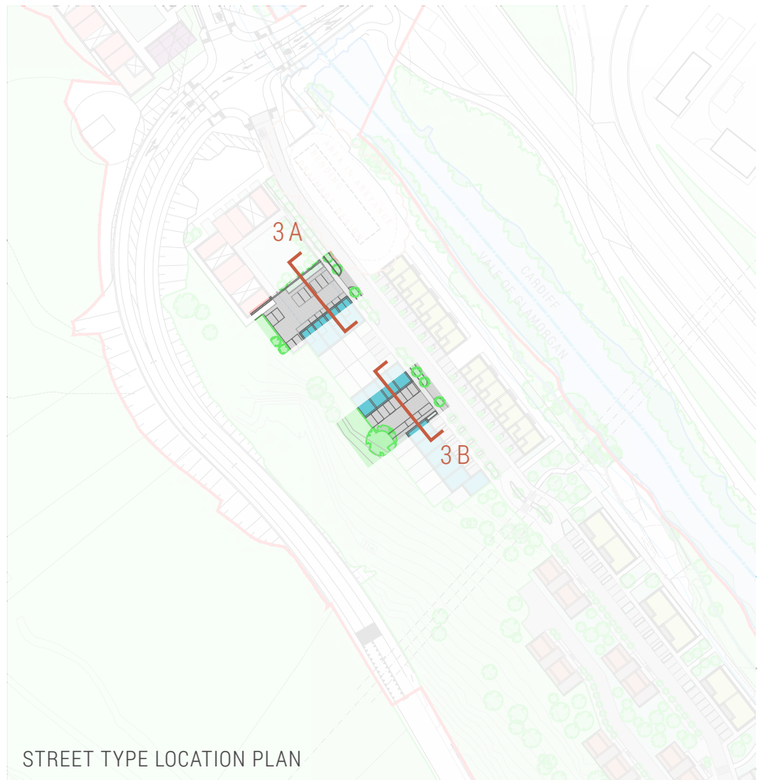

STREET TYPE LOCATION PLAN