6. Landscape

6. Landscape

6.1 Landscape Strategy

6.1.1 LANDSCAPE CONCEPT AND VISION

The hydrological, social and ecological systems in Cardiff Hendre Lakes formed the landscape over time. The drainage reens are part of a long history of land management. Stretching back to pre-historic times, this artificial system of land reclamation and drainage for agriculture has characterised the Gwent Levels, which is designated as a SSSI.

The history and ecology together with the surrounding reens and farmland will drive the strategy for the landscape to ensure that Cardiff Hendre Lakes responds sensitively to the context of the site. The landscape concept is defined by large-scale connected green, wildlife corridors that flows from the West, North and East to form an 'inverted V' shape.

The composite landscape parameter plan is shown on the opposite page, it outlines four key parameters that are further explained in this chapter: water, habitats, access, and public realm. The landscape strategy is guided by a set of eight principles that underpin the entire landscape vision, and a hierarchy of various functions and programmes. These will enable the landscape to function for a variety of users, ages and abilities who are on the site for recreation, work or leisure.

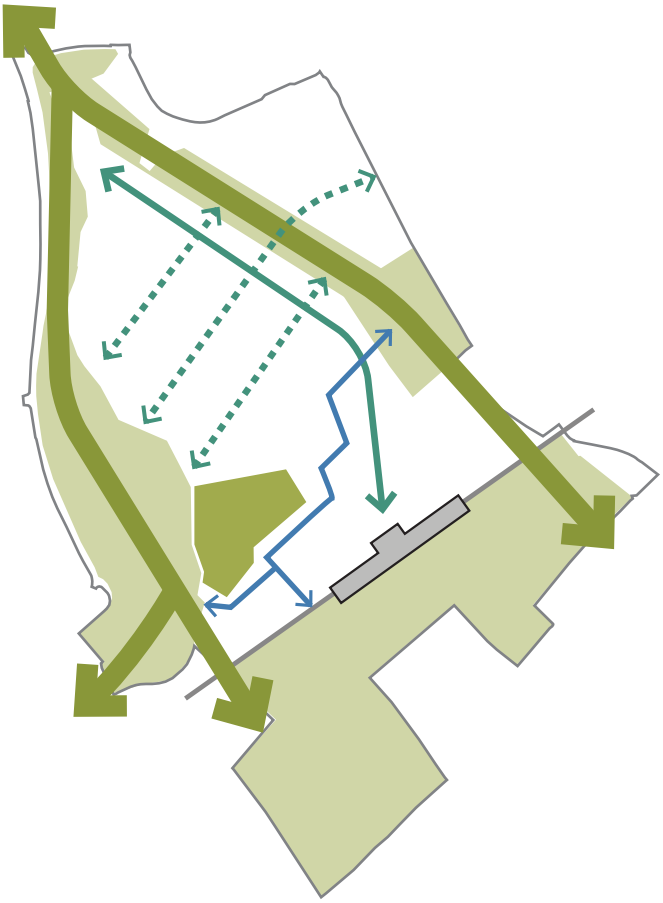


Fig. 61 | Landscape Diagram

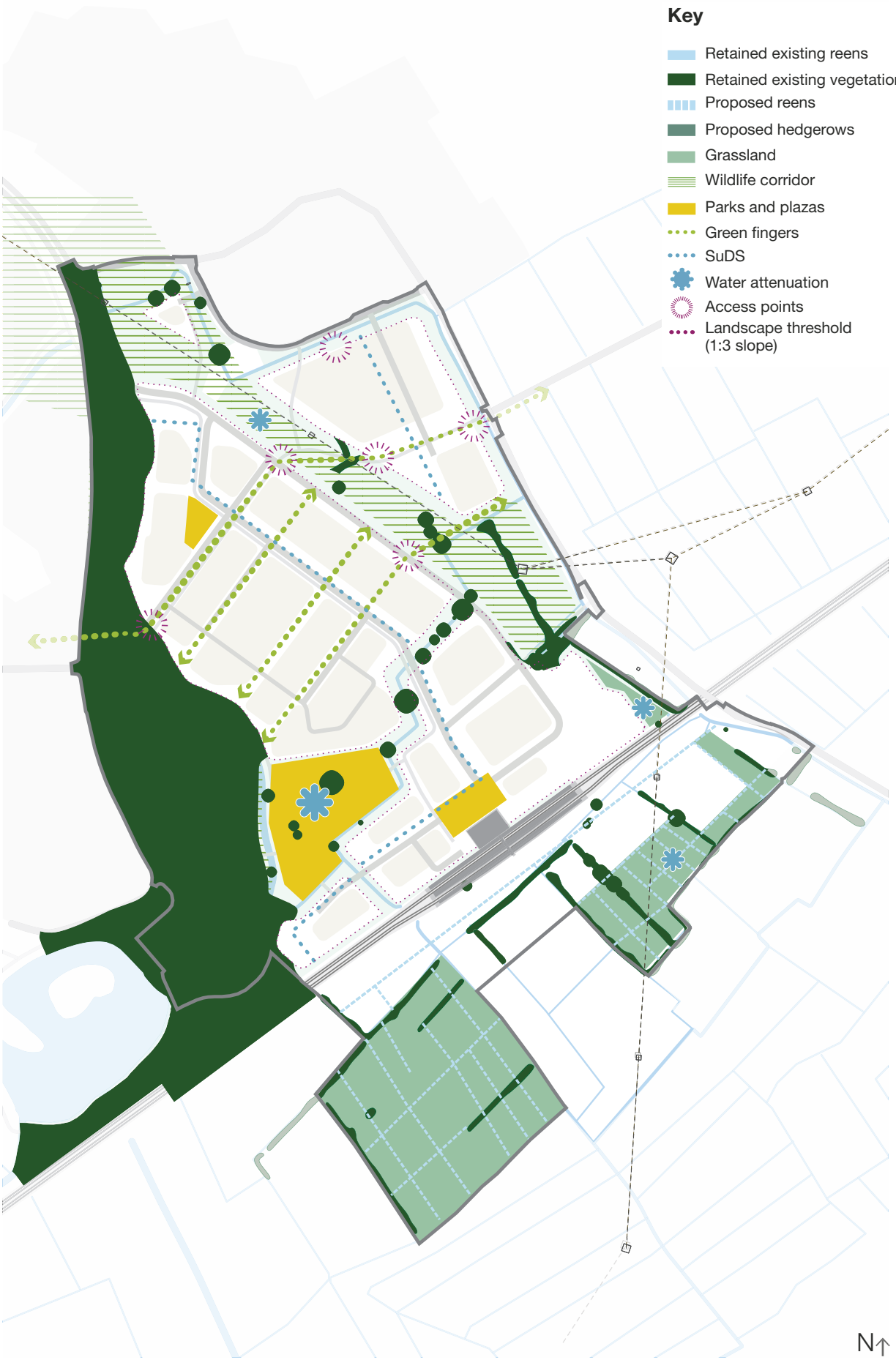


Fig. 62 | Landscape Framework

6.1.2 GUIDING PRINCIPLES

CONNECTED HABITAT

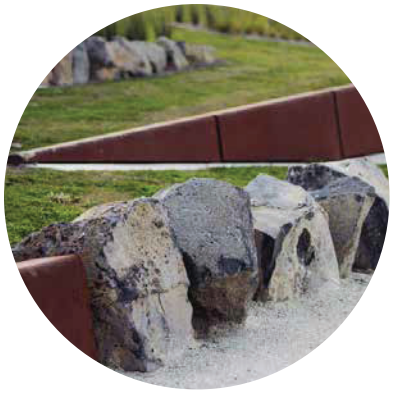
The development will provide a continuous and connected series of natural green areas. This large wildlife corridor preserves the existing rich habitats and enhances the quality and quantity of planting, providing opportunities for habitat mitigation as well.

CO-EXISTENCE

People and wildlife will share the site in mutually beneficial ways. By expanding development beyond a built environment exclusively for human consumption and comfort. The reen network of the area is home to unique native flora and fauna including some UK priority species. From the smallest vascular plant in the world to predators including otters and the little egret.

SUSTAINABILITY

The site development aims to re-use materials as much as possible, for example re-using soil, water, energy, and ensuring a local supply chain.



HEALTH AND WELL-BEING

The proposed development aims to improve public health and community well-being by increasing opportunities for recreation, play, active travel, improving air quality and minimising noise pollution among other things.

VARIETY OF LANDSCAPES

The wider development will include a variety of landscape typologies that fall within a hierarchy of scales, from large wildlife corridors, to medium sized parks and plazas, and micro habitats within buildings. These will have different programmes and functions that respond to the users and adjacent plots.

PRESERVING HERITAGE

The development is within a site of rich heritage value and man-made systems that date back to the Roman era. The design of the public realm will celebrate the memory and narrative of the place. This can be through wayfinding, public art or the use of landscape materials.

VIEWS

The public realm will optimize attractive views throughout the site, by offering a variety of views to the west and south where there are large natural areas and fewer visual obstructions.

THRESHOLDS AND EDGES

To navigate the different levels and edge conditions on site, the landscape will connect raised platforms with the lower reen-level in accessible, diverse and interesting ways. Terraces, stepped promenades, bridges and playful crossing points will optimise the level changes for different users of the space.

Fig. 63 | Landscape precedent images

6.1.3 LANDSCAPE FUNCTIONS AND PROGRAMMING

In order to activate the landscape and deliver aspects of the masterplan, it will be essential to provide a variety of functions and programmes in the landscape and open space network that are ecological, recreational and connective. Some of the main landscape functions are outlined below.

Function	ACTIVE TRAVEL	MEETING SPACE	PASSIVE RECREATION
What might it look like?	This includes a network of seamless and interconnected DDA compliant streets and paths that are safe, well-lit, comfortable and allow users to travel by foot or bike throughout the development. They contribute to a connected, permeable network. It also includes street furniture such as cycle parking and benches.	Meeting spaces are areas within the landscape network that offer places to sit, meet others or have lunch outdoors. These are strategically located in key open spaces such as Main Park and the Station Square.	These are unprogrammed open areas that provide a quiet spot for contemplation, tranquil nature walks or observing nature. They are open areas that respond to occupant and visitor needs.

PLAY

Play is embedded within the landscape framework in multiple ways. This would entail informal play areas such as splash pads water features in plazas, nature play, sensory play, art pieces, and more.

WILDLIFE

This includes pockets of species-rich habitats that provide ecosystem benefits for wildlife. They can range from large areas of wet woodland in the wildlife corridor, to small bug hotels in the parks and plazas.

WATERWAYS

Waterways are a primary feature in the landscape and they include the network of reens and permanently wet attenuation features in plots that convey water to the reen network.

SUDS

The open space network includes a hierarchy of SuDS that is present throughout the site in various ways. These are in the shape of wet or dry features and may include rain gardens, swales, filtration strips, detention basins, blue roofs and so on.

TRAILS

Some open space areas include trails for walks and cycle paths. These are connected to the pedestrian network along streets and informal walkways. These trails might involve subtle markings and some signage on ecological habitats, and information on the landscape heritage and reen network.

6.2 Landscape Framework

6.2.1 INTRODUCTION

The landscape framework plans in this section outline how the landscape and open space will work on site. They demonstrate the key principles that have influenced the layout of the proposed development, and set out the key parameters that will deliver a high quality landscape. The four landscape framework plans are as follows:

- Water;
- Habitat;
- Accessibility; and
- Public Realm.

Fig. 64 | Hendre Lake

6.2.2 WATER

The Gwent Levels, an extensive area of alluvial wetlands and intertidal mudflats are typified by their unique character and connection to hydrological systems. The Severn Estuary, which they are on the north side of, has the second highest tidal range in the world, reaching 12-14m.

REENS

The reens are part of a long history of land management within the Gwent Levels landscape. This system of land reclamation and drainage for agriculture has long characterised this part of South Wales. The reens are still in use, a living infrastructure which will be retained and celebrated through the development.

There is the potential for unrecorded archaeology in the peat of the reens and beneath the site. Peat can preserve artefacts. Any excavations and works will include a 'watching brief' to ensure that any artifacts are identified, evaluated and conserved.

Fig. 65 | Primary reen

FLOOD COMPENSATION

South of the railway there is a designated 3ha site reserved for flood water attenuation. This land will be lowered by 0.5 metres in the areas between the reens.

Fig. 66 | Flood compensation

SUDS

A hierarchy of SuDS will exist on site from attenuation ponds, to swales, rain gardens, blue roofs, permeable paving and attenuating tree pits. Every attempt will be made to deal with rain water at plot level. In addition to attenuating measures, soft landscaping and planting at ground and roof level will absorb direct rainfall, reducing run off and sustainably managing surface water.

Other areas to the north of the railway will be designated for water attenuation as well, such as the wildlife corridor and Main Park, and will be planted with wet woodland species and include flexible design elements to accommodate wet and dry conditions.

Fig. 67 | Highway edge SuDs (Grangetown)

Proposed changes to the reen network take various factors into account in terms of the layout and location. These include: the function of the drainage system, minimum spacing and offsets for grazing, sensitivity to the existing organic patterns, visual continuity with the wider surroundings and limiting disturbance to the ecosystem and potential archaeology beneath.

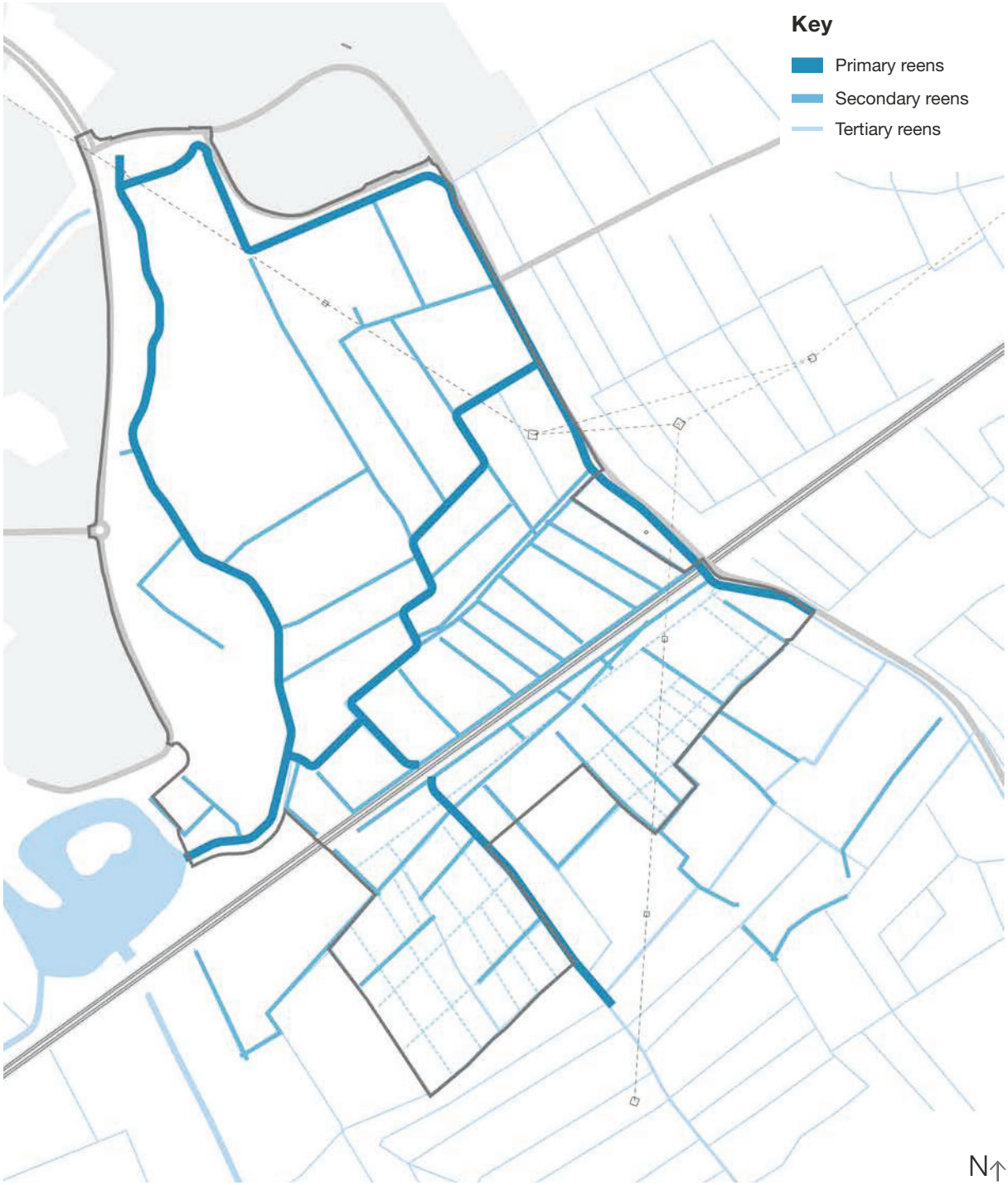


Fig. 68 | Existing Reen network categorised into types

Fig. 69 | Proposed Reen network

The development will include a wider network of hydrological features aimed at mitigating flood risk and managing surface water in a way which is harmonious with the natural environment and contributes to the character of the site and user experience. This will include features which help to create new habitats, as well as more engineered features which play a role in the structure of the public realm and built environment.

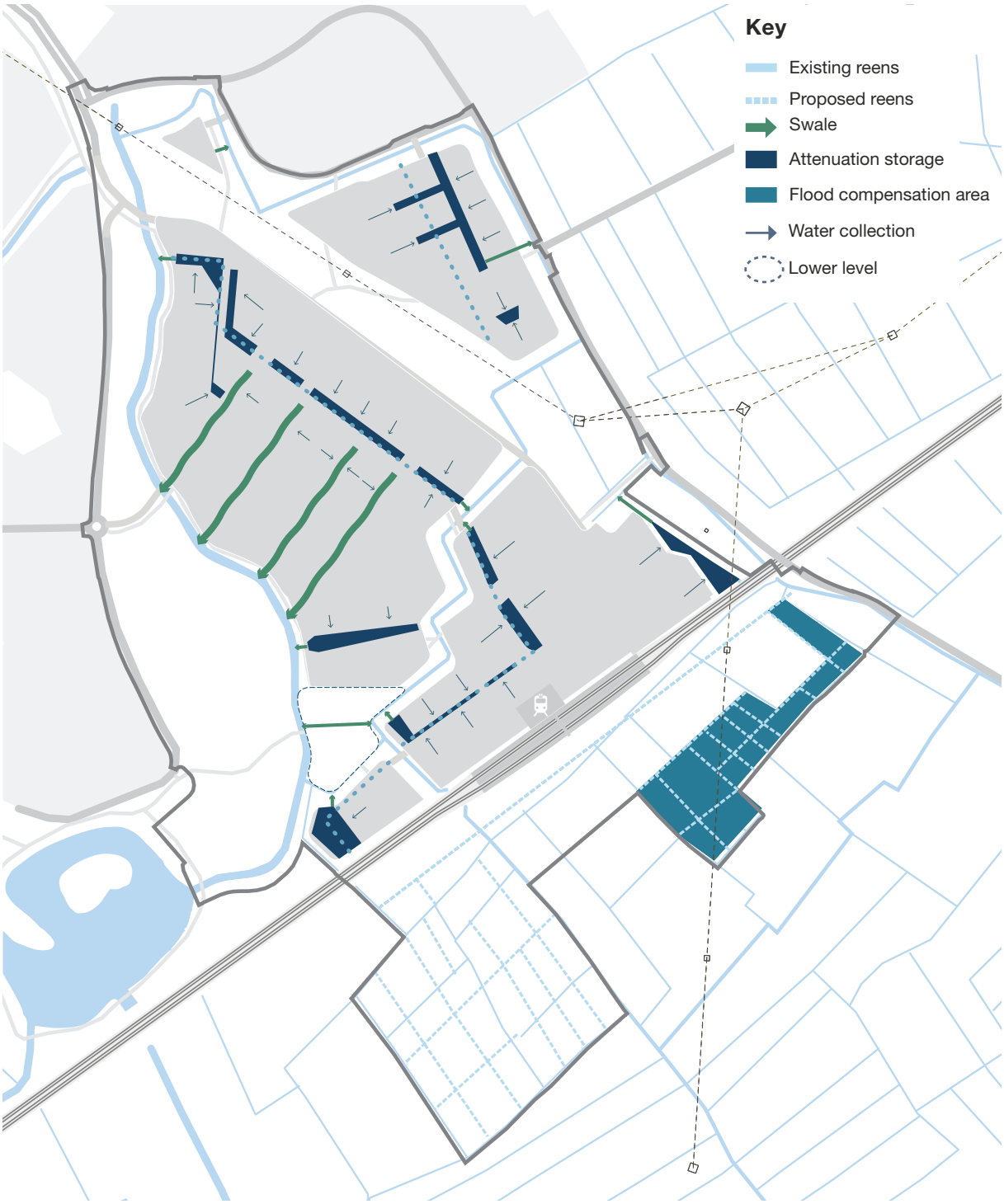


Fig. 70 | Key hydrological features

6.2.3 HABITATS

The ecological strategy for the development is to retain as much habitat as possible, create more habitat than is removed, and to work to a biodiversity net gain. Every attempt to create habitat will be focussed on principal aspects of the habitat network (the wildlife corridor, park and selected planting along Ty Ffynnon Reen). Land to the south of the railway is also reserved for ecological habitat.

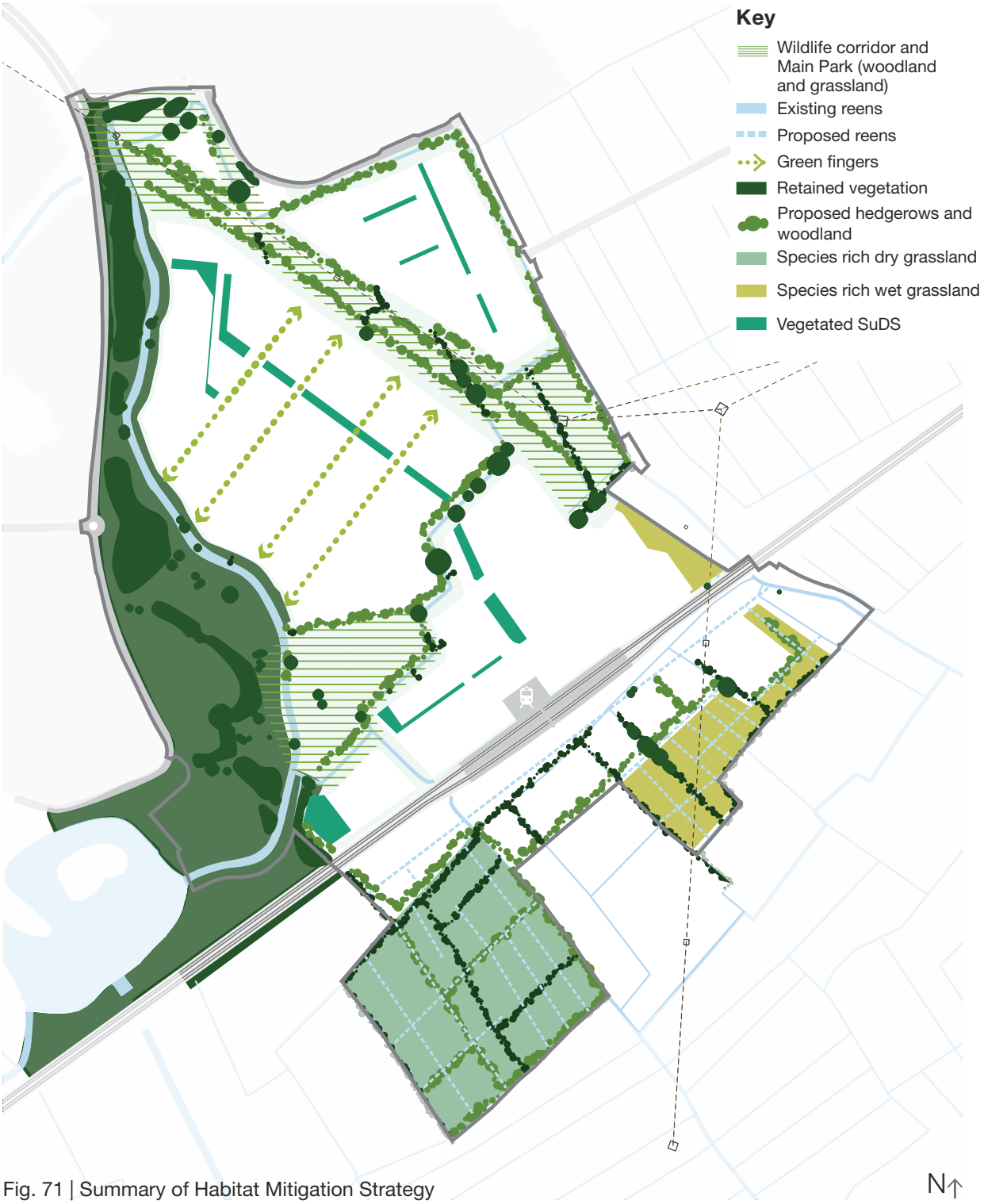


Fig. 71 | Summary of Habitat Mitigation Strategy

6.2.4 ACCESSIBILITY

The site and station will be fully accessible to vehicles, pedestrians and cycles with a hierarchical network of paths allowing safe movement. A series of trails through the natural areas and generous widths in the urban realm will support active travel, and the uplift of plots will allow for creative edge treatments.

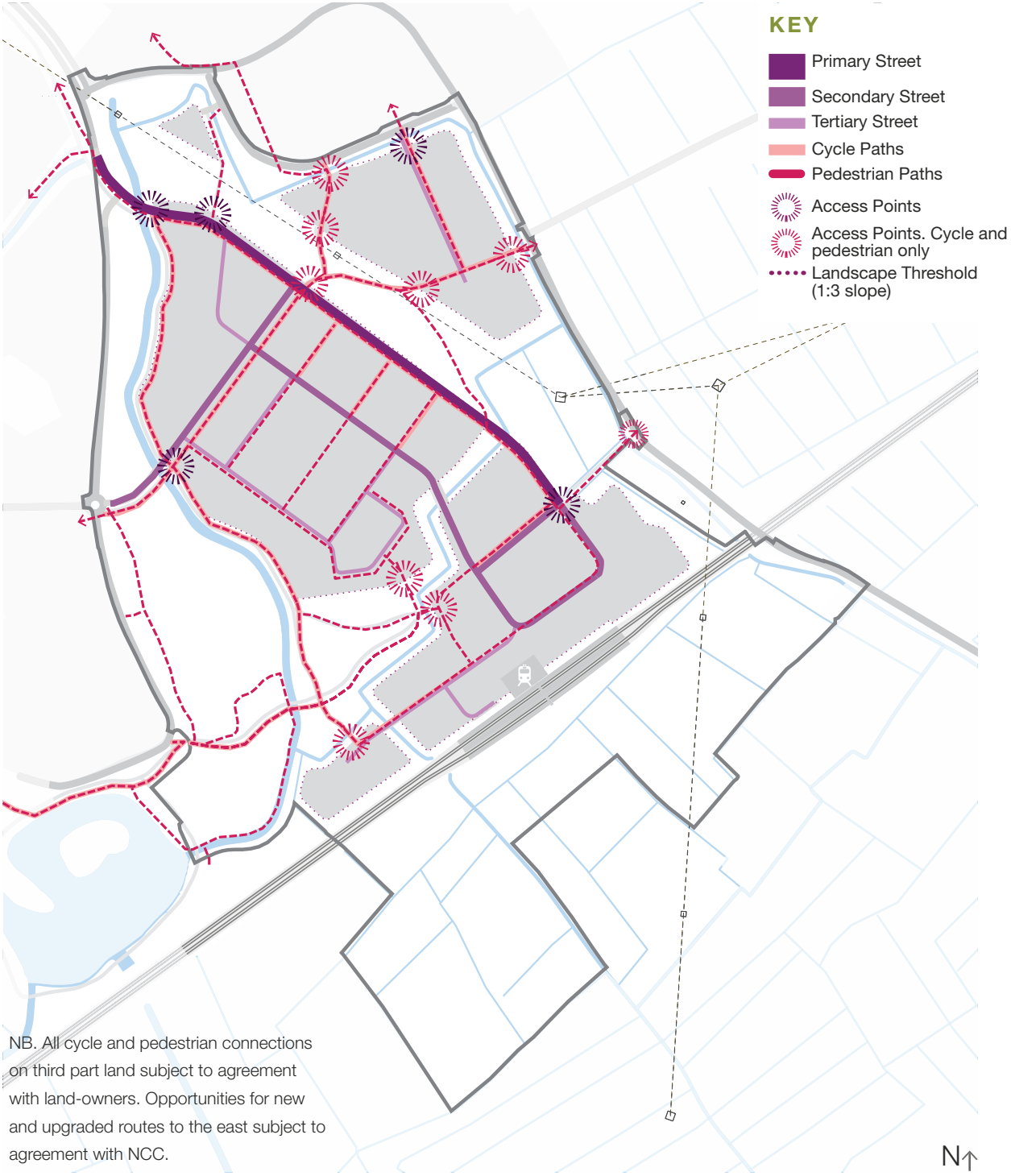
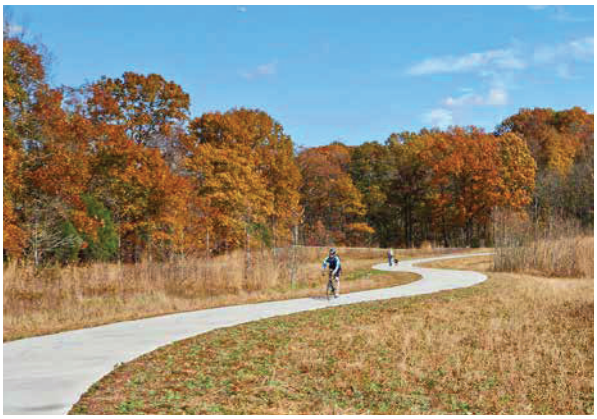


Fig. 72 | Access routes within and into site

ACCESS POINTS

New vehicular and pedestrian access points will link the development to the community from the north, east and west. New pedestrian routes will be created and, subject to agreement, cycle connections to the east and west improved - conecting to NCN and Cardiff cycleway. These will improve and encourage access to Faendre reen edge, Main Park from the west and within site over the central reen. The existing Public Right of Way will be retained and will connect to key routes in the proposed development. These access points are central to connecting the existing St Mellons community to the Station and the new facilities the site will offer.



LEVELS

The raised development plots provide the opportunity to offer a variety of different level treatments. Safe and free movement will be provided across site regardless of age or ability. Access will be provided for all.

EDGES

The site edge conditions provide a wide variety of interesting junctions between the urban and natural realms and between land and water. An approach of permeability will be adopted to soften these edges and create seamless transitions between spaces. The proximity of water will be celebrated by creating access close to the natural reens and the more formal waterscapes whilst maintaining the requisite offsets.

PUBLIC/PRIVATE

Active frontages and permeable edges will blend the boundary between the public and the private, extending the sense of the public realm. A cohesive design strategy will aim to create a legible series of spaces that are welcoming, safe and connected.

Fig. 73 | Landscape precedents

6.3 Open Space Typologies

6.3.1 OPEN SPACE CATEGORIES

The diversity of open spaces through site can be broadly categorised into three types: those more natural, more civic and the spaces that will later be provided on the plots themselves.

1. Natural Open Space

The site is closely integrated with surrounding natural open spaces, including unbroken wildlife corridors of rich and diverse habitats which help to frame the adjacent business parks and St Mellons residential areas. The proposed development will create large areas of new wildlife habitat and improve access to existing community landscape resources. Opportunities for play, events and gatherings will be provided by the creation of Main Park, a significant new public park near Hendre Lake.

2. Civic Open Space

The civic core of the site will feature high quality, welcoming, external spaces. A distinctive station square and a north-south public realm spine will be the focal points, providing a strong sense of arrival and character. A secondary series of parks and squares will be spread over the site. Comfort and social interaction will be at the forefront of design which will seek to encourage outdoor activity and promote well-being.

3. Permeable Plots

An approach to building and land use that maximises drainage in situ and creates and protects biodiversity will be adopted. Sustainable use of land and surfaces will reinforce the environmental profile of the new district and will embed the development in the guiding landscape principles of co-existence and sustainability. This will apply to buildings, parking and the smaller street network between, the layout of which will be confirmed at a later date.

6.3.2 GREEN OPEN SPACE

The three main categories of open space can be further broken down into seven distinct typologies.

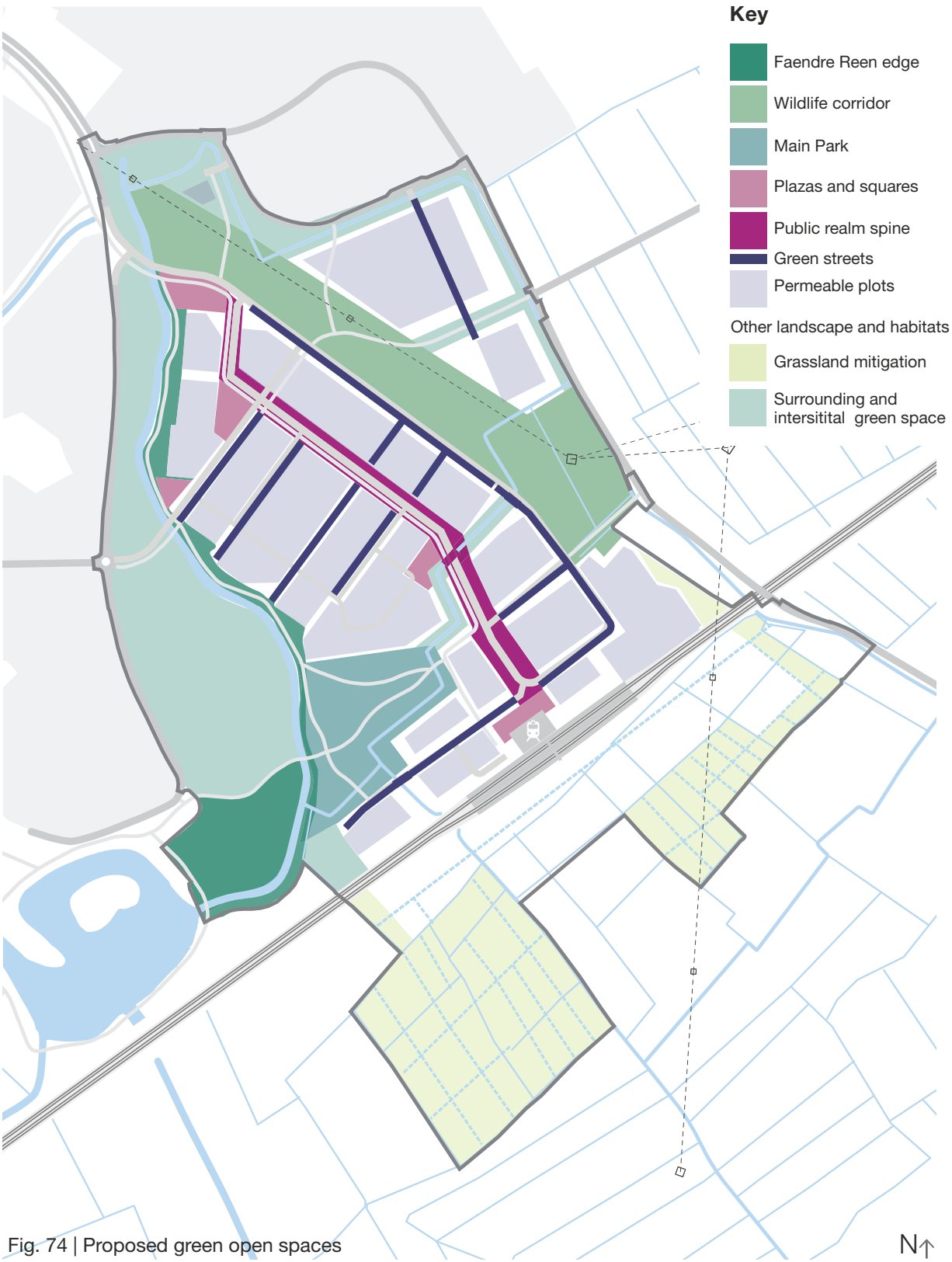
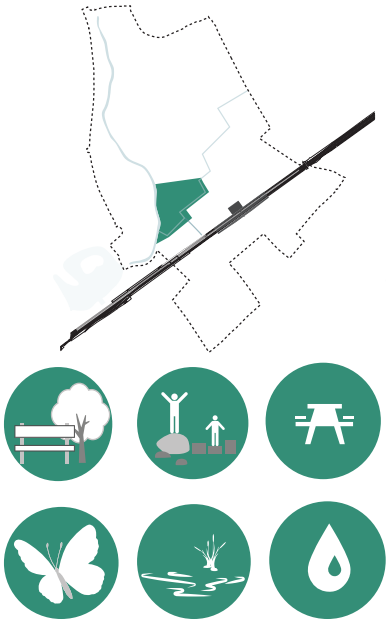


Fig. 74 | Proposed green open spaces

MAIN PARK

A cherished park framing the gateway to the Gwent Levels. The Park will be a dynamic landscape that promotes niche ecological profiles, water sensitive design solutions and an active community programme, ultimately becoming a much loved community asset.



For more details on the landscape programming and functions please see section 1.3.

Fig. 75 | Main Park / Ty Ffynnon Reen proposed section

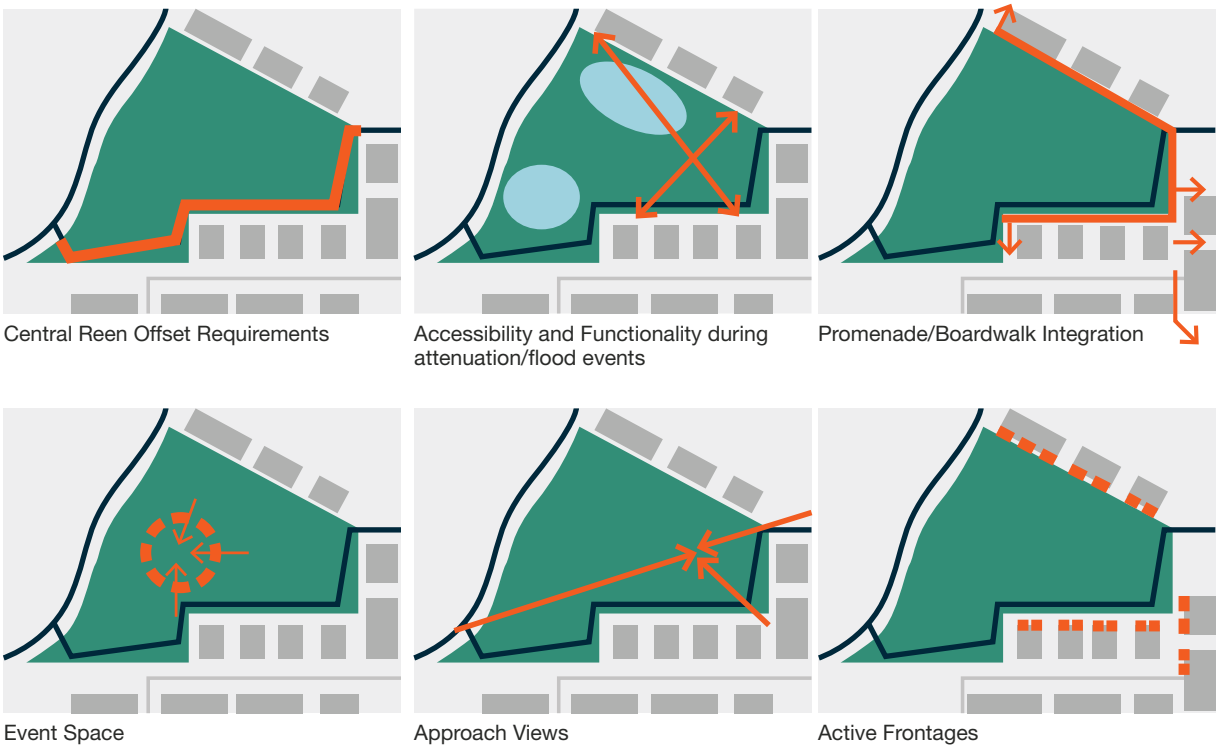


Fig. 77 | Main Park concept diagrams

Fig. 76 | A water sensitive landscape

Flexible event space

Meadow with mown paths, seating and play installations

Elevated Routes Over the Attenuation Landscape

Playful crossings

Event Space integrated with Landscape (example 65m diameter)

Fig. 78 | Landscape precedents

DYNAMIC ATTENUATION LANDSCAPE

A public realm including areas set aside for flood water storage will be created at Main Park. Surface water run-off from the surrounding buildings and promenade will be attenuated in the lower areas of the park, creating variable water levels whilst retaining function during exceedence events.

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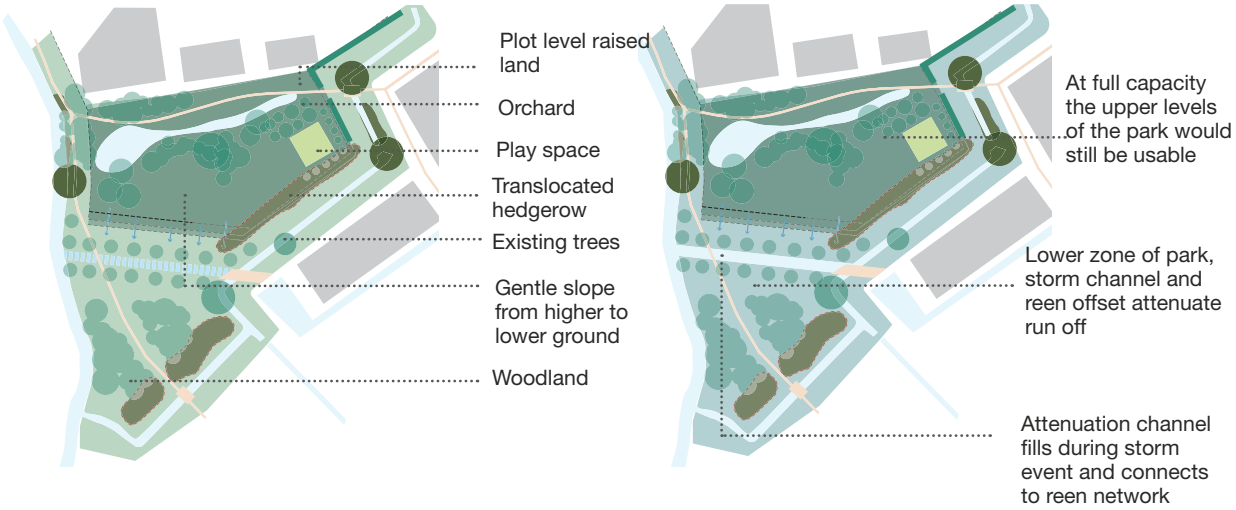


FAENDRE REEN EDGE

Faendre reen edge is the natural buffer to the west side of the site. A new footpath will be created along the edge, allowing people to walk the full perimeter, close to nature, and creating an extended walk to Hendre Lake. Three new crossing points will be created over the reen, connecting St Mellons through the wooded land to the west. Pedestrian and cycle routes from Cypress Drive to the station will be greatly enhanced by creation of these access points.

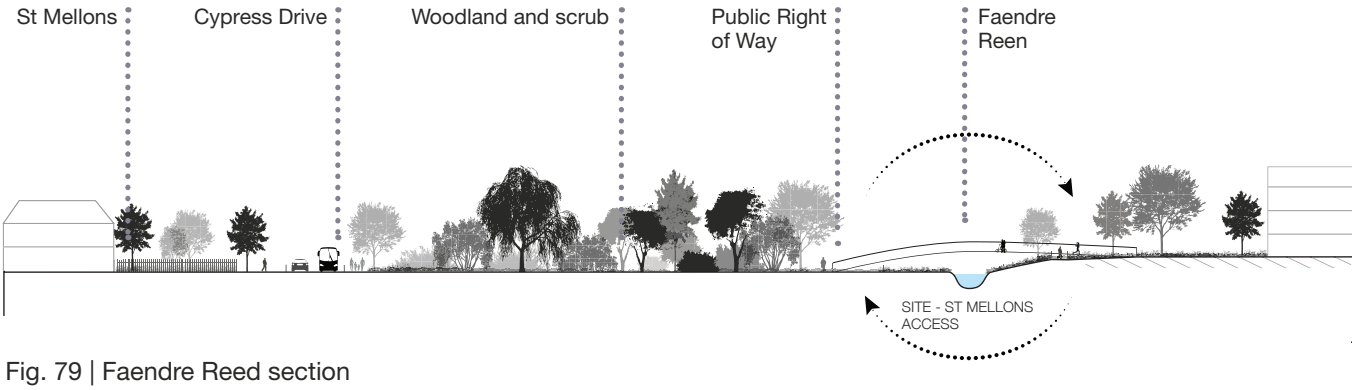
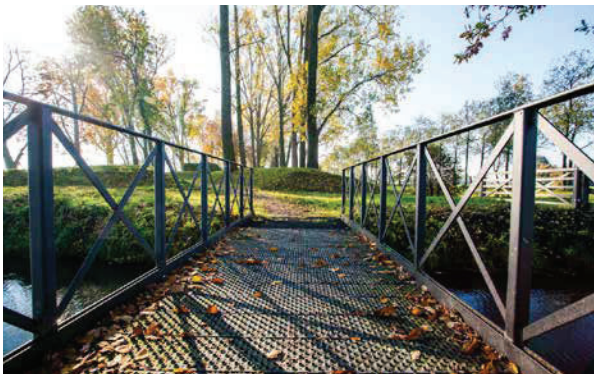


Fig. 79 | Faendre Reed section

A Blue/Green Landscape Character



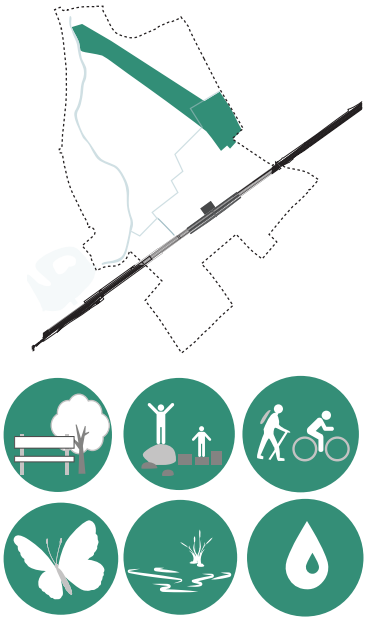
Access across reen to the wider natural area

Water channel integrated in the landscape

Fig. 80 | Landscape Precedents

WILDLIFE CORRIDOR

The wildlife corridor runs along the east side of the site, providing an ecologically rich buffer to the development zone. This area will be abundant with new habitats created for dormice: a continuous canopy of trees and shrubs of specific species including the staple Hazel. Part of this area will hold ground level water attenuation and trees will be planted such as willow and alder that are suitable for wet woodland. A public footpath runs across the corridor allowing a scenic route to and from site.



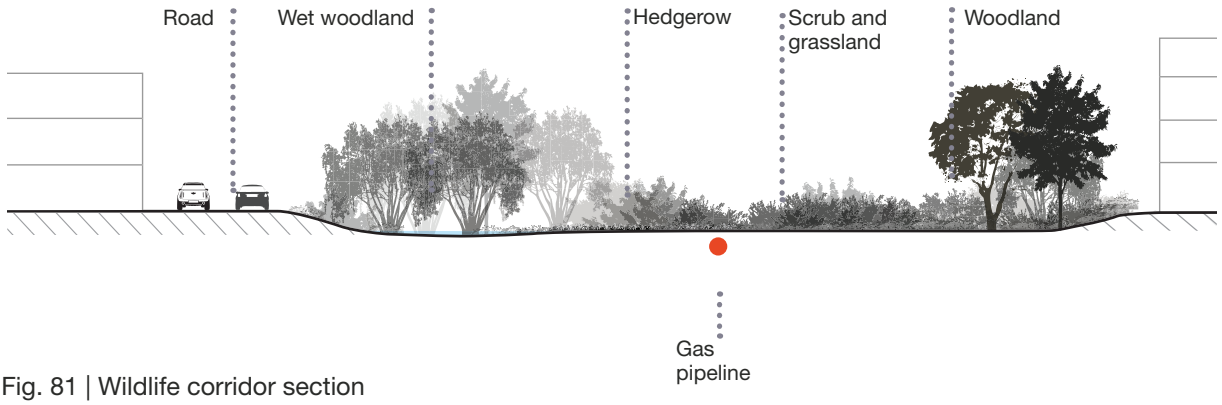


Fig. 81 | Wildlife corridor section

Management of the area close to the electricity pylons

Attenuating wet woodland

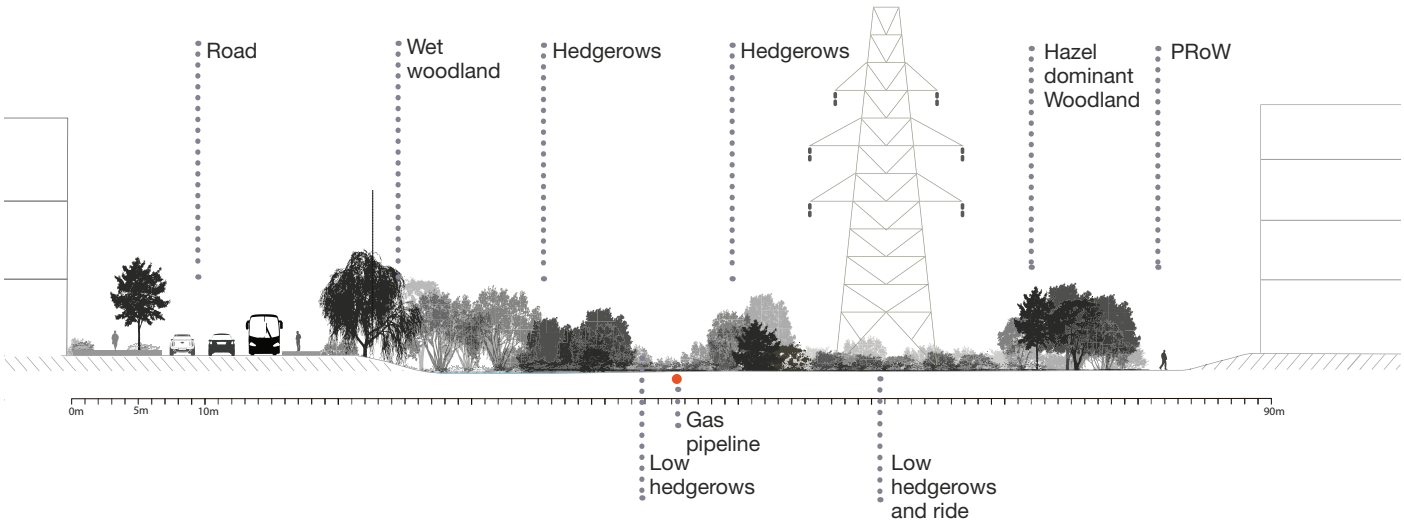
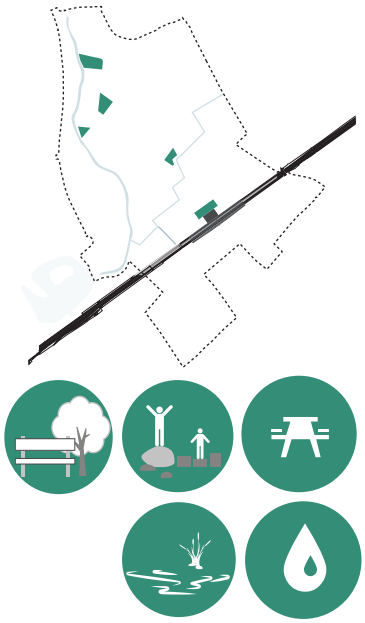


Fig. 82 | Wildlife corridor section with overhead lines

6.3.3 SQUARES AND PLAZAS



STATION SQUARE

The station square will be a significant civic plaza and public realm forming the gateway to the Gwent Levels, with integrated environmental design solutions to reinforce the sustainability and ecological profile of the new district. The Station Square will be alive with verdant planting and the sounds of water to welcome people and encourage them to explore the area or simply sit back and relax in the peaceful setting.

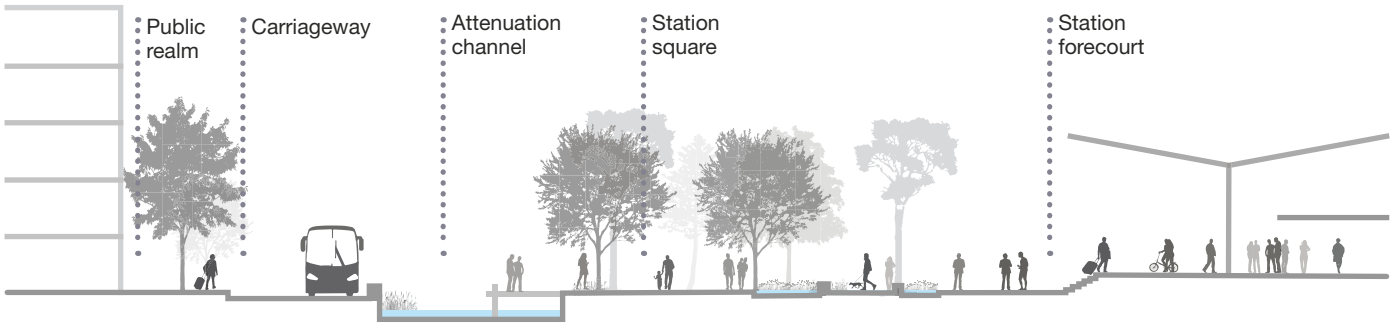
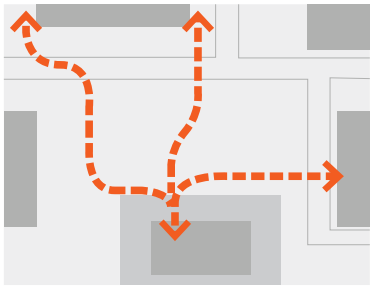


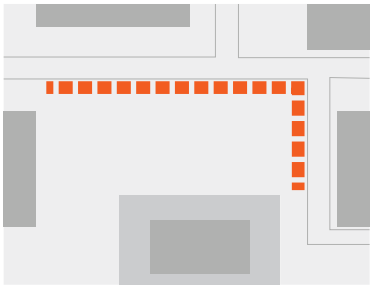
Fig. 83 | Station Square section

KEY CONSIDERATIONS

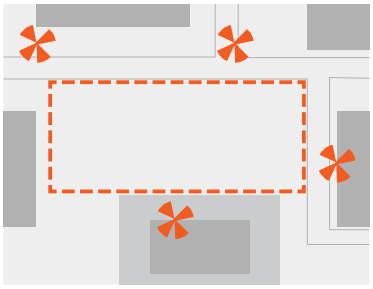
The following design factors have been considered in the station square



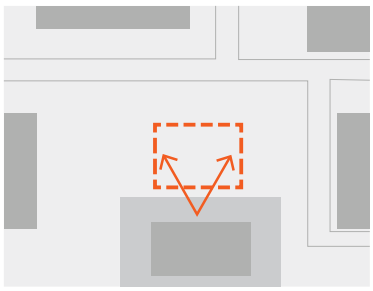
Pedestrian Flow and Connectivity



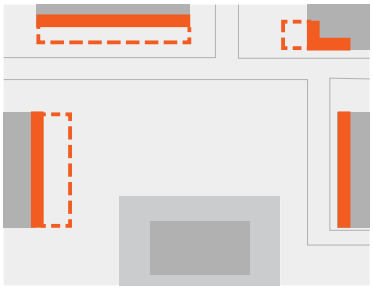
Vehicular Barriers



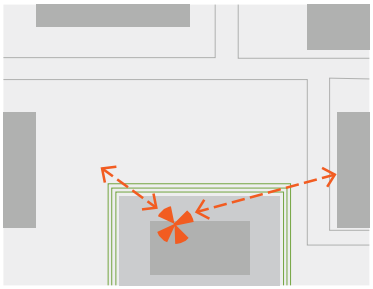
Arrival and first Impression



Flexible Event/Queueing Space



Active Frontages

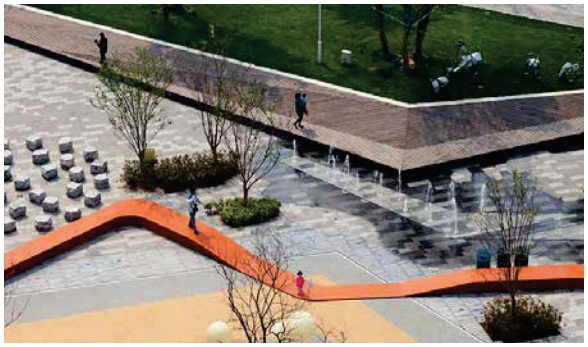


Inclusive Access

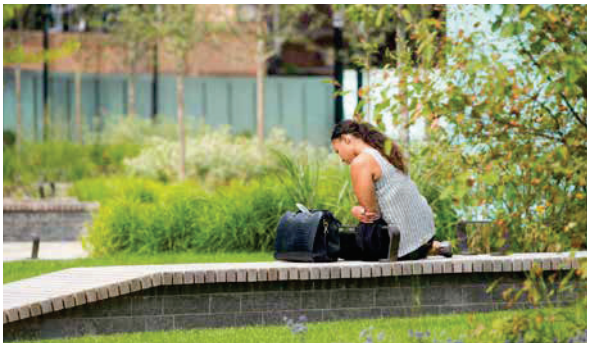
Fig. 84 | Station Square concept diagrams

Alive with green/blue elements defining the character

Water adding a calm element to the square



A dynamic space with interacting elements

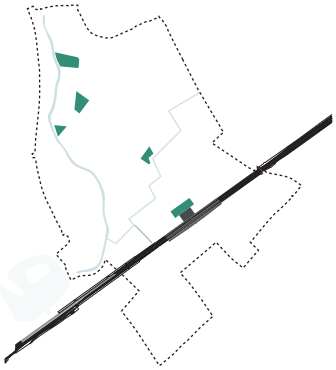


Seats and edges for people to rest and socialise

Fig. 85 | Public realm precedents

PUBLIC SPACES

Further public squares and pocket parks will be distributed through the site. They will vary in character, each offering a distinct sense of place. These plazas and parks offer opportunities for gathering, play and connection with nature.



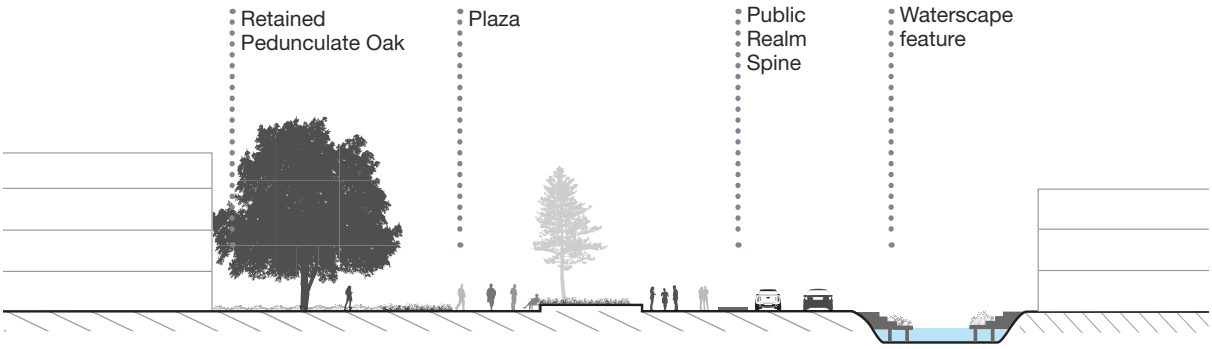


Fig. 86 | Public Space section

Raised plinths and seating areas

Trees and shelter

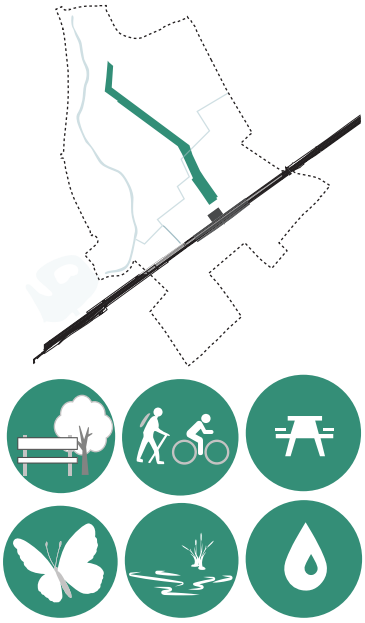
Dynamic rainwater features

Rain gardens integrated into plaza

Fig. 87 | Public realm precedents

PUBLIC REALM SPINE

The public realm spine is at the core of the development. Running north to south, it is a continuous multi-modal route, accessible to vehicles, pedestrians and cycles. The route has blue and green infrastructure at its heart. A water feature runs along the length of the route which has been integrated with the drainage strategy, providing opportunities to dwell, rest and meet. Densely planted with trees and other vegetation it will exemplify the integration of nature, well-being and urban use that characterises this development.



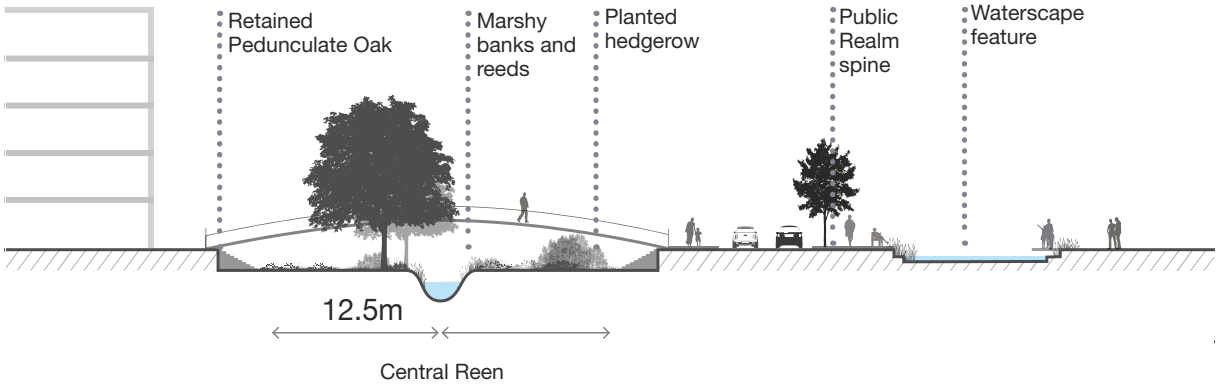


Fig. 88 | Public Realm Spine section

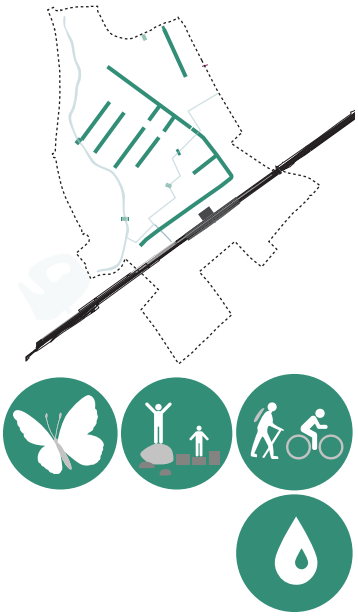
Crossing points within the waterscape

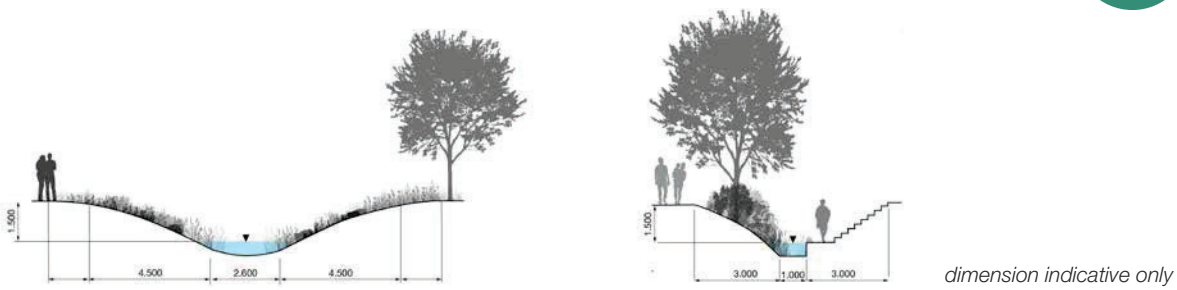
A shared multi modal route

Fig. 89 | Public realm precedents

GREEN STREETS

A network of streets will extend from the civic heart out towards surrounding natural areas. The streets will act as a living infrastructure featuring rain gardens, swales, tree planting and green frontages, making the streets a pleasant place to walk, encouraging active travel for those on site and the adjoining community of St Mellons, whilst contributing to green connectivity and the microclimate.





dimension indicative only

Fig. 90 | Cross-sections showing examples of water attenuation features along the green streets

Multi use spaces that attenuate water

Bringing an understanding of water management to the community

Fig. 91 | Public realm precedents

GREEN ROOFS AND LIVING FAÇADES

Green roofs and living façades will be encouraged on each plot. Blue roofs will be considered as part of the site's innovative use of water. Building surfaces have the opportunity to support and connect wildlife, process rainwater, mitigate temperatures and air pollution and create inspiring urban environments that change with the seasons. Green roofs could also create valuable recreational open space affording outstanding views across the Gwent Levels.

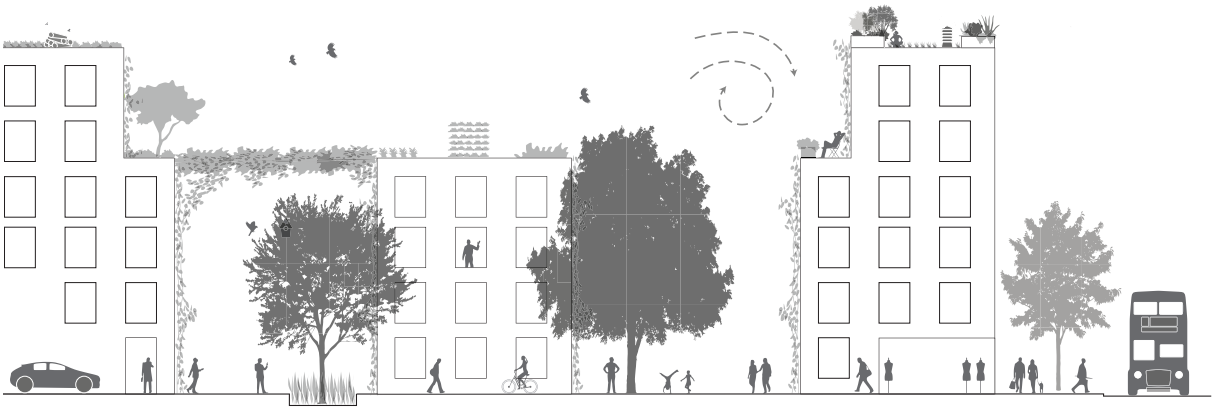
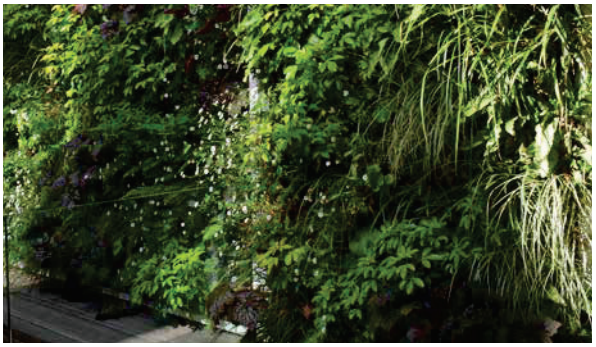


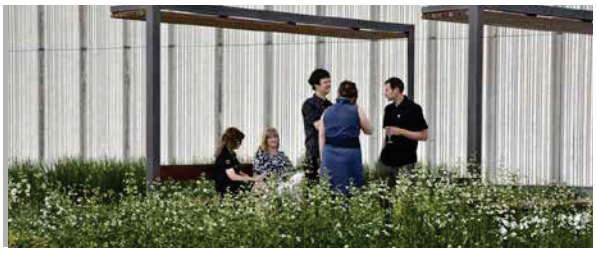
Fig. 92 | Green roofs and living façades concept diagram

Green roofs on bike shelters



Living walls and façades

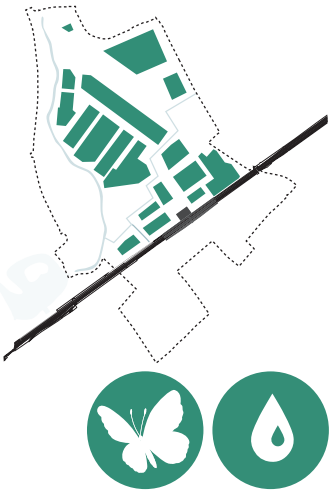
Capitalising on the views from roof level



Meeting spaces for workers

Fig. 93 | Public realm precedents

6.3.4 PERMEABLE PLOTS



PERMEABLE AND PLANTED CAR PARKING

Car parking plots will feature vegetated swales and a high proportion of planting amongst the bays.

There is potential for parking plots to have a transitional nature. Plots reserved for parking use in the near future can be designed to have a meanwhile use: serving as tree nurseries for the site for example. Parking spaces can be freed up over time and trees can be relocated on site.

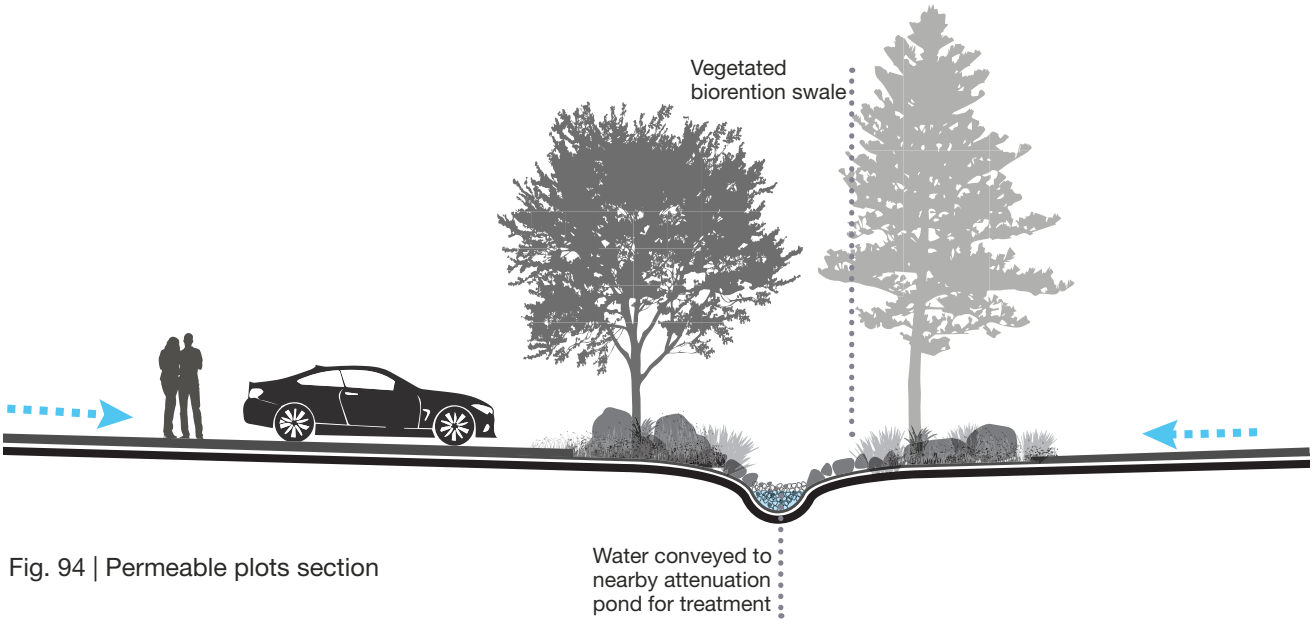


Fig. 94 | Permeable plots section

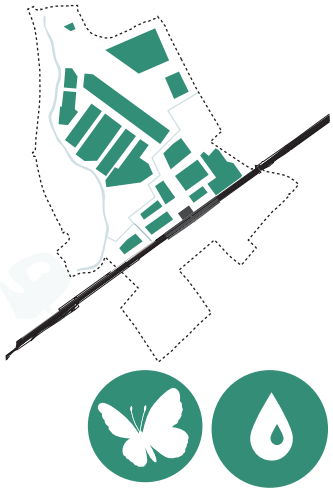
Making a feature of surface drainage

Vegetated bays

Fig. 95 | Permeable plots precedents

MICRO HABITAT CONNECTIVITY

The smallest and least accessible of spaces can contain valuable micro habitats. Throughout the site such habitats will be created. These will include bat and bird nesting boxes, insect hotels, and extensive (brown) roofs which can provide for invertebrates. Log piles, bird perches and areas allowing for natural plant colonisation and succession will be encouraged. Ecology surveys have show evidence of nesting Barn owls and various bat species in the area so efforts will be made to support their continued presence.



Log piles for invertebrates

Barn owl

Insect hotels

Integrated nesting holes

Fig. 96 | Species and habitats

6.4 Landscape Materials

6.4.1 LANDSCAPE CHARACTER AREAS

The site can be largely divided into three planting character areas, which align to the levels of management and maintenance that each will require.

Fig. 97 | Landscape character areas

1. NATURAL: TREES, HEDGEROW, GRASSLAND

The strategy for the natural areas is for biodiversity net gain. The character of each area will be specific to each type of habitat that is being enhanced and management of them will be principally for ecological functionality. Though these areas will not be fully accessible, routes will pass through them. They will offer a sense of nature and refuge, whilst being easily reached from the urban centre.

Fig. 98 | Hawthorn hedging

2. CIVIC: PARKS, SQUARES, COMMUNITY SPINE

The civic realm planting will be designed to create spaces of character and high aesthetic value to promote well-being to employees and users of the space. Key areas of the public realm will be framed and defined by the planting of standard and semi-mature trees, providing a cohesive sense of place from the outset. Amenity, biodiversity and urban resilience will also contribute to plant choices.

Fig. 99 | Dawn Redwoods lining a street in Autumn

3. PLOTS (PERMEABLE AND CONNECTIVE)

Roadside wildflower strips, rain gardens and swales, permeable paving, multi-use parking areas, extensive roofs, living walls, micro habitats and biodiverse native tree planting will be encouraged across the site. Plots that function as living infrastructure will enhance wildlife and connect the site to the surrounding countryside.

Fig. 100 | Wildflowers on roadside verges

6.4.2 PLANTING STRATEGY: NATURAL OPEN SPACE, TREES

EXISTING

The existing site has a predominance of two different groupings of tree species. The first is that of seasonal wet woodland: Goat Willow, Crack Willow and Alder. These are found mainly to the immediate south of the railway line, and close to reen edges.

To the west site boundary between Cypress Drive and Faendre Reen, there is a looser wooded and scrub grouping of Pedunculate Oak, Ash, Alder, Birch, Poplar, Field Maples and Willows.

Seasonal wet woodland in the south of the site

RETAINED

Following an arboricultural survey, trees were categorised according to British Standard 5837 (see below). Most of the trees on site were identified as category B, with the next highest group being category C. Existing tree locations and types have been considered through masterplan develpoment and 50% of category B trees are retained, while 65-70% of category C trees are retained. Various scrubby groups of trees, (assessed separately) have also been retained, especially along the Ty Ffynnon reen corridor though the centre of the site.

Native tree planting and retention is key to the site's long term biodiversity enhancement goals. Tree planting will be undertaken with existing wildlife such as Barn Owls and bats in mind to, for example, provide the sightlines that these species travel by.

Individual Oak tree in the north of the site

Fig. 101 | Existing trees on the site

BRITISH STANDARD 5837

Category A: High Quality
Trees or groups whose retention should be given a particularly high priority within the design process. Normally with an expected useful life expectancy of at least 40 years.

Category B: Moderate Quality
Trees or groups of some importance with a likely useful life expectancy in excess of 20 years. Their retention would be highly desirable; selective removal of certain individuals may be acceptable, but only after full consideration of all alternative courses of action.

Category C: Minor Value
Trees or groups of rather low quality, although potentially capable of retention for at least approx. 10 years. Also small trees with stems below 15cm diameter.

Category U: Unsuitable
Trees likely to prove to be unsuitable for retention for longer than 10 years should any significant increase in site usage arise as a result of development.

PROPOSED

The site allows for a wide diversity of tree species to be planted: Those adapted to urban areas, open parkland and woods. There is space for large feature trees to be placed in key locations and through the urban realm to give seasonal interest, and create character.

In order to encourage biodiversity, native trees and those already seen on site will be used as much as possible, especially in the wildlife corridor. Species characteristic of wet woodland and specifically known for dormouse habitats will form the focus for planting in the wildlife corridor. In the natural areas whips and transplants will be planted, to ensure successful establishment.

The diagrams below demonstrate the areas that replacement trees will be planted (reserved to certain areas for mitigation) and the context of existing trees to be retained and removed.

Significant numbers of additional trees will be planted on streets throughout the development site, leading to a net gain in tree numbers.

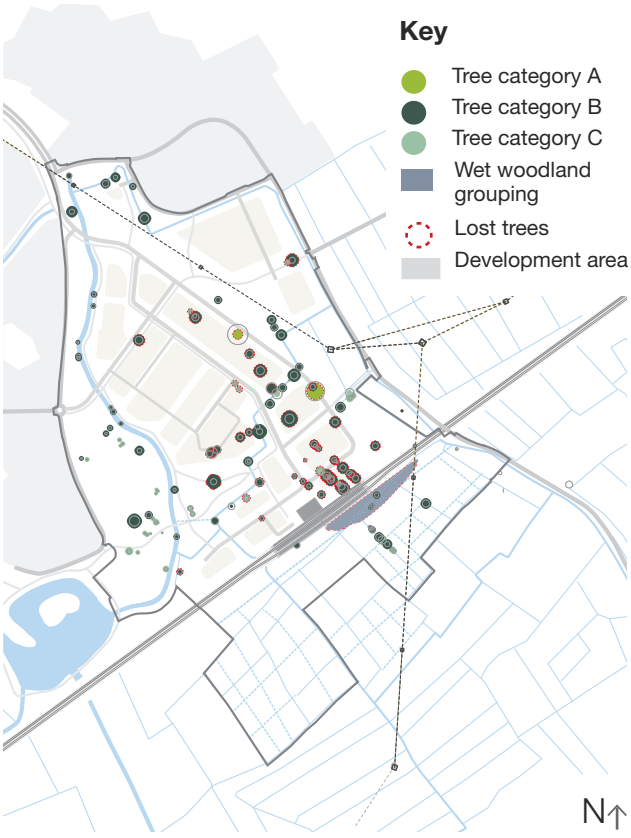


Fig. 102 | Retained and removed trees

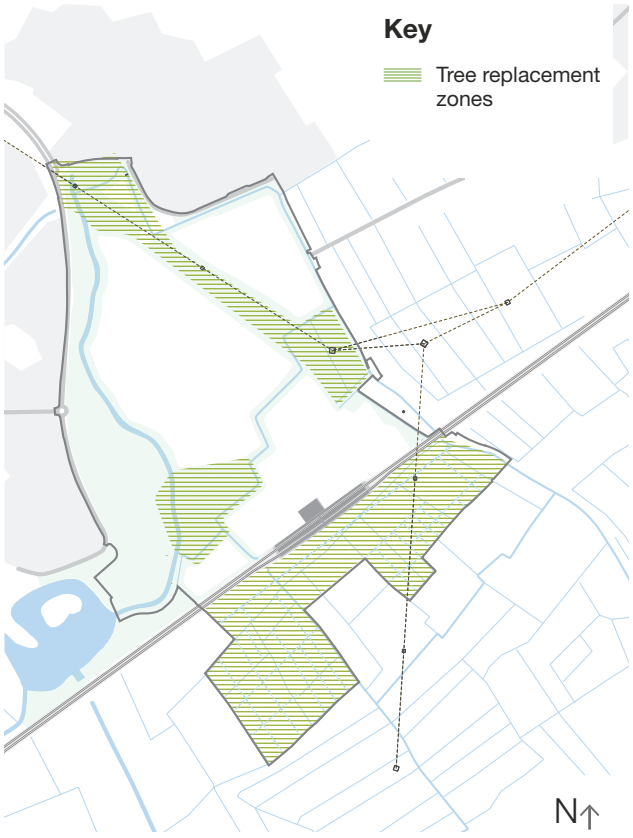


Fig. 103 | Tree replacement areas

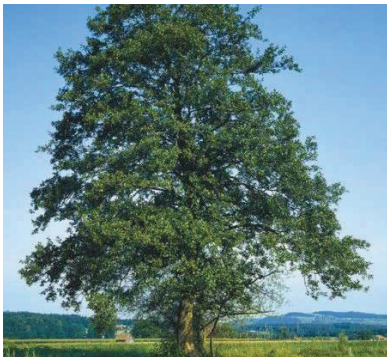
PROPOSED TREE SPECIES

Native woodland will be planted with mixed species in appropriate combinations from those indicative species shown to the right. Though an aim will be on planting long lived species, shorter lived species such as birch and poplar will be important in woodland establishment.

The table below highlights the main factors for consideration in selecting appropriate species for planting on site in different areas.

Consideration	Principle
Existing character	Use of native trees Replace with same and similar species
Biodiversity and ecology	Supporting mammals and birds Supporting pollinators and insects Consideration of tree network
Urban resilience	Tolerant of paving Drought tolerant Short term flood tolerant Resistant to pest and disease Resistant to pollution
Specific characteristics	Wet woodland Dormouse specific species
Aesthetics and character	Age/size of tree and location Statement trees Seasonal interest Long lived trees Mix of deciduous and evergreen
Recreation	Edible Shade providing
Maintenance	Maintenance requirements

Wet woodland and reen edge



Alnus glutinosa
Common Alder

Salix caprea
Goat Willow

Salix fragilis
Crack Willow

Salix alba
White willow

Longer lived species
(Over 350 years)

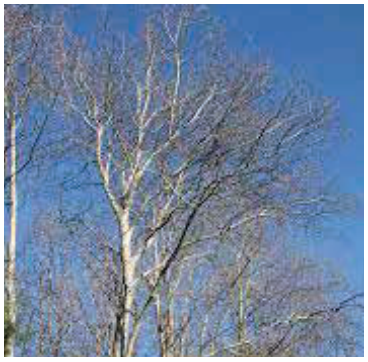
Quercus robur
Pedunculate Oak

Acer campestre
Field Maple

Medium lived species
(Up to 350 years)

Carpinus betulus
Hornbeam

Short lived species
(Under 100 years)

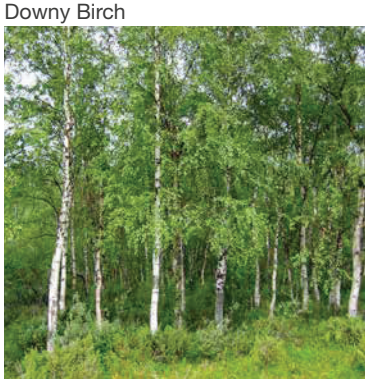


Populus tremula
Aspen

Betula pubescens
Downy Birch

Salix Bablylonica 'pendula'
Weeping willow

Populus alba
Poplar



Betula pendula
Silver Birch

Fig. 104 | Indicative proposed species

6.4.3 PLANTING STRATEGY: NATURAL OPEN SPACE, HEDGEROWS

Hedgerow species are a strong characteristic of the site. They feature as unmanaged scrub amongst the loose woodland to the west of the site, and more formally as edges to the reens. Prominent species are Hawthorn and Blackthorn with dominance of Willow close to the reen edges.

EXISTING, RETAINED AND PROPOSED

Arboricultural and ecological surveys have assessed the hedgerows and shrub groupings on site.

Most surveyed hedges were given a C classification (Minor Value). Many were dense with prolific bramble. The average width of the most notable hedges is 5m and the height, 3m. New hedges will be planted with an appropriate mix of species to encourage wildlife habitation and to limit over dominance of any particular species. Many of the hedge species in the natural areas can also feature in the more managed civic areas as small trees, such as Hawthorn, providing connective wildlife spaces and continuity of character.

The table below outlines the quality of the native hedging on site and how much of each grade will be retained or lost. The amount of proposed rich intact hedging vastly outweighs what is lost.

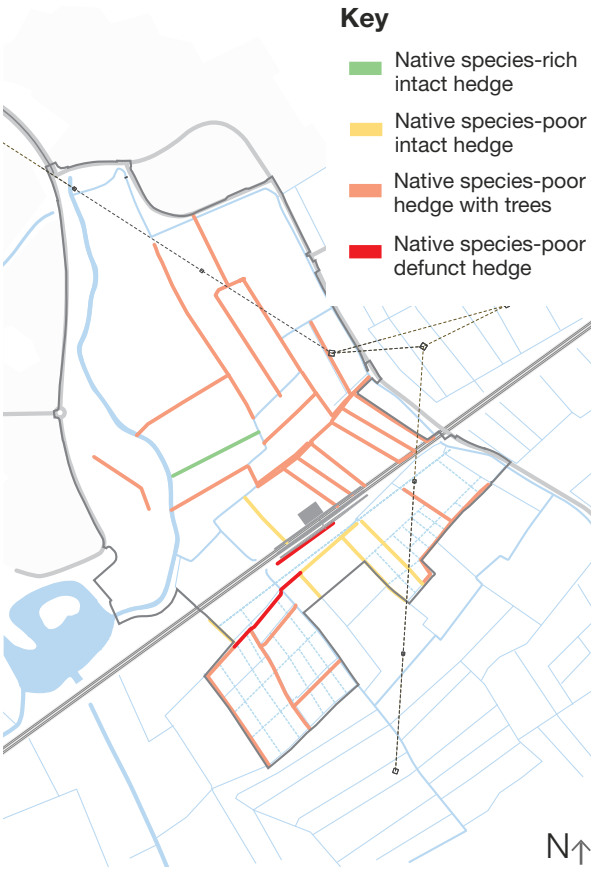


Fig. 105 | Existing hedgerows

Hedgerows (m)

	Baseline	Retained	Lost	Proposed
Native species-rich intact hedge	225	15	210	4,765
Native species-poor intact hedge	933	788	162	0
Native species-poor defunct hedge	394	233	161	0
Native species-poor hedge with trees	5,342	2,301	3,041	0
Total	6,894	3,337	3,574	4,765

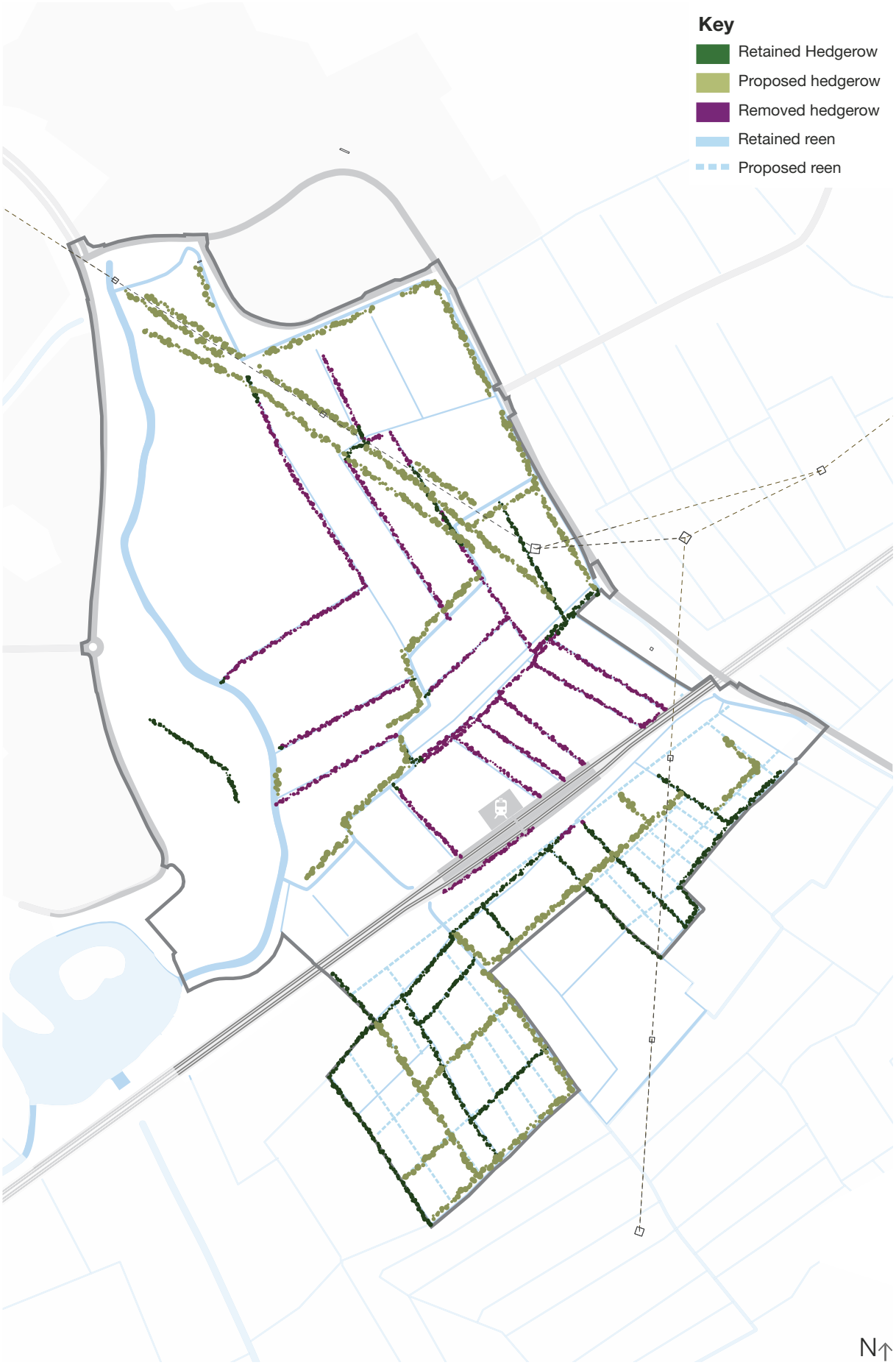


Fig. 106 | Hedgerows retained, removed and proposed

Salix caprea
Goat willow

Sambucus nigra
Elder

Prunus padus
Bird cherry

Prunus spinosa
Blackthorn

Crataegus monogyna
Hawthorn

Cytisus scoparis
Broom

Fig. 107 | Indicative proposed hedgerow species

DORMOUSE HABITATS

Certain species are key to dormouse habitats, and they will be planted in the wildlife corridor. It is important that dormice have the right mix of continuous trees and shrubs so that they can remain above the ground with a source of food. A specific mix of large to small trees, shrubs and climbers has been identified to plant in order to create a habitable environment for them. These include Bramble, Hazel, Yew, Broom and Hawthorn.

Corylus avellana
Hazel

Rubus fruticosa
Bramble

Muscardinus avellanarius
Hazel Dormouse

Fig. 108 | Key species for Dormouse habitats

The site has notable grassland which is habitat to a variety of important species. As part of the vegetation strategy, this grassland will be replaced at a minimum ratio of 1:1. Wherever possible, existing grassland will be enhanced to further encourage the specific species which are unique to this habitat. During operations, topsoil will be retained where possible in order to utilise the existing seed bank and invertebrate community for relocation.

The Gwent Levels are home to a nationally important colony of Waxcap fungi which are under threat. The tiny Shrill Carder Bee was once common in the UK, but is now restricted to a few specific sites including the Gwent Levels. It is important for pollination of the grassland species specific to the pasture there. Continued grazing of the land can help to maintain floristic and other diversity. Species with long corolla (petal arrangement) such as Red Bartisia, Red Clover and Knappweed are particularly important for them.

As grassland is such an important characteristic of the site, amenity areas such as road verges will also be planted with native wild flowers, increasing connectivity, sense of place and context.

Anacamptis morio
Green Winged Orchid

Silaum silaus
Pepper Saxifrage

Trifolium pratense
Red Clover

Centaurea
Knappweed

Lotus corniculatus
Birdsfoot Trefoil

Odontites vernus
Red Bartisia

Festuca ovina
Sheep Fescue

Stachys officinalis
Stachys

Fig. 109 | Indicative proposed grassland species

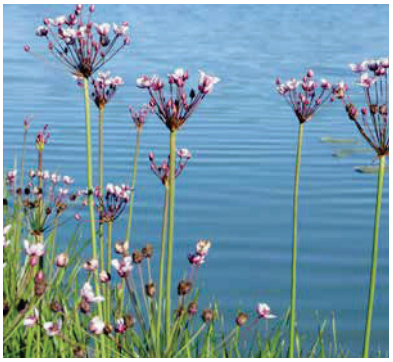
Bombus sylvarum
Shrill Carder Bee

Camarophyllopsis micacea
Yellow stemmed waxcap

Hygrocybe chlorophana
Golden Waxcap

GRAZING MARSH

The lower levels of field systems on site have more of a marsh typology, with summer grazing ensuring a flower rich community. Unusual species such as the Flowering Rush are specific to this area of the Wentloog Levels.



Butomus umbellatus
Flowering Rush

Lychnis flos-cuculi
Ragged Robin

REEN EDGES

In order to protect and encourage watervole habitation, it is important to provide an undisturbed bank and a 1-2m edge of vegetation for refuge. It is important though for both watervoles and other species that the reen edges are not overshadowed or shaded, so they need to be managed accordingly. In addition to mammals the reens are home to nationally scarce vegetation types, including Wolffia arrhiza, the smallest vascular plant on earth.

Arvicola amphibius
Water vole

Wolffia arrhiza
Rootless Duckweed

Phragmites
Common Reed

Lutrinae
Otter

Fig. 110 | Indicative proposed reen edge species

6.4.4 PLANTING STRATEGY: CIVIC OPEN SPACE

A mixture of native and ornamental planting will be considered in order to ensure seasonal interest and biodiversity through the squares, along the community spines and on connecting streets. Indicative mixes would include, grasses, a perennial herbaceous layer, a shrub understory and high canopy trees. Street trees will provide shade, mitigate air pollution, and integrate the development with its surroundings. A hierarchy of tree size relating to street scale and proportions will be applied for legibility. Planting character will draw from the grassland, hedgerow and waterscape surroundings.

Street trees

Quercus palustris
Pin oak

Sorbus aria
Whitebeam

Betula pendula 'Youngii'
Young's Weeping Birch

Acer campestre 'Elsrijk'
Field maple

Betula pubescens
Downy Birch

Corylus colurna
Turkish Hazel

Fig. 111 | Indicative proposed civic tree species

Ground cover and planters

Asarum europaeum
Wild Ginger

Polystichum setiferum
Soft Shield Fern

Waterscape planting

Juncus effusus
Rush

Liriope muscari 'Monroe White'
White Lily Turf

Symphoricarpos albus
Snowberry

Iris pseudacorus
Flag Iris

Hakonechloa macra
Hakone Grass

Sambucus nigra
Black Elder

Carex pendula
Weeping sedge

Camassia Leichtlinii 'Alba'
Camassia

Allium ursinum
Wild Garlic

Carex eleata 'Aurea'
Bowles Golden Sedge

Fig. 112 | Indicative proposed civic planting species

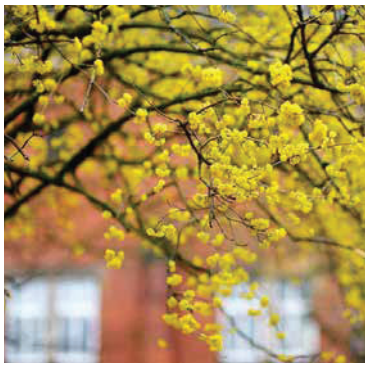
6.4.5 PLANTING STRATEGY: PERMEABLE PLOTS

The planting at plot level is important for ecological connectivity. This will include: Berry rich trees and shrubs, flowers attractive to pollinators, plants adapted to flood and drought for rain gardens and species for roofs and façades. On extensive roofs, a variety of growing medium depths (10-50cm) will allow for a range of plant options.

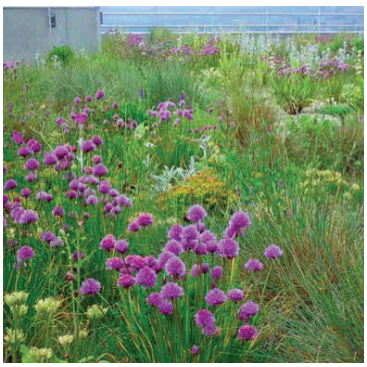
Sedum type extensive green roof (thin substrate)

Wildlife supporting

Cratageus laevigata 'Plena'
Hawthorn 'Plena'



Cornus mas
Cornelian Cherry



Steppe type extensive green roof (medium substrate)

Euonymus europaeus
Spindle

Malus sylvestris
Crab Apple

Vertical climbers

Euonymus europaeus
Spindle

Cytisus scoparia
Broom

Wildflower mixes

Fig. 113 | Indicative proposed permeable plot species

Rain gardens and swales

Lobelia siphilitica
Cardinal flower

Iris sibirica
Siberian Iris

Persicaria bistorta 'Superba'
Persicaria Superba

Carex stricta
Tussock sedge

Stachys byzantina
Lambs Ear

Lythrum salicaria
Purple Loostrife

Miscanthus sinensis 'Gracillimus'
Chinese Silver Grass

Alchemilla mollis
Lady's Mantle

Sambucus canadensis
Elder

Deschampsia cespitosa
Tufted Hair Grass

Rosa rugosa
Japanese rose

Amelanchier 'Robin Hill'

6.4.6 MATERIALS

Natural

HARDSCAPE

The hard materials and surface finishes selected will be integral to the character, quality and continuity of landscape design through the site. Consideration will be given to quality, sustainability, whole life cost, longevity, durability and ease of replacement. A cohesive palette of hard materials will provide legibility across the site and serve an essential role in connecting the hard and soft aspects of the development.

WAYFINDING

Effective wayfinding will encourage freedom of movement and ease of navigation. It will also play a role in connecting the site to the surrounding context. An integrated approach that avoids cluttering and works with a limited palette will complement the public realm and can be adapted to suit the character of different areas. Visual landmarks will play a role in wayfinding in both the civic and natural areas.

FURNITURE

Furniture will be designed and selected to enrich and enhance public spaces. High quality, durable materials will be proposed to ensure long term attractiveness and function. The approach will work with a design vocabulary that allows for consistency and legibility whilst allowing an informal and natural feel towards the outer edges and a more formal application at the heart of the public realm. Proposed furniture will also be dependent on whole life sustainability and ease of replacement with consideration given to where streets may need to be adoptable for Cardiff Council maintenance.

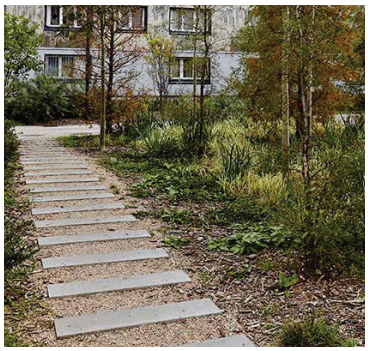
LEVELS AND CROSSINGS

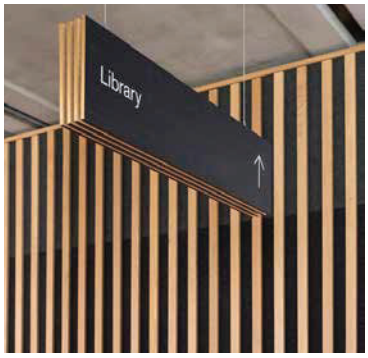
The level changes and reens provide opportunities for creative and delightful interactions across water and between environments for both movement and rest.

Natural

Civic

Plots





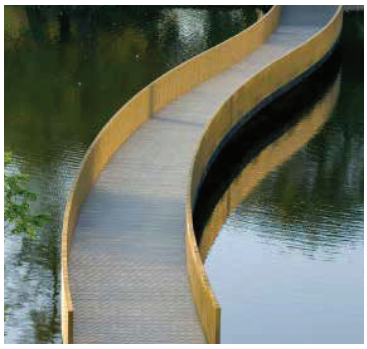


Fig. 114 | Indicative proposed landscape materials

6.4.7 LANDSCAPE MAINTENANCE PRINCIPLES

There are various ways of managing the open spaces, these are possible ways to consider based on use:

Area	Maintenance level required	Details	Management
Plots	High	Dependent on features at plot level but potentially high maintenance due to importance of appearance. Planting of suitable species and more natural style vegetation can reduce maintenance requirements. Streets will depend on whether or not they are adoptable by Cardiff Council. Long term plan to be put in place to ensure success of tree planting.	Contractors engaged by management company for the buildings. Certain buildings and features could be best managed at building occupant level. e.g. green roofs, living walls, atrium and facade landscapes.
Civic realm: business district and squares	High	As above, potentially high maintenance due to importance of appearance and accessibility. Planting of suitable species and more natural style vegetation can reduce maintenance requirements. Depends on whether adopted by Cardiff Council. Long term plan to be put in place to ensure success of tree planting. Contractors likely to need understanding of waterscapes and related planting.	Contractors engaged by management company for the development. Possibility of being adopted by Cardiff Council. Ideally same contractors across site to ensure consistency of care.
Main Park	High	As above, potentially high maintenance due to importance of appearance. Planting of suitable species and more natural style vegetation can reduce maintenance requirements. Depends on whether adopted by Cardiff Council. Long term plan to be put in place to ensure success of tree planting. Contractors likely to need understanding of waterscapes and related planting	Contractors engaged by management company for the development. Possibility of being adopted by Cardiff Council. Ideally same contractors across site to ensure consistency of care.

Area	Maintenance level required	Details	Management
Faendre Reen	Low - medium where there is public access	Reen edges must be managed to not overshadow the water. Cut alternate banks each year to leave watervole refuge. Do not cut too short and carry out late in summer after breeding season. Twice yearly monitoring and removal of invasive species from watercourse. If willows are coppiced, no cutting March - August during bird nesting season.	NRA and NRW managing the cutting. Coordination with contractor looking after civic realm
South Reens area	Low		NRA and NRW managing the cutting or NRA and farmers managing the grazing
SINC replaced grassland	Low	Rotating cattle grazing to keep grass levels low and allow wildflowers to dominate. Alternatively 1-2 yearly cuts with the main one in late summer after seed has set. No enrichment of soil or application of herbicides/pesticides.	NRW managing the cutting and/or Farmers managing the grazing
Wildlife Corridor	Low	Continuity of arboreal cover to be maintained. Breaks in hedge to be replaced. New plantings to be monitored until established. Create coppiced blocks with 5 -20 year coppicing cycle of shrubs and some trees. No operations March - end August (breeding and nesting time). Fell in small non adjacent blocks. Small scale felling every 4 years (max 10%) to keep canopy openings for varied species mix. Rides and glades to be mowed once a year and their edges cut on a 2 yearly cycle. Retain bramble, climbers and dead wood. Create log piles.	NRW / contractors affiliated to a wildlife conservation or forestry body.

6.5 Lighting

Urban lighting is an important feature in large development projects. Its function is to help enhance the public spaces within towns and cities, to create a safe environment with a character appropriate to its use.

Lighting also impacts the visual hierarchy of a development by creating visual cues to direct users' attention into and around the space. The masterplan will reinforce the hierarchy of spaces and routes after dark through a carefully considered lighting strategy.

This section highlights the approach to lighting in the proposed development at nighttime. This includes:

- Lighting hierarchy and character;
- Site access, movement and safety;
- Light pollution and lighting control opportunities; and
- Ecological sensitivity.

LIGHTING HIERARCHY AND CHARACTER

The lighting character of the masterplan will vary across the site to create a visually stimulating environment which helps to retain vibrancy and life in the development in the evening and nighttime.

A warm white colour temperature of light is recommended throughout the site. This choice complements the various activities and functions of each area of the development.

Variation in lighting will help to identify the character and function of each character area to help create a visual journey through the site. While each area is different, the aesthetics should work seamlessly together.

A lighting hierarchy will be applied, setting out variation of brightness, colour and lighting techniques across the site. This will include identifying the following key lighting character areas:

The Station and Station Square: An urban environment where light levels will be higher to promote safety and create a vibrant evening environment. Lighting will form an integral part of buildings, public realm and art.

Public Realm Spine: Lighting will aid site legibility, with distinctive lighting techniques helping to identify key public space and nodal points within the development.

Waterways and Habitats: The illuminance levels will drop around watercourses and interfaces with habitat areas to account for the ecological sensitivity. Low-level lighting will be used where pathways pass through these areas, or where other public access is supported.

Station and Station Square

Public Realm Spine

Waterways and habitats

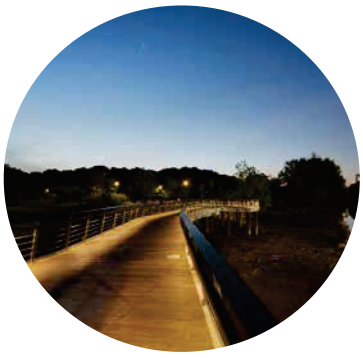


Fig. 115 | Indicative proposed approach to lighting

MOVEMENT, ACCESS AND SAFETY

The site will be suitably lit to support public access and ensure safety for people within their surrounding environment. This will include:

- Key areas of the development and public realm;
- Footpaths and cycle ways;
- Access roads;
- Station park & ride areas; and
- The railway station, interchange and surrounds.

A hierarchical approach will be taken to ensure that the busiest locations and routes, which are most likely to be used during the night, are appropriately lit. These areas may need brighter illumination at nighttime to improve safety, aid wayfinding, encourage people to dwell and create a nighttime economy.

Lighting will be arranged to accord with the developments street hierarchy to help site legibility and make it easier for visitors to find their way around.

Fig. 116 | Controlled and uncontrolled lighting impact

Uncontrolled lighting

LIGHT POLLUTION AND LIGHTING CONTROL

Obtrusive light is a form of light pollution. It is the result of unwanted light cast outside the intended area, which results in a waste in energy and can also lead to affecting surrounding areas including animal habitats. This can include:

- direct upward light;
- light spill; and
- light trespass.

Direct upward light occurs when the light strays above the luminaire's horizontal plane, which leads to sky glow.

Light spill and light trespass occur when light falls outside the area intended for illumination, for example - lighting through windows into a property.

The Hendre Lakes masterplan has been categorised as 'E3', medium district brightness. This category has been established using ILP GN01: 2011 - Guidance Notes for the Reduction of Obtrusive Light.

It is essential to use lighting only where necessary and at the appropriate illumination level. The impact of obtrusive light can be managed in the following ways:

Curfew: Curfew periods aim to reduce illuminance levels during periods when less light is needed. Generally, this would be late at night and in the early hours of the day when footfall is minimal. A typical curfew period is from 11pm to 6am.

Control System: A method of controlling the external lighting such as dimming brightness or switching off lights via an astronomical timeclock.

Optical control: Careful specification of luminaires will help create the desired effect whilst controlling the lighting distribution. For example, some column-mounted fittings have back spill optics which minimise the backward spread of light and control the forward throw of the light beam.

Position and orientation: The position and orientation of luminaires is critical to prevent unwanted light spill and glare. Placing luminaires too closely to buildings or structures could create light trespass or unwanted highlights to surfaces. The locations of buildings, roadways, pedestrian and vehicular access will dictate the specific lighting approach and the lighting positions.

Controlled lighting

RESPONDING TO ECOLOGY

Lighting within the development will be carefully tailored to avoid impact on areas with ecology sensitivity. The control, location and character of the light will play a pivotal role in creating a harmonious relationship with the existing ecology.

The ecological survey has identified at least seven species of bat on the site.

It is recommended to introduce dark or low-light areas surrounding the development to help protect light-sensitive species. Softer lighting on recreational footpaths in habitat areas will also help to create an attractive experience for walkers.

Areas of the public realm that intersect or interface with habitat areas, including where streets cross primary reen, will include low level lighting and appropriate lighting mitigation measures.

Where possible, low-level lighting will be used to keep the illumination isolated and focussed without light straying from the development into surrounding areas. This technique should be used while maintaining suitable amounts of light for pedestrians to see their route clearly and to identify others.

Examples of low-level lighting, include:

- Bollard lighting;
- Handrail lighting;
- Lighting integrated into furniture; and
- Floor marker lights.

Opportunities for various lighting techniques and their implementation can be discussed as the design develops.

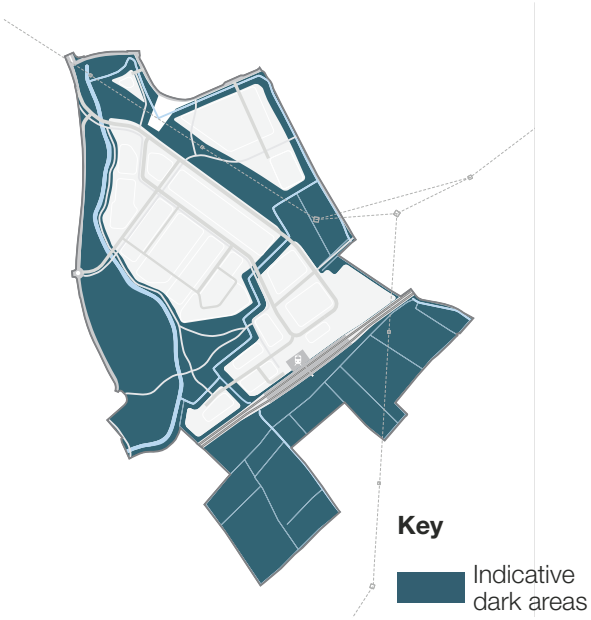


Fig. 117 | Indicative dark areas

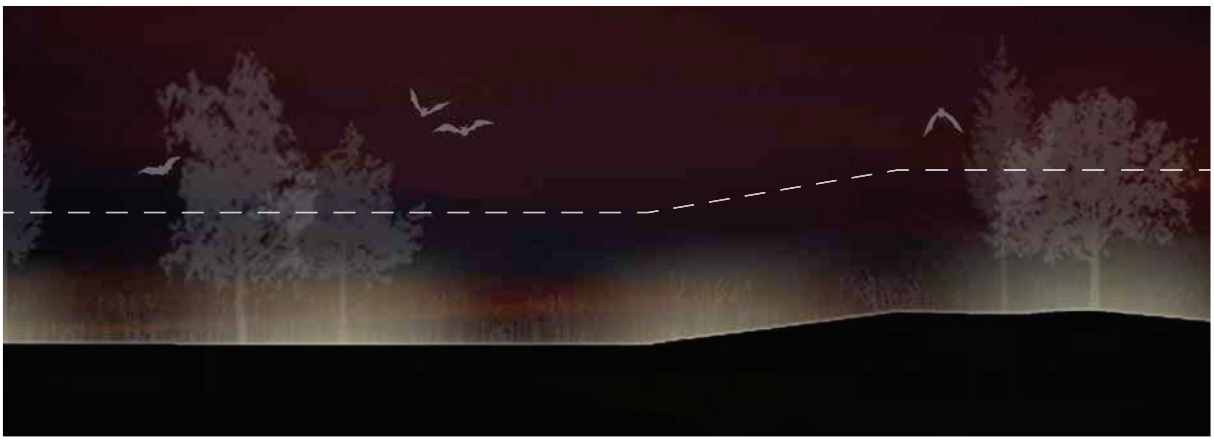


Fig. 118 | Illustration of sensitive and low-level lighting

6.6 Community safety

Eyes on the street: By ensuring that public spaces (streets, parks etc.) are directly overlooked by occupied buildings with clear lines of sight is a critical factor in deterring anti-social behaviour and creating a sense of safety and comfort. Ensuring that this is embedded into the design has been an important consideration. To achieve this the development blocks have been arranged with a clear definition of public and private space to ensure that all public spaces can be framed by active frontages.

Lighting: Appropriately illuminating public routes and spaces will be essential in providing a safe environment after dark. An initial lighting strategy has been included within this report to outline how this could be achieved.

To help make Cardiff Hendre Lakes a comfortable place to work in and visit, clear lines of sight between key spaces such as the station square, the central spine and the Faendre Reen edge are proposed to aid orientation.

A pedestrian priority approach to the streets and public realm will encourage lower vehicles speeds and help reduce the prospect of serious collisions.

Ancillary uses such as cafés, and restaurants around the station square will help ensure life and activity after dark.

Main Park will be a cherished open space for local people which will contribute to the sense of community spirit.

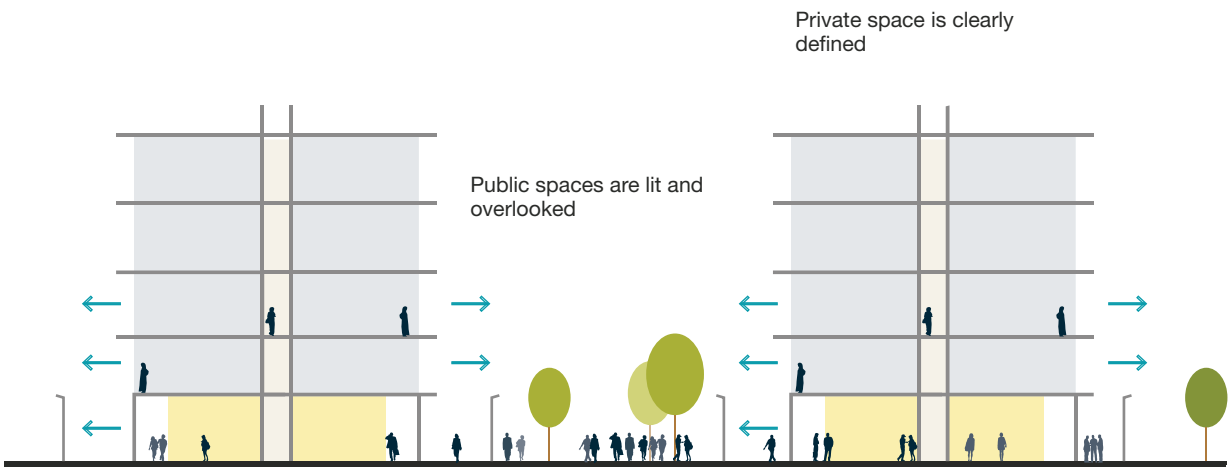


Fig. 119 | Community safety through natural surveillance


7. Access

7. Access

7.1 Inclusive Access

LEGISLATION & POLICY

The development will be undertaken with consideration to the Equality Act (2010) and the requirement to protect against discrimination.

This section primarily considers how design of the development can impact upon access equality for people with disabilities, however broader consideration is also given in the design of the development to enable inclusive access based on other protected characteristics, including amongst others age and gender.

Consideration has been given to the following specific requirements in relation to inclusive access:

- Planning Policy Wales;
- TAN15: Design;
- TAN18: Transport; and
- Cardiff and Newport Local Development Plans.

Where design relates to the railway station building, consideration is given to the following:

- DfT 'Design Standards for Accessible Stations' (2015);
- Railways *Interoperability' Regulations (2011) and 'Persons of Reduced Mobility' Technical Specifications; and
- Network Rail's 'Spaces and Places for Everyone' guidance (2015).

STATION AND INTERCHANGE

The design of the station comes under parallel Network Rail consenting process, Governance for Railway Investment Project (GRIP):

- Research of diversity of local demographic, considering evidence in relation to all protected characteristics;
- Written feedback consultation with local disability groups;
- Consultation discussions with local disability groups; and
- Network Rail Built Environment Accessibility Panel Consultation.

Regarding progression of the station, the following were agreed to be undertaken as the project progresses:

- The points raised from consultation sessions are to be considered as part of the design development process;
- The design team will consult with an Access Consultant during design development;
- The design team will consult with Transport for Wales Rail Services (TfWRS) regarding what CIS and signage solutions will look like, as well as management of the station; and
- The Diversity Impact Assessment will be reviewed and updated during the next design stage.

Detailed design of these areas of the site will be undertaken in consultation with Cardiff Council's Access Officer and local access groups to enable the site to be tailored to the needs of the widest potential range of users.

Fig. 120 | Artists Impression of Cardiff Parkway Station

7.2 The Interchange

Enhanced accessibility is at the heart of the proposed development in the form of the proposed new Cardiff Parkway railway station and transport interchange. This will allow for multiple modes of transport to be connected in a single location, encouraging travel by sustainable modes. Transport interchange facilities can assist in meeting the social, economic and environmental needs of southeast Wales.

A draft interchange design has been developed and reviewed by the Network Rail Built Environment Accessibility Panel (see fig 115). The railway station has also progressed through the GRIP Stage 3.

This section outlines the design brief for the transport interchange, the detail of which will follow in subsequent planning stages.

Pedestrians

The interchange will provide a safe, secure and coherent pedestrian environment with clearly defined routes. The interchange zone will be permeable, providing people with choice for how to move around.

Whilst Manual for Streets recommends footway widths of 2m to allow two wheelchair users to pass, additional width will be provided to accommodate the anticipated footfall and provide a high-quality pedestrian environment. Crossings will be provided giving pedestrians priority over other modes such as the car.

Cycle

Standards require cycle parking for 5% of adjoining passengers, equating to approximately 35 cycle stands. To support the increase cycling secure and sheltered cycle parking provision for 100 cycles, with charging points to provide provision for electric cycles, are proposed.

Cycle stands will ideally be sited a maximum of 50m from the railway station, in a location that is reached by bike and directly accessible from a cycle lane or shared footway/cycleway. These cycle paths will be accessible from cycle routes connecting to the wider area, with access paths designed to limit conflict with pedestrians and vehicles.

Nextbike have also introduced a bike share scheme in Cardiff which allows riders to rent a bike and cycle between five bike stations located across the city including at County Hall and Cardiff Central Railway Station. It is proposed that an area of 45m2 is safeguarded for a Nextbike station. It is envisaged that this station would need to accommodate up to 30 cycles, with monitoring of demand proposed.

Bus

As presented in the previous section, bus stops are proposed near the station to facilitate easy transition between modes. Depending on the mix of services extended into the site, two or three bus stops will be required, however this will be confirmed following discussions with the local bus operators.
For rail replacement services, vehicles could utilise the bus stops (dependent on demand from scheduled local services) or could be accommodated in the immediate local road system around the station. Rail replacement tends to be required at weekends, when demand for the other uses nearby is likely to be lower.

Taxis

Taxi facilities at Cardiff Parkway station have been sized based on data taken from Bristol Parkway. Based on this information, the facility at Cardiff Parkway should provide a minimum of two set down spaces (in layby form), and a primary rank and pick-up area of 10-15 spaces.

Taxi ranks that underprovide on capacity can result in taxis parking in inappropriate locations, potentially impacting the operation of the overall interchange facility. The design of the taxi rank should therefore consider the potential for future expansion and methods to deter parking in unallocated areas.

Car Parking: Drop off and private hire vehicles

For passengers and staff being dropped off at the railway station, ten spaces will be provided near to the railway station within a 100m walking distance. Based on the survey of Bristol Parkway, ten spaces should be sufficient to meet demand.

Car Parking: Accessible Car Parking

Parking for Blue Badge Holders should be located as close as possible to the facility it serves, preferably within 50m. The surface of designated parking spaces should be even and stable, with any variation of surface profile not exceeding ± 5mm.

At railway stations, the Code of Practice BS8300 states that 5% of parking should be accessible and a further 5% should be suitable for future conversion. The standards do note that for larger car parks, this can result in some accessible parking typically left unused and therefore it may be appropriate to seek a deviation of these standards. Based on a car park of 600 long-stay parking spaces, 30 accessible parking spaces should be provided.

Station Park & Ride

Up to 650 parking spaces are proposed for the park & ride car park (including accessible parking) and the short-stay and drop-off. It is therefore expected that there will be a minimum of 600 long-stay parking spaces serving the station.

This surface car park, which will also include electric charging provision, will have all spaces within 400m walking distance of the railway station entrance . Where possible, the car park should be located where direct pedestrian access to the station can be achieved without the need to conflict with road traffic. Suitable crossing points will be provided where there is a road between the car park and station.

Electric vehicle charging will be provided for 10% of long-stay parking spaces to reflect PPW 10. Passive provision is proposed so that the other 90% of spaces can be easily converted in response to market or regulatory demand.

The car park will also include provision for motorcycles. These spaces should be located closest to the station.

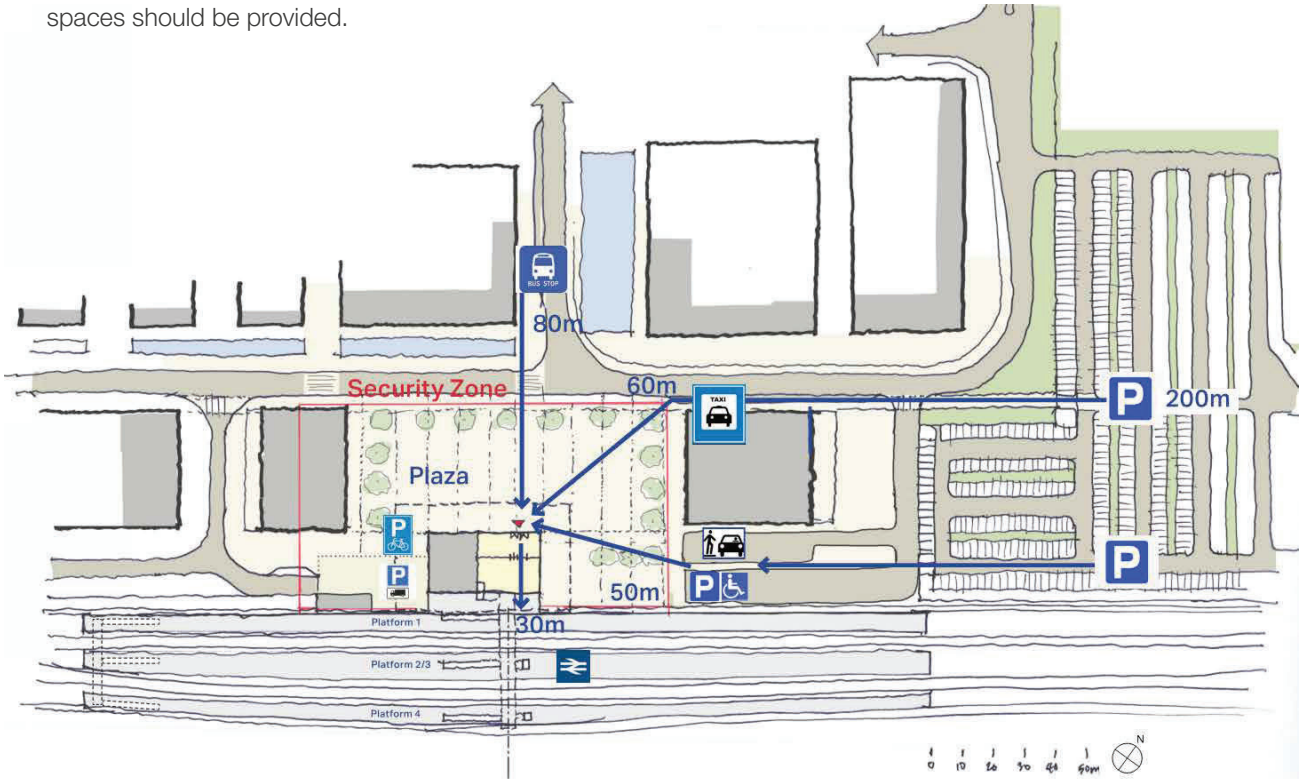


Fig. 121 | Illustrative layout of proposed interchange

LAYOUT & DESIGN

The proposed development is submitted in outline without detailed proposals for public realm, internal access routes and buildings.

In order to enable the development to be accessible, each future phase of development will be accompanied by an access statement.

A strategic approach will be taken to ensuring that the wider development is accessible to all, ensuring that:

- The site layout and network of streets is legible and supports easy movement around the site;
- Key routes are direct, open, overlooked, well maintained, well lit, and feel safe for all users;
- Tactile paving, audible information and other sensory aids are provided to enable the site to be navigable by blind and partially sighted people, deaf and hard of hearing people, as well as people with varying cognitive abilities;
- Benches and other street furniture will be provided at regular intervals around the site to allow space for people to rest;
- Wayfinding signage is easy to understand, positioned to be readable by wheelchair users, and legible for people for of varying abilities; and
- Wheelchair accessible car parking parking spaces and cycle parking for adaptive bicycles will be provided at convenient locations within the development.

The detailed design of streets, public spaces and buildings will ensure that:

- Streets are easy to cross, including dropped kerbs and/or flush surfaces, where required and controlled crossing points where there are highly trafficked roads;
- Tactile paving and other physical wayfinding points are provided to help blind and partially sighted people safely navigate trafficked spaces;
- Street furniture and other objects in the public realm are designed and positioned to avoid creating obstacles and risks for blind and partially sighted people;
- The public realm is step free and easy to move around for wheelchair users and people with buggies, as well as other pedestrians; and
- Primary building access points are step free, and multi-storey buildings have lift access. Building interiors are accessible and include toilets and changing facilities for a wide range of users.

The detailed design of the station, interchange and associated public realm will consider evolving technology and ergonomic development of elements within the site to best suit the diversity and inclusion of our society.

7.3 Other Access Requirements

EMERGENCY ACCESS

The site layout includes two potential points of access and a permeable network of internal streets, creating a choice of routes for emergency vehicles and resilience against incidents which may block access.

SECURITY & SAFETY

For the purposes of security, the masterplan restricts vehicle access from a perimeter of 30m from the station building to protect crowded pedestrian areas from risk from vehicle collisions. Further detailed work will be undertaken with the aim of allowing blue badge parking to be located closer the station entrance.

The detailed design of the station, interchange and associated public realm will consider the needs of managing large crowds associated with events or other busy periods.

CYCLE PARKING

Cycle parking be will provided throughout the proposed development at key points within the public realm and close to the public transport interchange, including a proposed cycle hub with space for 100 bikes. This will include spaces for adaptive cycles.

Charging points for Electric bikes will be provided within the development, based on demand and policy requirements at the time of construction.

Secure cycle parking will be provided on plot for all proposed buildings, to meet or exceed requirements set out in the Cardiff Local Development Plan.

CAR PARKING

Car parking will be provided either on-plot or in shared car parking areas within easy walking distance of new buildings. Limited on-street and short stay visitor parking will be provided throughout the development.

The amount of car parking provision will not exceed Cardiff Council's maximum car parking standards. Management of car parking provision will consider opportunities to promote sustainable modes of access over private vehicles. This will be considerate to the changing accessibility context of the site, and may require a phased and evolving approach to car parking provision.

Charging points for Electric Vehicles will be provided within the development, based on demand and policy requirements at the time of construction.
Full details of car parking provision can be found within the Transport Assessment.

SERVICING

Perimeter block arrangement will allow for servicing to take place away from the public realm. Designated servicing for the station building away from the interchange space.

8. Indicative Phasing

8. Indicative Phasing

The proposed development will be phased to facilitate the provision of the new station, associated access and facilities from an early stage. Preparatory work will including environmental and flood mitigation works to facilitate the early phases of development.

ENABLING INFRASTRUCTURE
2021-2023

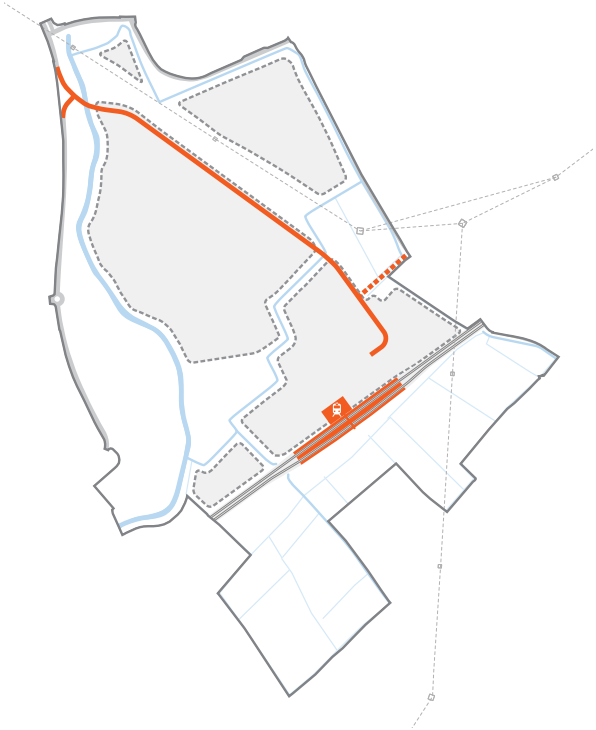
Prior to construction of buildings, it is necessary to create development plateaux consistent with the flood mitigation strategy, and associated habitat mitigation.

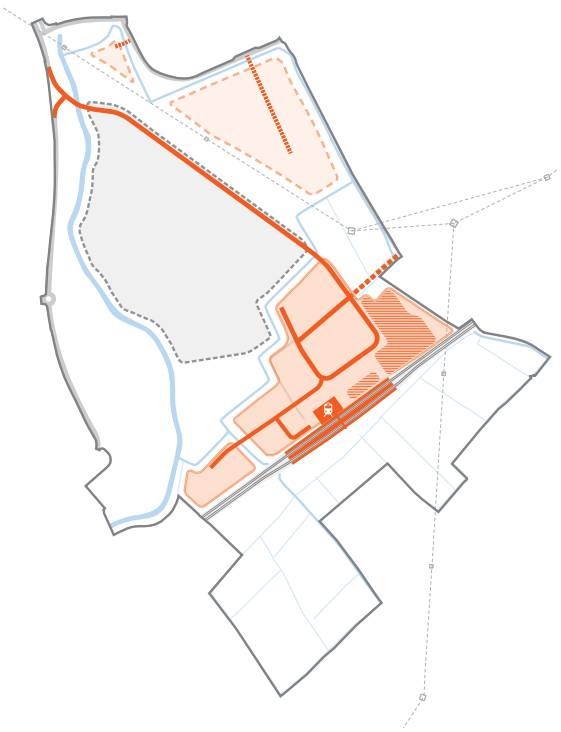
The initial phase will be to the south of Ty Ffynnon Reen and north of the railway line, which will facilitate construction of the station building and first commercial buildings. Associated with this will be construction of the main highway and associated buried services.

EARLY PHASES
2022-2025

The new station will be supported by the development of new buildings around the Station Square, creating a sense of arrival and ensuring that new development benefits from public transport access.

The north eastern corner could be developed independently, and earthworks in this area could be undertaken as an early phase or in parallel.

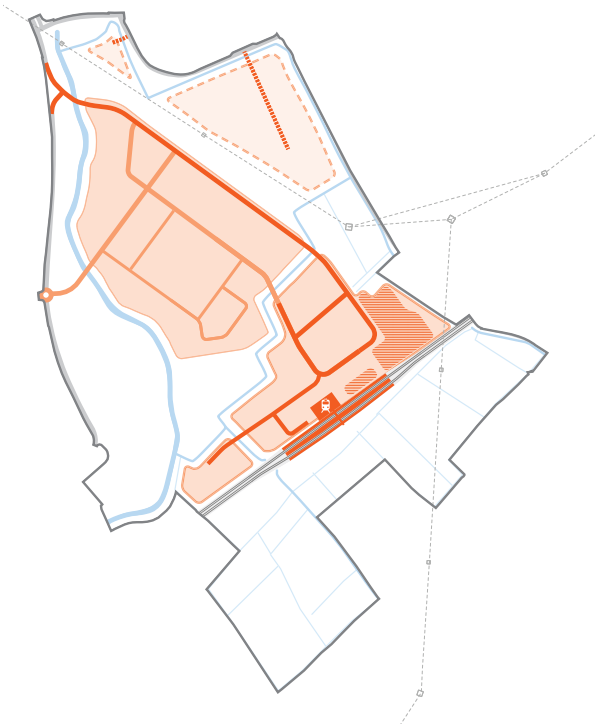




MIDDLE AND LATER PHASES
2025-2028

Earthworks will be completed across the whole development area in a phased manner creating plateaux for future buildings and public realm. The phasing of these earthworks is to be finalised. In total, earthworks across the site are expected to take a minimum of 4-5 years.

Commercial development across the site will be phased in response to market conditions.



Glossary

CCR Cardiff Capital Region

CLDP Cardiff Local Development Plan

DAS Design & Access Statement

ES Environmental Statement

FCA Flood Consequences Assessment

GRIP Governance for Railway Investment Project

GGAT The Glamorgan & Gwent Archaeological Trust

NCC Newport City Council

NDF National Development Framework

NLDP Newport Local Development Plan

PPW Planning Policy Wales

PRoW Public Right of Way

SINC Site of Importance to Nature Consevation

SSSI Site of Special Scientific Interest

SuDS Sustainable Drainage Systems

TAN Technical Advice Note

TOD Transit Orientated Development

WBFGA Well-being of Future Generations (Wales) Act 2015

WG Welsh Government

WSP Welsh Spatial Plan

For further information please visit our website:
www.cardiffhendrelakes.com