

Dundrum Central SHD Landscape Design

Proposed SHD on lands at the Central Mental Hospital, Dundrum Road, Dundrum, Dublin 14.

Landscape Architecture & Public Realm Design Report

Quality information

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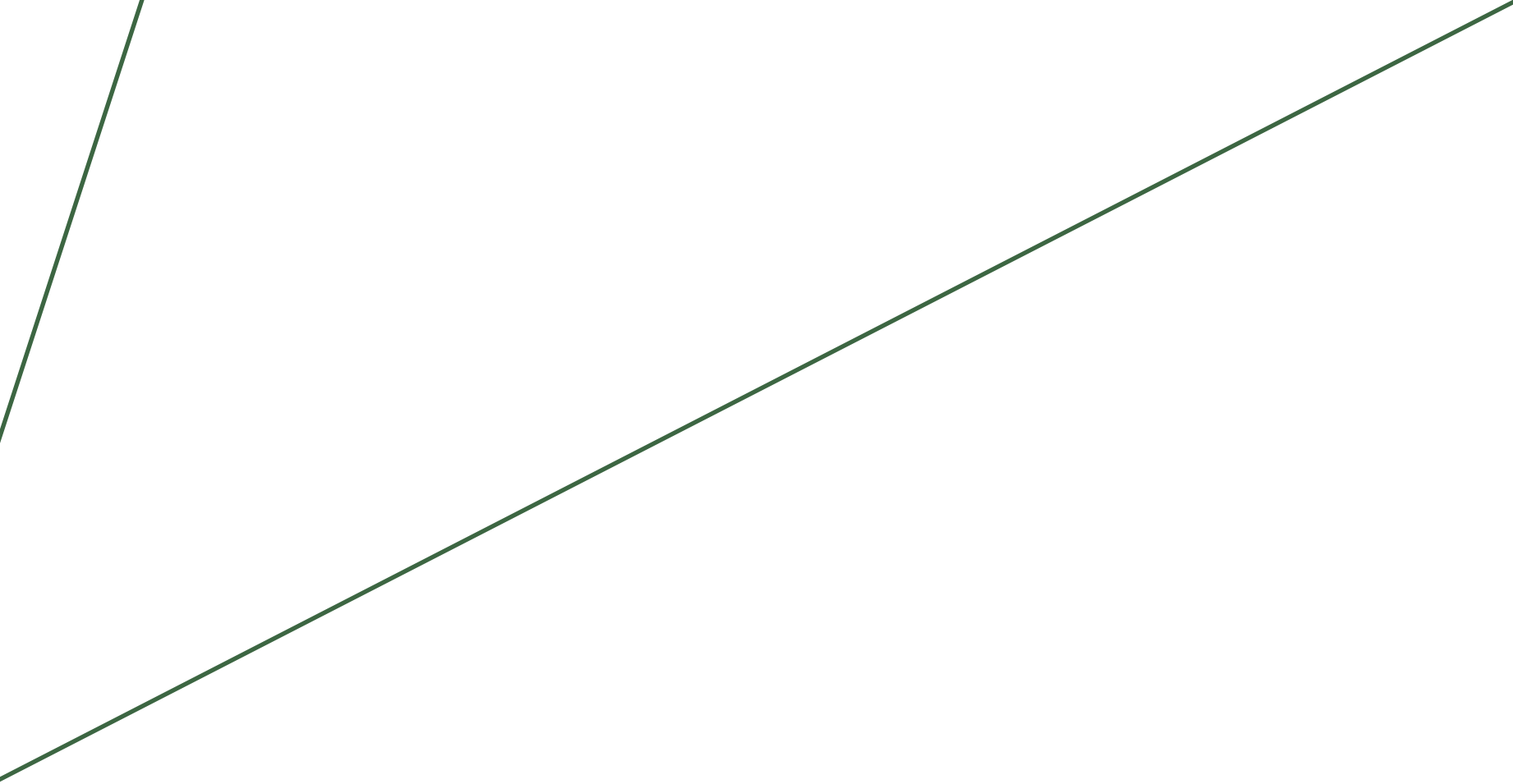
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Context and Site Overview

01





Context and Site Overview

Local Context

The site to the north of Dundrum is enclosed by high stone walls on all sides. The site is primarily surrounded by residential properties which back on to the site. Matured vegetation with the back gardens of properties is a key characteristic of the site. The land abuts Rosemount Green to the south, Dundrum Road and Annville Park to the west. The area has a number of amenity green spaces, a couple of playgrounds and private sports provision, but lacks high quality open spaces which can be found in other areas of Dun Laoghaire Rathdown. The adjoining image highlights the different open spaces in the vicinity of the site.



Site Overview Legislative and Policy Review

Dún Laoghaire–Rathdown County Council Development Plan 2016 - 2022 & Dún Laoghaire–Rathdown DRAFT County Development Plan 2022-2028

Dun Laoghaire-Rathdown County Council

The County Development Plan sets out policies and objectives for the continuing sustainable development of the County, including the area of Dundrum. The following policies are relevant to Dundrum and its landscape development.

Sustainable Communities Strategy

2.2.7.1 Policy ST5 : WALKING AND CYCLING

As part of the Development Management process, new development will be required to **maximise permeability and connectivity for pedestrians and cyclists** to create direct attractive links to adjacent road and public transport networks.

Green County Strategy

To promote and develop a coherent and integrated green infrastructure network across Dún Laoghaire–Rathdown which will secure and enhance biodiversity - including the protection of Natura 2000 sites - **provide readily accessible parks, open spaces and recreational facilities, maintain historic and landscape character areas** and provide for the **sustainable management of water** through facilitating the retention and development of a network of green spaces in urban and countryside locations to serve the needs of all citizens and communities in the County.

4.1 LANDSCAPE,HERITAGE AND BIODIVERSITY

Recognising the close relationship between the landscape, natural heritage and recreational open spaces. The distribution of landscape, natural heritage and recreational assets across the County are vitally important to creating an accessible County. The entire population of the County should have access to nature, parks and strategic public open space.

4.1.3.1 POLICY LHB19 : PROTECTION OF NATURAL HERITAGE AND THE ENVIRONMENT

Retention of trees,hedgerows and woodlands wherever practical.

Identification of Views and Prospects of special amenity value or special interest.

Working with local communities, groups, landowners, National Parks and Wildlife Service (NPWS) and other relevant parties to identify, protect, manage and, where appropriate, enhance and promote understanding of sites of local biodiversity value.

4.2 OPEN SPACE AND RECREATION

Objectives :

- To provide networks of **accessible, high quality open spaces** and sport and recreation facilities which meet the needs of all residents and visitors, are fit for purpose and are economically and environmentally sustainable.
- To **protect and improve established green areas** and public open spaces.
- To **protect, improve and enhance recreational areas.**
- To provide new parks and green spaces with proper **facilities in new development areas** and communities.
- To develop and improve **physical linkages and connections** between the network of parks and public open spaces in the County.
- To ensure **proper access to the recreational facilities** of the County for all.

4.2.2.5 POLICY OSR6: ALLOTMENTS AND COMMUNITY GARDENS

It is Council policy to support the development of additional public allotments and community gardens to improve their provision and distribution across the County.

4.2.2.3 POLICY OSR7: TREES AND WOODLAND

Trees, groups of trees or woodlands which form a significant feature in the landscape or are important in setting the character or ecology of an area should be **preserved wherever possible.**

The Council will identify and act on opportunities to provide for new tree planting in conjunction with new urban design/development and infrastructure and will plan for new planting to add to the overall 'urban forest' and so help improve the built environment. The term 'urban forest' embraces trees grown in, and close, to urban areas, including trees in streets, parks, gardens, on underdeveloped land and those in urban

4.2.2.13 POLICY OSR15: PLAY FACILITIES

In line with the National Play Policy provision should be made to include **suitable play opportunities for all ages of the child population.**



DRAFT DUN LOAGHAIRE-RATHDOWN DEVELOPMENT PLAN 2022-2028

The Draft County Development Plan introduced Specific Local Objective (SLO) No. 113 at the southern part of Central Mental Hospital lands. The Draft Plan also introduced a corresponding SLO on the northern part of Rosemount Green. The recently published material alterations do not propose any amendments to the SLO, which states:

“Any integration of/ or connectivity between the Central Mental Hospital lands with the adjoining residential area should include the **development of enhanced sporting facilities/** infrastructure for existing and future residents.”

The Draft Development Plan includes the addition of three new tree symbols to the Central Mental Hospital lands. Refer to Map 1 of Draft Development Plan.

The corresponding policy wording in the Draft County Development Plan sets out the intention of the tree symbol:

“New developments shall be designed to incorporate, as far as practicable, the amenities offered by existing trees and hedgerows. New developments shall, also have regard to objectives to **protect and preserve trees and woodlands** (as identified on the County Development Plan Maps). The tree symbols on the maps may represent an individual tree or a cluster of trees and are not an absolute commitment to preservation. Decisions on preservation are made subject to full Arboricultural Assessment and having regard to other objectives of the Plan.” (Page 287)

Context History

Dundrum - Windy Arbour OSI 1837-1842

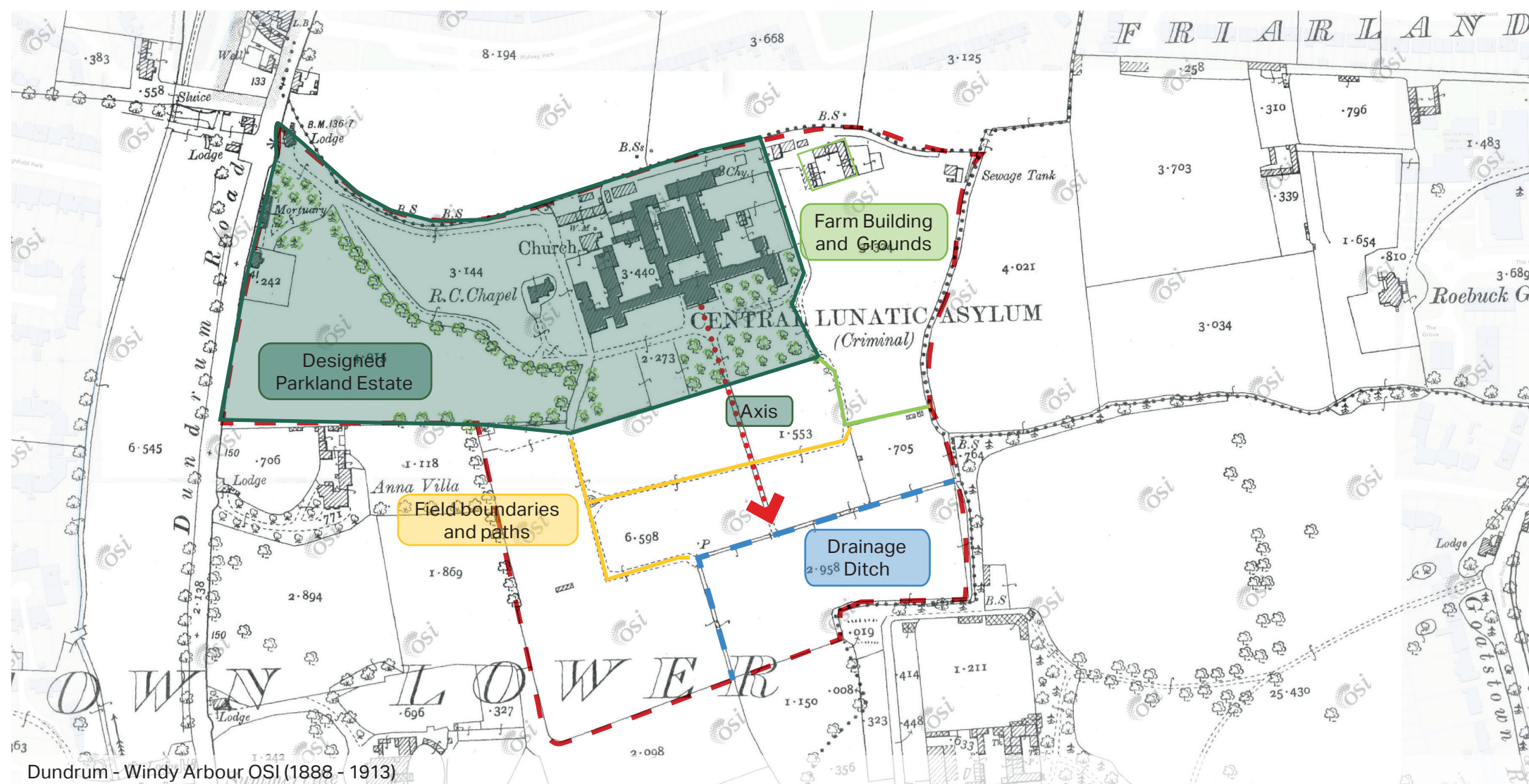
The site in 1837 was made up of an irregular field pattern, surrounded by large manor house demesne to the south and east. Some fields are delineated by trees

Dundrum - Windy Arbour OSI (1888 - 1913)

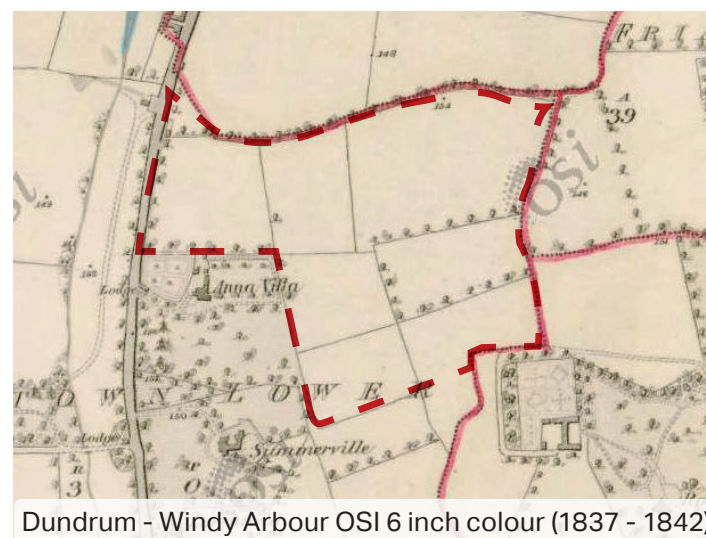
This map has the greatest amount of historic detail of the site itself including the hospital. The plan shows the designed parkland setting in the north of the site to the entrance along Dundrum Road and in front of the hospital. The farm buildings in the north east of the site are also visible. Agriculture / agrarian fields make up the rest of the landscape. A drainage ditch separates the land in the south east corner of the site.

Dundrum - Windy Arbour OSI 6 Inch Cassini - (1913-1930)

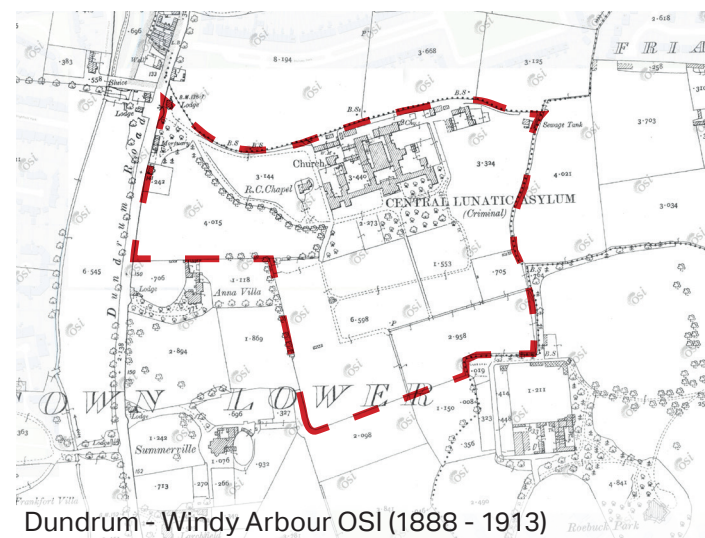
The site is identified only by the text *Central Lunatic Asylum (Criminal)*, with no detail within the boundary walls. Development is primarily to the east of the site, along Dundrum Road, Annville Park and Highfield Park. Some large manors/villas are still visible within the vicinity of the grounds, albeit with smaller grounds. Open agricultural fields are still visible to the north/ east and south



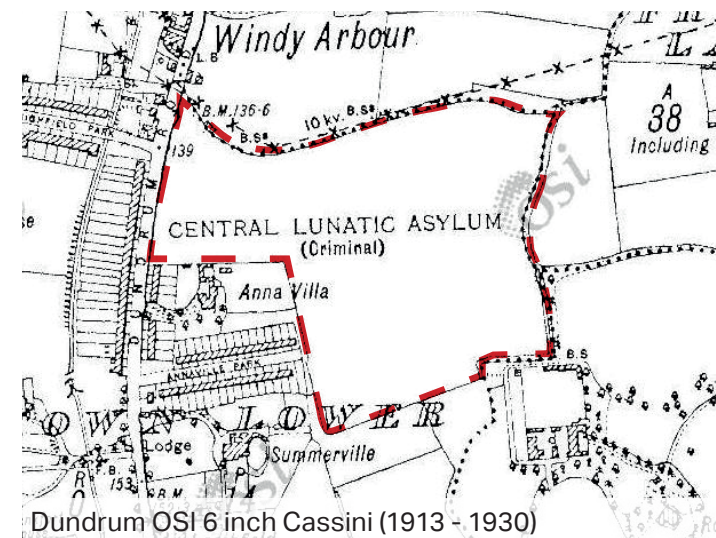
Dundrum - Windy Arbour OSI (1888 - 1913)



Dundrum - Windy Arbour OSI 6 inch colour (1837 - 1842)



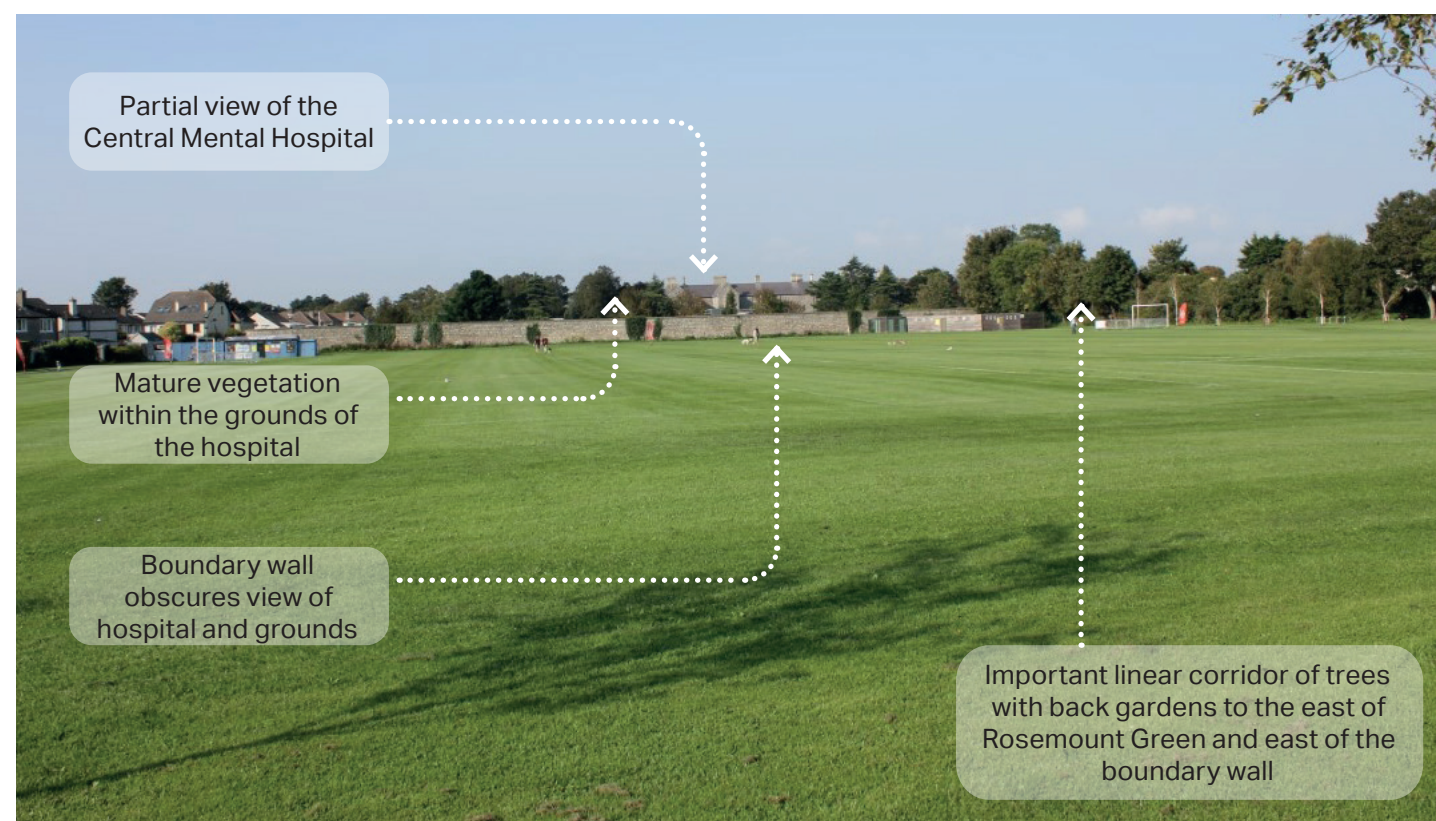
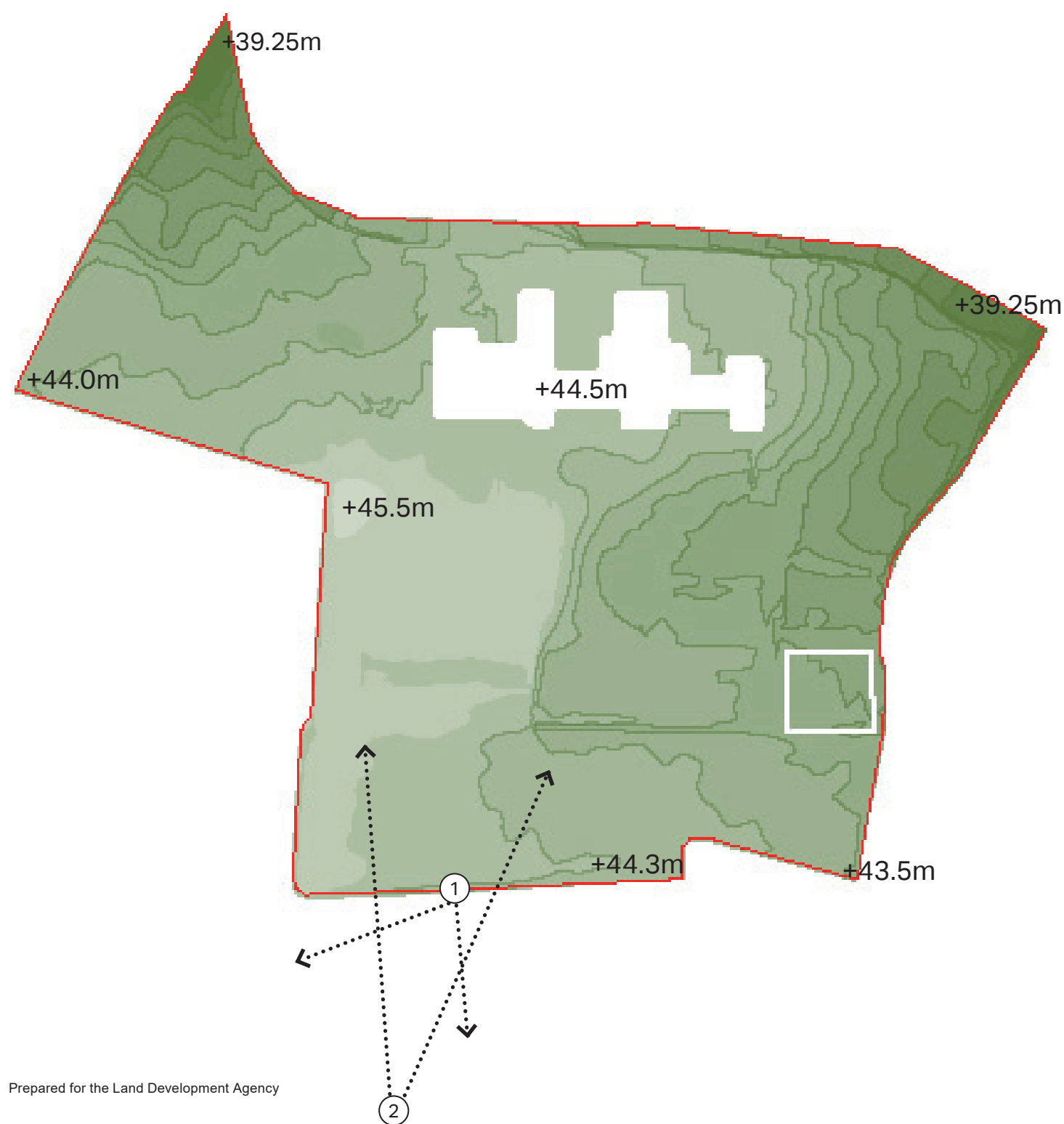
Dundrum - Windy Arbour OSI (1888 - 1913)



Dundrum OSI 6 inch Cassini (1913 - 1930)

Analysis - Site Topography and Views

The site has over 6 meters of height difference. The highest point in the middle of the site falling to the edges. The majority of the site lies between 44.0 and 45.5 for a fairly flat centre area. The main hospital building sits at 44.5m.



View 1: Rosemount Green offers the best long distant view of the central mental hospital



View 2: Extensive views south over Rosemount Green offers long distant views of the Dublin Mountains

Analysis - Site Tree Conditions

A detailed survey and a tree protection plan was undertaken by a qualified arborist.

Please refer to their report and drawings whilst reading the landscape package.

The site contains a variety of good quality mature trees.

Category A trees are located in clusters throughout the parkland.


Mature Lime trees outline the main drive are visually pleasing and in good health.

A group of trees along the ditch in the middle of the site contains some large specimens.

There is a orchard grove of approximately 20 apple trees, with varying degrees of quality.

The walled garden contains a number of poly-tunnels and a rose garden. The area to the north of the walled garden has a strong sense of enclosure formed by trees to the north and the boundary walls of the garden and the site.

Tree Constraints Plan from Arborists

-  High Retention Value
-  Medium Retention Value
-  Low Retention Value



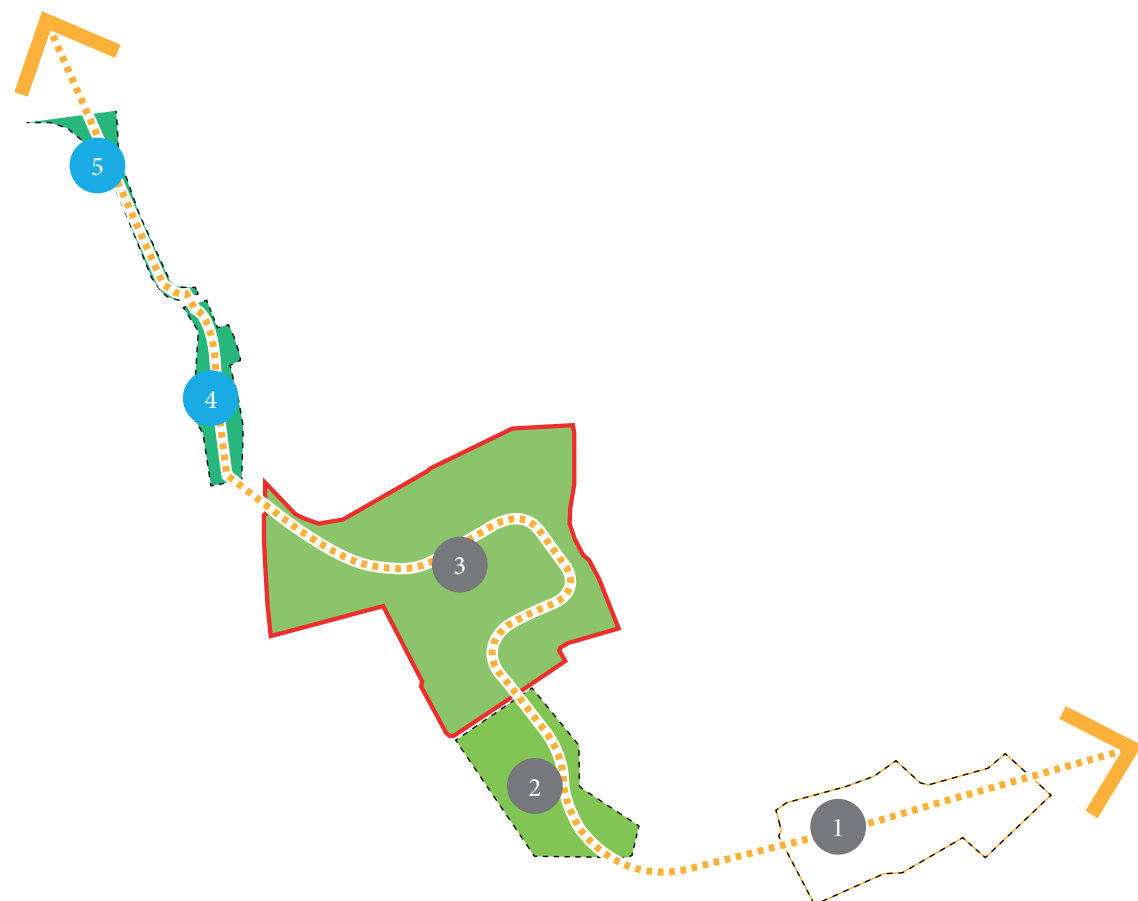
Analysis - Boundary Wall

The existing wall surrounding the site plays an important role in the character of the site. The boundary wall creates a sense of separateness from the surrounding area and contributes to the sense tranquillity and relief from the surrounding urban area.



Analysis - Urban Ecosystem Network





Blue/Green Corridor



Green Amenity



Recreational Ground



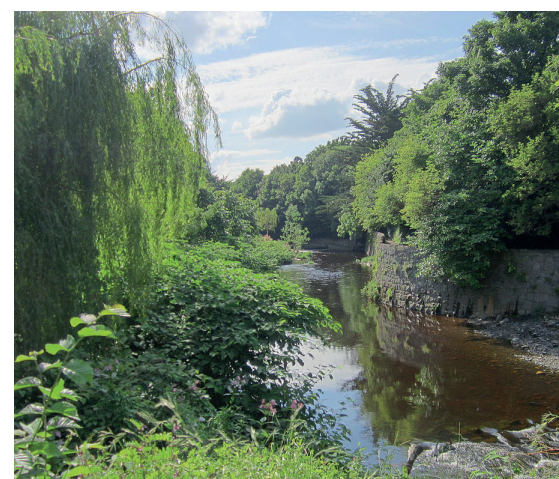
River Slang



Main Site



Rosemount Mulvey
Football Club



River Dodder



Playground Goatstown



CUS Rugby Ground

Urban Ecosystem

The site has potential to create a new ecological link from Windy Arbour to the Glass Bottle Site and towards Goatstown Road. Providing ecological corridors and connectivity to the River Slang, Rosemount Green, Milltown Golf Course and other green spaces throughout Dundrum. It also has the potential to greatly improve pedestrian and cycling connectivity across the area, providing the local community greater access to green spaces and recreational grounds both within Dundrum Central SHD and in the surrounding area.

Analysis Strengths, Weaknesses, Opportunities & Threats

On-site Findings

A spatial analysis exhibits the various strengths, weaknesses, opportunities and threats found across the site from a landscape perspective. This SWOT approach demonstrates a number of key observations that are to inform a public realm design approach.

Categorisation

A colour-coded plan of these four categories illustrates a variety of findings (opposite). This framework provides the design team with a summary of findings from across the site.



Site Heritage

Enhancement of the sites Vernacular Architecture and Historical Context.



Notable Planting

Existing mature trees stand tall covering a large portion of the site.



Site Wall

The boundary wall create a special character and sense of tranquility and a sense of relief from the surrounding urban environment



Edge Conditions

There is a 4m tall masonry wall separating the site from its surrounding context



Dominant Site Character

The existing character of the site is institutional. Significant change in character would be beneficial.



Weaknesses

Existing Landscape Conservation

Renovation and reuse of the existing landscape on site.



New District in Dublin

The site has been inaccessible to the public.



Space Linkage

Improved access to the site. Better connection between Dundrum Road, Rosemount Green and Goatstown Road.



Boundary

Lack of permeability and activity on through the site could lead to dark corners or antisocial behavior.

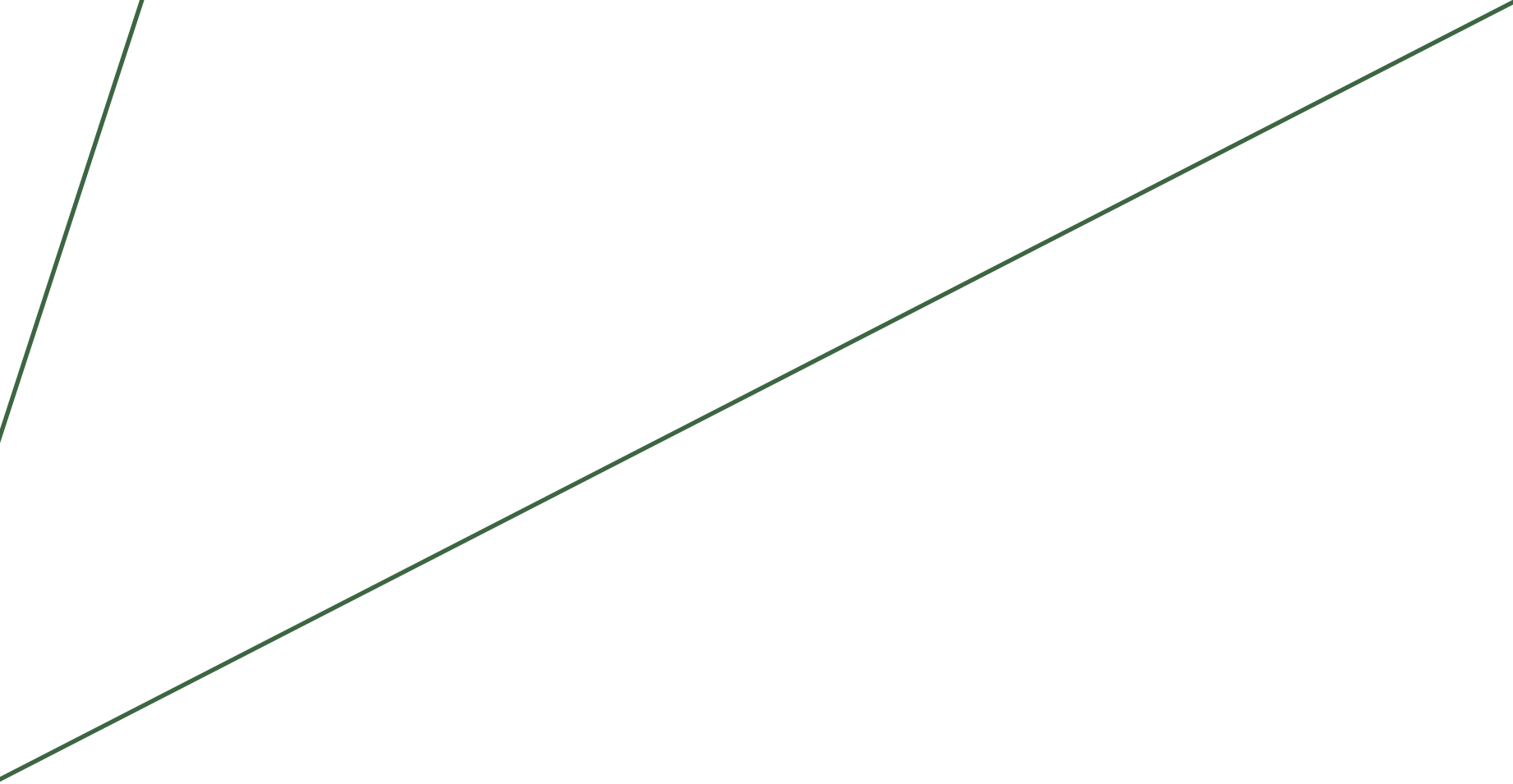


Threats

Landscape Development

02





Landscape development

Landscape Concept

The landscape has been inspired by history of the site.

A hospital within a parkland setting, acting as a place of tranquility and restoration, and associated with the Picturesque movement, which places emphasis on the pictorial values of architecture and landscape in combination with each other.

- The developed landscape will retain and protect existing mature trees on site. A central parkland retaining the valuable mature trees on site will provide a key amenity reflecting the historic parkland of past.
- The existing walled garden will be retained and enhanced through the development.
- Existing and historic vistas through the site will be re-established through the design of the open space and architecture, providing a sympathetic green framework through the development.
- Landscape planting will be dynamic providing a sensory delight through smell, movement and visual aesthetic establishing a modern development of tranquillity and biodiversity.



View of a London Hospital in an open landscape

Landscape Objectives

The proposed residential scheme comprises of terraced dwellings, duplexes, apartment buildings and Crèche, with associated ancillary works including vehicular access, parking, footpaths, drainage, services, landscaping and site boundary works.

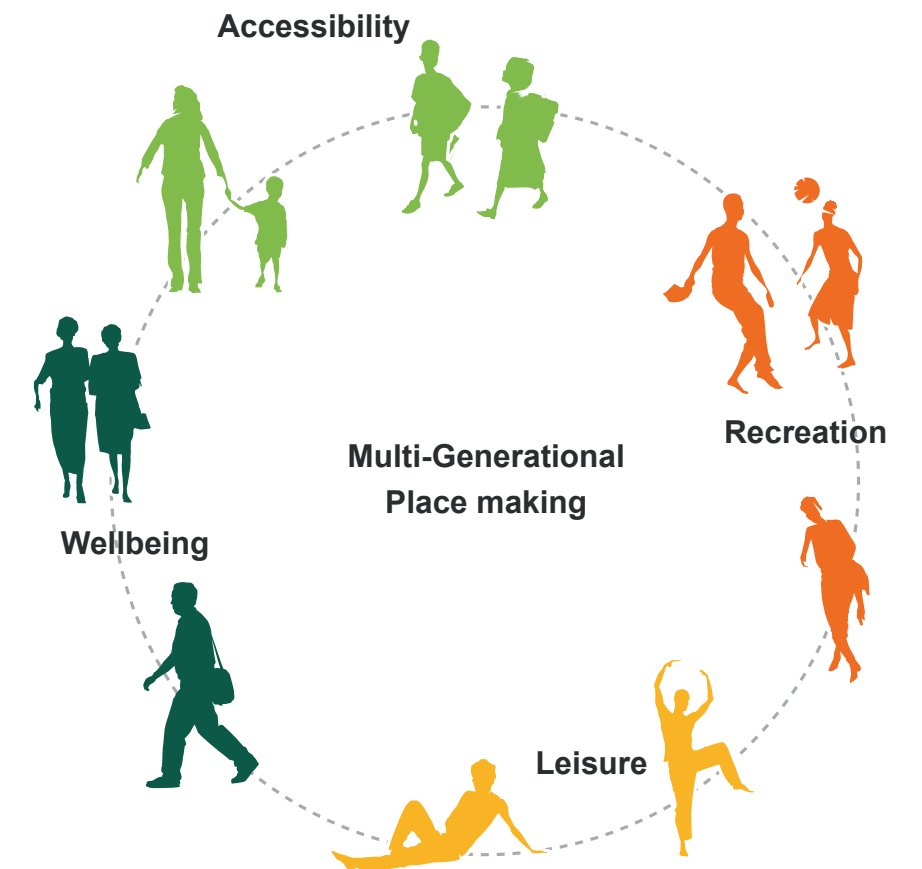
The proposed development follows the DoEHLG Urban Design Manual, Design Manual for Urban Roads and Streets (2019) and Dun Laoghaire Rathdown Development Plan.

The site development strategy is outlined in Reddy Architects Design Statement.

The overriding design intention is to create an inclusive and coherent new community based on best practice urban planning and landscape design principles, giving residents a sense of place, ownership and identity.

The design objectives respond to the site's character:

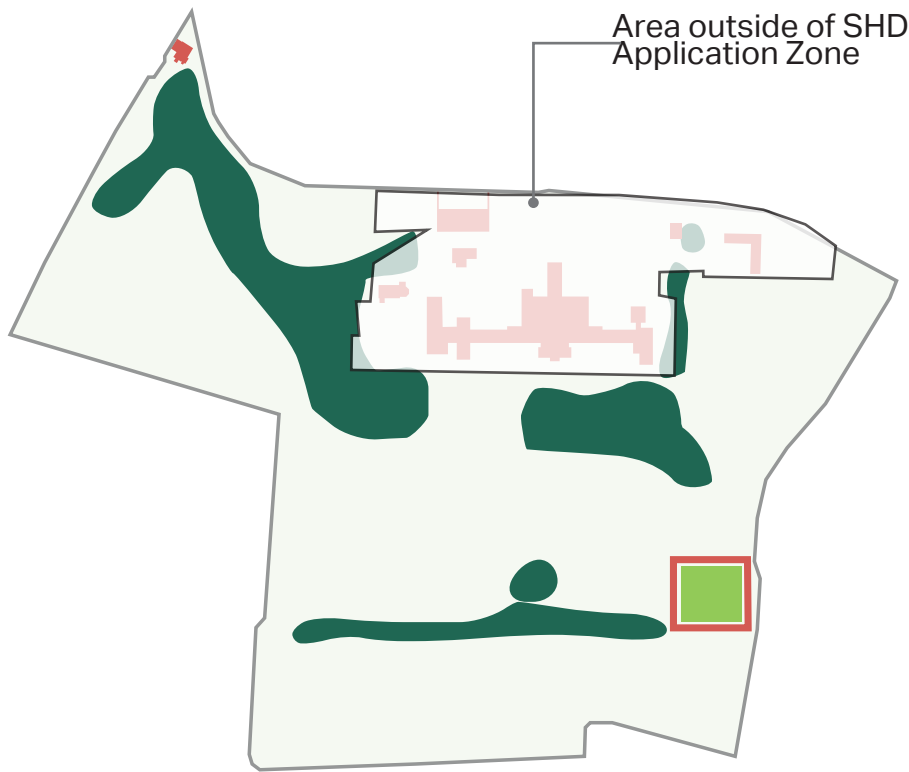
- Retain good quality trees and parkland on site.
- Retain and protect historic boundary stone walls and walled garden on site.
- Form a green spine through development linking residential and amenity nodes.
- Form a hierarchy of quality public open spaces including plazas, parkland, squares, community parks and pocket parks, providing a strong neighborhood identity. Encouraging social interaction, promoting health, well-being and social and civic inclusion.
- New housing to overlook open spaces to ensure passive surveillance of amenity areas. Ensuring the open spaces feel safe, secure for all to use
- Provide a strong SuDs management train whilst forming habitat creation. The scheme will contain environmental features such as tree planting, raingardens, Green roofs, and wetland.
- Form both formal and informal natural play elements throughout the scheme.



On-site Findings

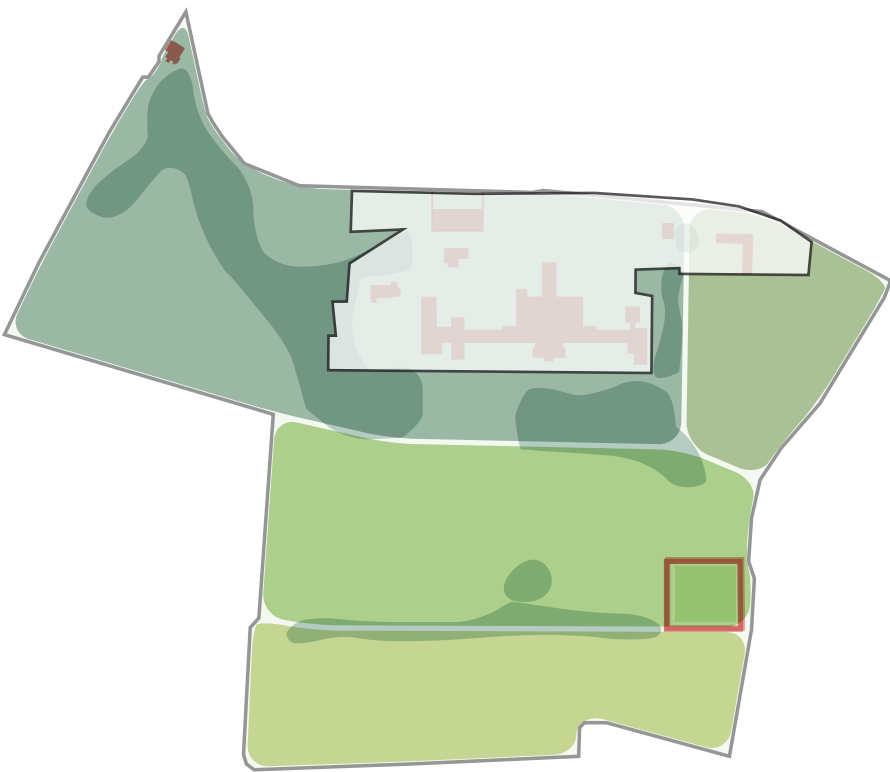
The following diagrams demonstrate the layering of landscape which compose the key open spaces. The illustrations demonstrate a sensitivity to place, existing heritage and landscape features. The Landscape Framework provides improved connectivity and linkages, and provides a structure within which the buildings are set.

Existing Heritage Features



- Heritage Buildings / Structures
- Landscape Heritage Assets
- Walled Garden

Landscape Character

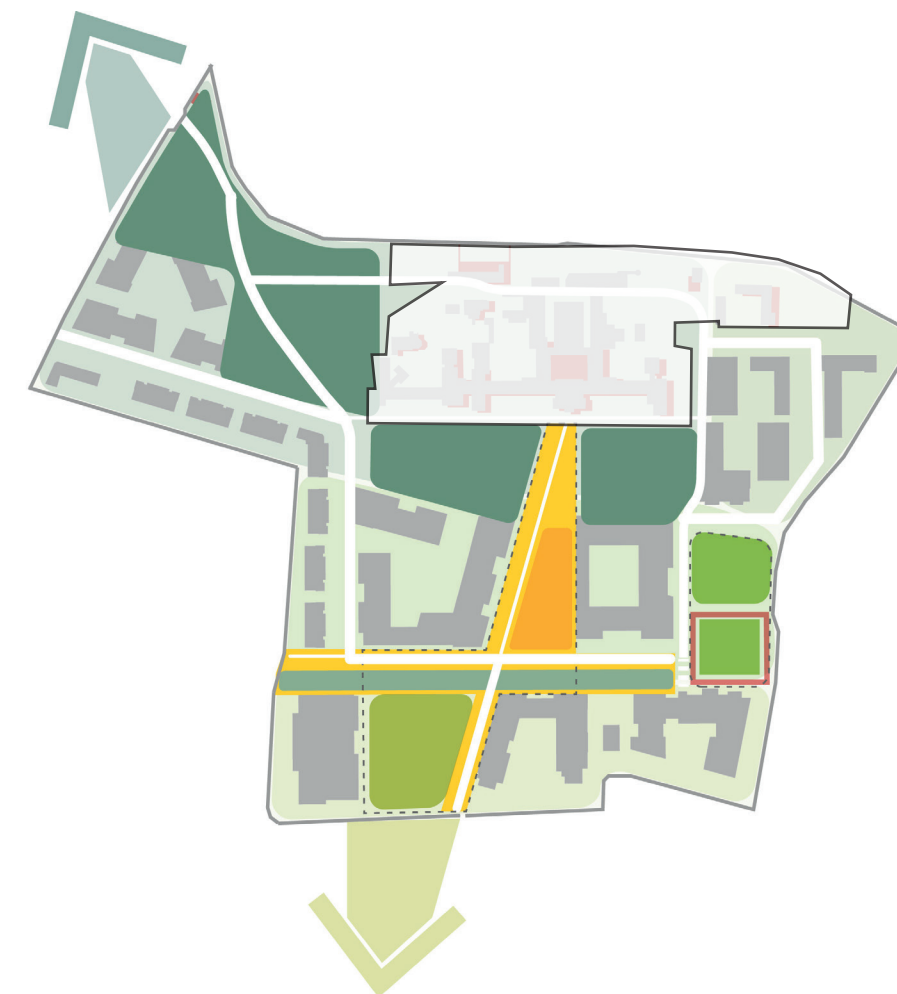
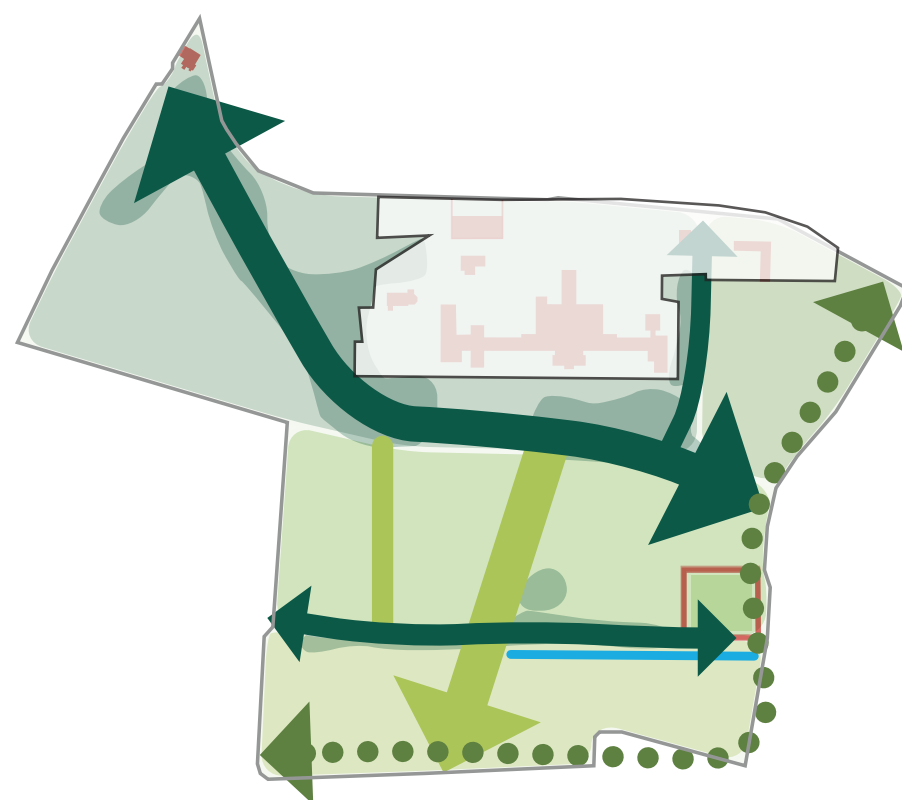






- Parkland
- The Farm
- Agrarian Field Network
- Open Grassland




Landscape Framework








Built Development

Key Open Spaces



-  Heritage Landscape Corridor
-  Landscape Corridor / Connectors
-  Eastern Ecological Landscape Corridor
-  Elm Park Stream

-  Heritage Buildings / Structures
-  Built Development
-  Central Landscape

-  The Parkland
-  Central Landscape
-  Central Square
-  Walled Garden Landscape
-  Elm Park Stream corridor
-  Rosemount Park
-  Boundary / threshold change

Landscape Programme

Recreation

SPORT

PASSIVE RECREATION

PLAY

The aim of the open space strategy is to provide informal recreational space throughout the development, this allows for sport, passive recreation and play. Informal recreational space ensures there is sufficient space to accommodate a variety of sporting and recreational activities, providing space which is flexible and accommodates a wide variety of user groups. This ensure the open spaces are inviting and encourage greater participation in recreational activities and health lifestyle choices.

Environment

LANDSCAPE

HABITAT

WATER FEATURES







All open spaces will be multi-functional, catering for the needs of people, as well as the natural environment, supporting habitat creation, the growing of trees, plants and food. A strong SuDs management Train with collection, conveyance and storing components will not only provide a key blue infrastructure on site but establish new habitats and enhance biodiversity throughout the development. These key components include Green Roofs, Bio retention systems/raingardens, permeable paving, drainage ditches, tree planting and the formation of a integrated constructed wetland in the community park of the development. The integration of these elements in the scheme will not only improve the surface water drainage of the site but improve the surrounding environment and aid climate change mitigation.

Education

PARKLAND



EDUCATION



Dundrum Central SHD contains existing natural assets such as the parkland entrance of mature trees, the walled garden. Other assets and future landscape such as wetland areas can become important educational tools for local children visiting the site, learning about the natural environment, nature and local heritage.

Culture

DESTINATION



EVENTS



The site has the potential to become a key local destination due to location and the quality of the environs. The different open spaces could accommodate a variety of cultural and entertainment events, and the central square could accommodate markets throughout the year.

Leisure







The peaceful and tranquil environs of site, lend themselves to providing some leisure facilities such as coffee shops or cafe's. The environs could provide a unique destination, which provides relief from the surrounding urban environment.



Sports field in the community

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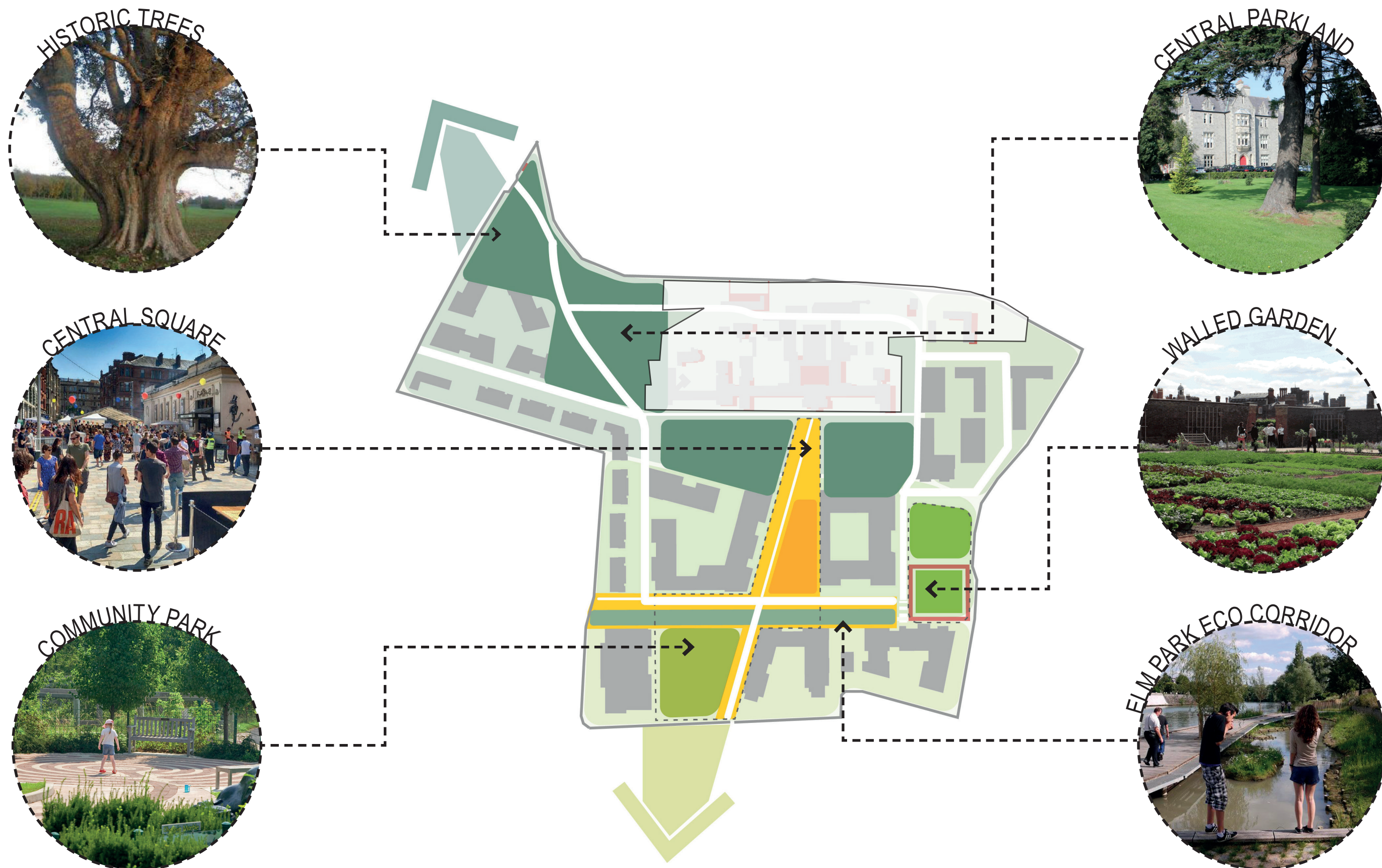


Natural environment for sustainable living



Community activities for social interactions

Key Open Spaces



SHD Landscape Layout



Proposed Boundaries



Existing Wall Proposals

- Removed Wall
- Reduced Wall (Refer to Architects Report)
- Retained Wall

Proposed Boundaries

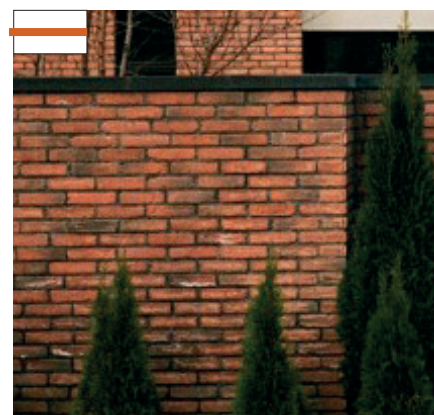
- Proposed Blockwork Wall with Brickface to Public Facade (matching architecture) 2m high
- Post and Panel Fence 1.8m high
- 1.1m Powder Coated Steel Railing with Internal Hedgerow Proposed.
- Low Brick Wall and Railing
- 1.1m Timber Post & Rail (Painted Black)
- Privacy Planting



Low Boundary Wall & Railing



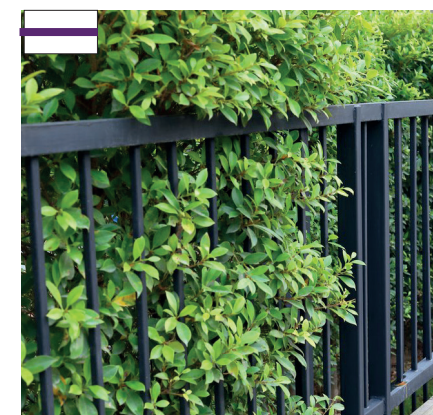
Existing Wall



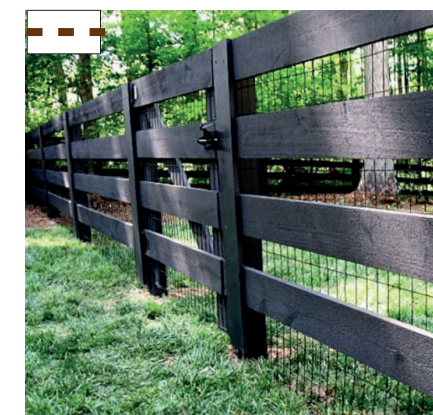
Blockwork Wall with 2m BrickFace



Post and Panel Fence 1.8m



1.1m Steel Fence & Hedge



1.1m Timber Post and Panel Fence



Front Garden Hedge

Central Parkland

The primary aim of the Central Parkland Landscape will be about protecting and enhancing its existing character which is defined by the mature trees and historic landscape as a setting for the hospital building.

The subtle introduction of footpaths and areas of meadow and perennial planting which will define areas of amenity lawn and ensure the space caters for more passive recreation activity and enjoyment the newly accessible mature trees of the site.

Natural play areas located between existing mature tree planting will provide a key distinguishing amenity to the development.

- ① Creche grounds
- ② Cycle lanes / footpath
- ③ Playgrounds
- ④ Pump Station
- ⑤ Existing mature trees
- ⑥ Podium





Macro Works Photomontage of Central Park (Retention of Existing Trees)



Managed grasslands



Natural Play Area



Intimate garden spaces adjacent to civic buildings

Entrance Plaza

The Entrance Plaza, located to the very north-west of the site, provides both the main pedestrian and cyclist entry points to the proposed development.

The high hospital walls will be taken down along the north-west and north east edge of the plaza. This will open up to the existing mature tree planting to the north of the site and provide open views of the sites existing mature trees from Dundrum road.

The wall will be replaced with bollards tracing the path where it once stood. A low wall will be retained in front of proposed structural planting beds providing a sense of enclosure to the space.

The former gatehouse will be converted into a cafe, with an exterior cafe space for furniture. This space serves as the main entrance to the site, and as such has excellent linkage routes both into and out of the site.

- ① Removed Existing Wall Delineated with Bollards.
- ② Lowered Existing Wall to 1.1m
- ③ Structured Planting Beds
- ④ Feature Bench Locations
- ⑤ Restored Gatehouse to Cafe
- ⑥ Outdoor Cafe Area
- ⑦ Shared Surface Feature Paving
- ⑧ Bike Rack
- ⑨ BioRetention Area
- ⑩ Proposed Cycle Connection Opening
- ⑪ Delineated Cyclepath through Scheme
- ⑫ Pedestrian Pathway
- ⑬ Proposed Trees



Entrance Plaza

Entrance Plaza Images



Feature setts and flagstones



Bicycle stands on feature setts



Cycle way access



Feature bench with backrest



Bollards



Outdoor cafe space



Structure planting

Central Square

The Central Square will provide a civic heart to the new community of Dundrum Central SHD.

The concept for the square is the idea of exchange be that commercial, social or cultural. The square will be designed to provide flexibility and accommodate markets, pop up festivals and cultural events.

It's important the square maintains a level of intimacy in the scale of its spaces, so that it encourages everyday activities such as meeting friends, getting a coffee or lunch, encouraging people to linger in the space. Encouraging greater use of the space will help create a more vibrant community and heart to the development.

- ① Fractured Central Park-Raised Beds with Shrub Planting and Seating
- ② Feature Paving/ Flexible Square
- ③ Cycle Way
- ④ Transition Zones
- ⑤ Raingardens with Feature Seating
- ⑥ Passive Green Space
- ⑦ Grid Tree Planting
- ⑧ Disabled Parking
- ⑨ Structured Shrub Areas
- ⑩ Bike Parking Locations
- ⑪ Plaza Lighting
- ⑫ Seating



Central Square Images



Raingardens



Flexible spaces which are intimate in scale



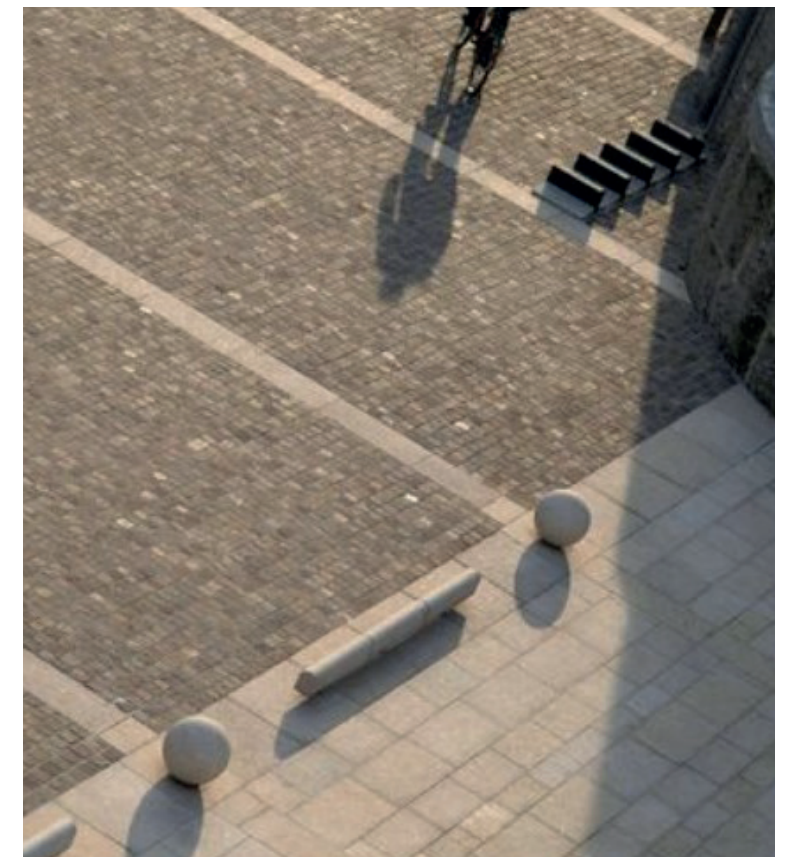
Cafe Space/Outdoor Dining



Flexible Activity Space



Shared Surface Cycleway



Feature Stone Paving

Central Square Photomontage (Macro Works CGI View 6)



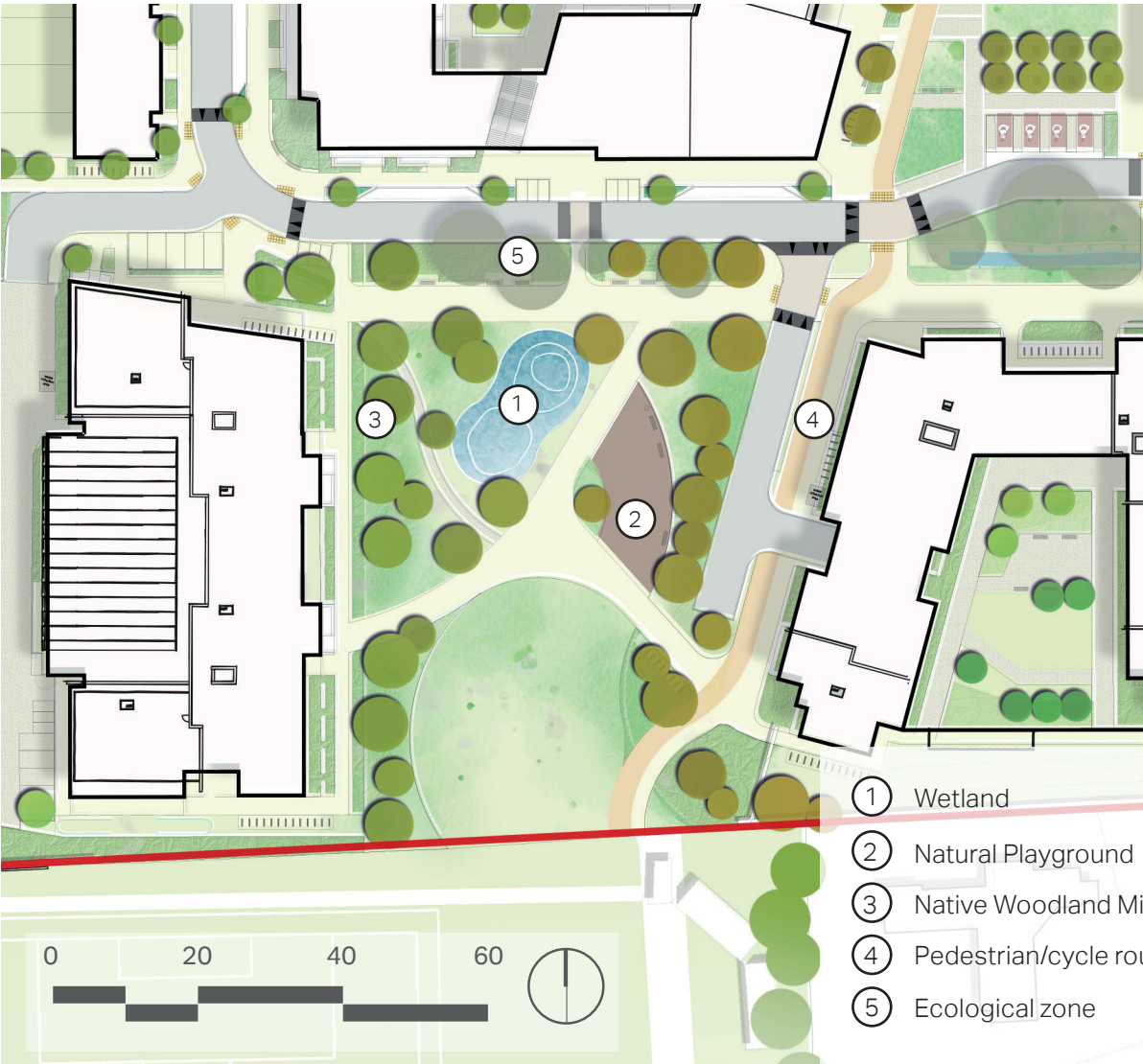
Central Square Photomontage (Macro Works CGI View 8)



Community Park

Community Park will provide an important gateway and connection into Rosemount Green. This park will be a welcoming environment to residents, the local community, and visitors. This park will be integrated with Rosemount Green, and seen as a natural extension of the green, encouraging greater use of both spaces. The existing boundary wall will be removed to provide visual connection to both open spaces. A cycleway and footpath will link both areas. This community park will provide a large children's natural play area, passive recreation open space and a integrated constructed wetland. The wetland will have a backdrop of native woodland continuing along the northern boundary of the park.

The park will be rich in biodiversity through these habitat creations. The arrangement of the park is designed to encourage exploration into the wider landscape, creating visual links to other areas and destinations, such as the hospital, central square and the walled garden.



Community park



Enriched Biodiversity



Passive Recreation



Large Natural Play Area



Integrated Constructed Wetland



Photomontage of Community Park (Macroworks)

Community Park Photomontage (Macro Works CGI View 9)



Walled Garden

The Walled Garden is one of the most important existing features on site. It provides an area of complete tranquillity within the site. The concept for this space is to create a Kitchen Garden, a place for the residents can grow vegetables. It can also be a place of education, and a destination for local school children and the local community, an area of relief from the surrounding environment. There may be the opportunity to link the Kitchen Garden with a cafe on site.

- ① Bioretention Zone/Open Space
- ② Edible landscape walled garden
- ③ Retained Existing mature trees
- ④ Existing drainage ditch retained
- ⑤ Courtyard link



Espalier fruit tree within walled garden



Kitchen garden orchard



Growing Food



Pathways providing easy accessibility



Photomontage of Walled Garden (Macroworks)

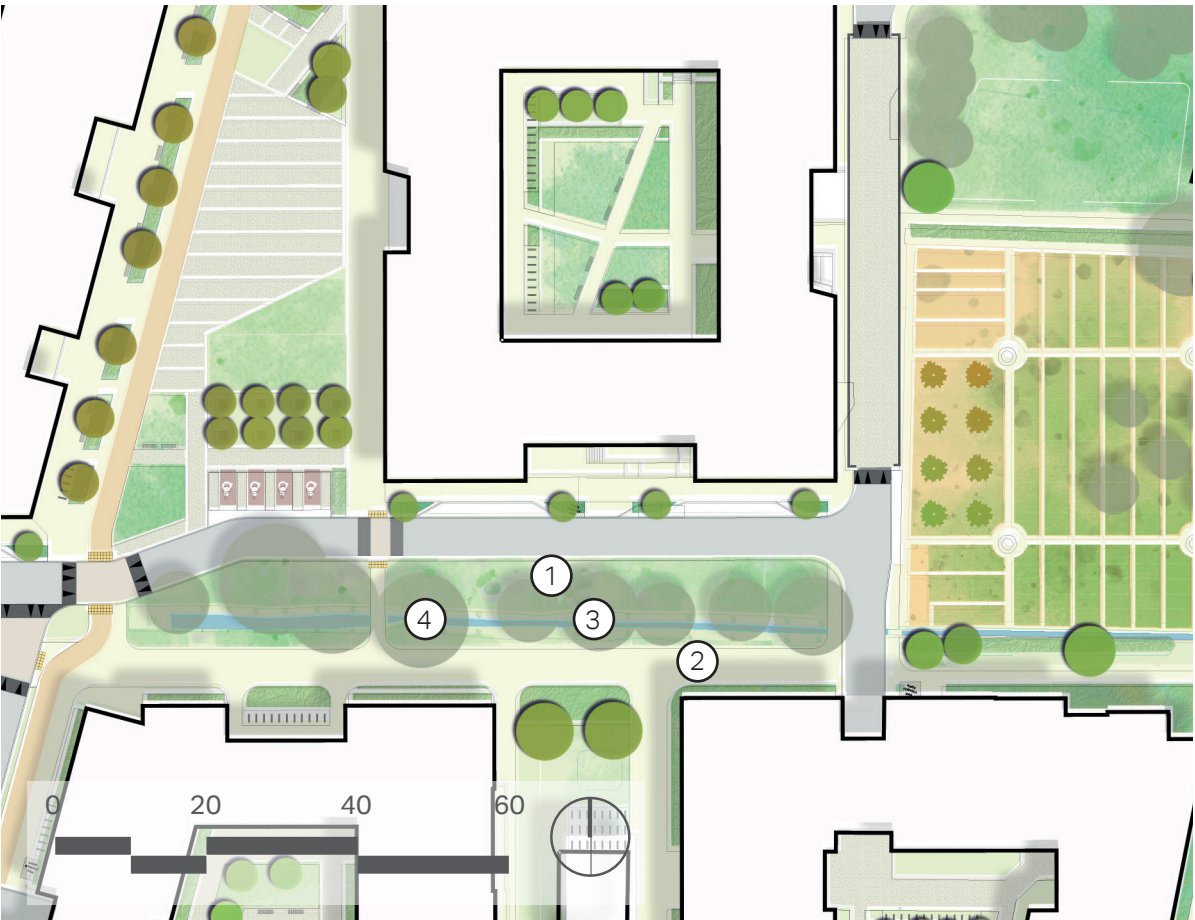
Walled Garden Photomontage (Macro Works CGI View 5)



Elm Park Eco-Corridor

The Elm Park Eco Corridor, will provide an important habitat corridor on site. The area already contains some semi-mature trees which will be retained, a ditch and some wet grassland areas. The area can be significantly improved, and the areas of wetland habitat increased which will benefit a wide variety of plant and animal species including bats. It will also be designed to provide educational tools/information which can be used by local school children as well as adults, to gain greater understanding of the natural world.

- ① Existing Trees
- ② Emergency Vehicle Access
- ③ Existing ditch modified to create miniature ponds
- ④ Wetland planting



Habitat managed landscape



Rain-water from building feed swale



Rain Garden and wildlife habitat

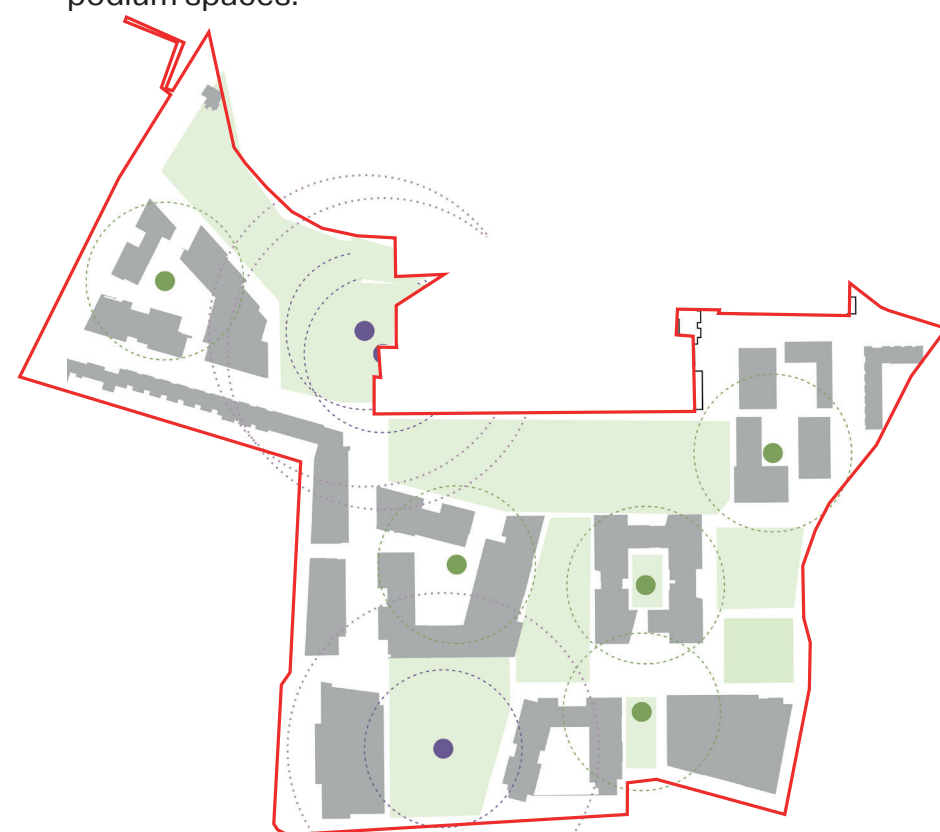


Rain Garden and wildlife habitat

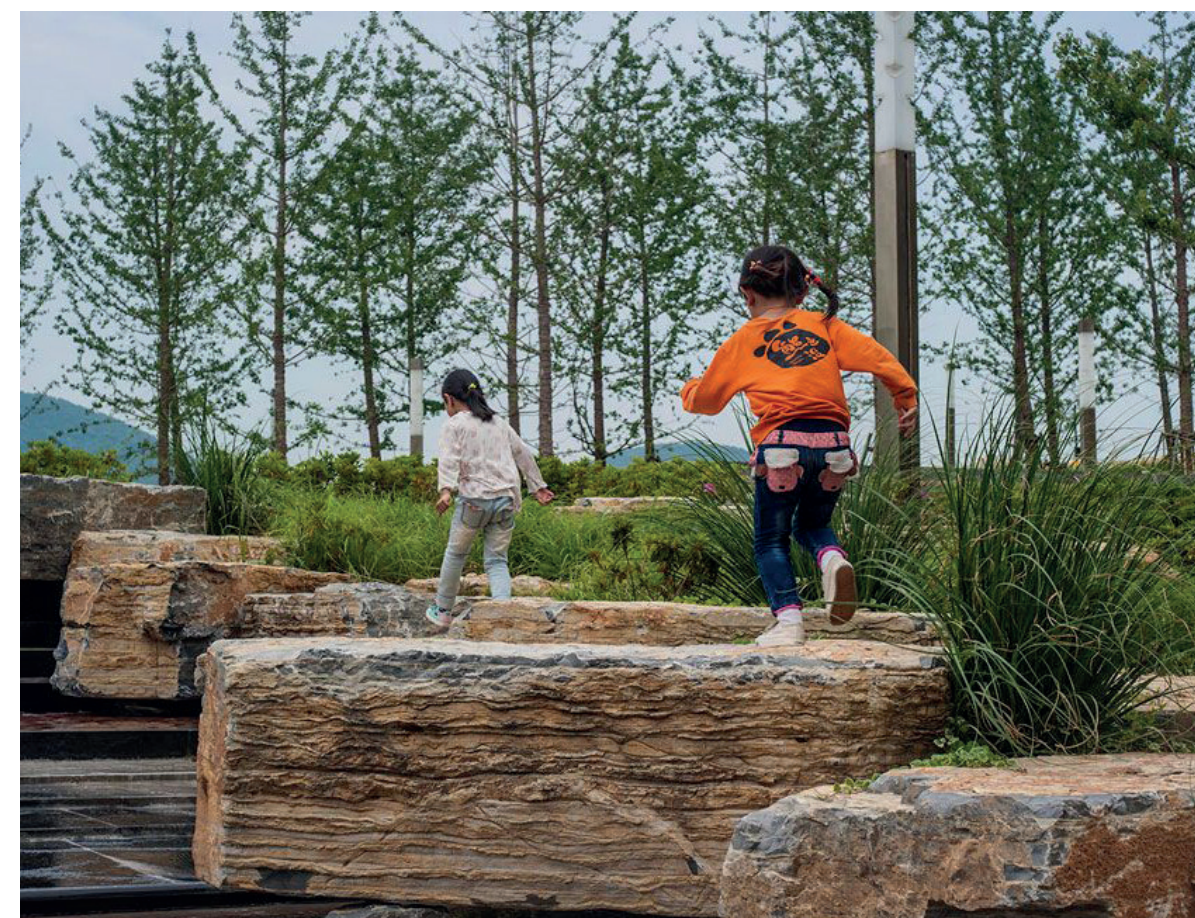
Play Spaces

Play provision will be an important and integral part of the development. The open space network that is proposed for Dundrum Central SHD will allow for a broad variety of play and play spaces. Differing materiality, scale, surrounding built form and content ensure that each play area caters for varying age groups and skills. Play spaces will be located so they are both convenient and easily accessible to both residents and visitors.

Demonstrated through the accompanying images, there will be a focus on natural play within the development. Designed to encourage exploration and imaginative play through the integration of play features and structures within the landscape to encourage interaction and exploration of the natural environment. There are two designated playgrounds located to the north of the site adjacent to the cycle track and in the community park south of the site. Local play opportunities occur in the semi-private podium spaces.



- Formal play spaces: 50 meters distance
- Formal play spaces: 100 meters distance
- Informal play spaces: 50 meters distance
- Informal play spaces: 100 meters distance



Podiums

Podiums are important spaces for residents as places to relax, play and enjoy outdoor space close to their homes. These spaces are especially important to provide universal access who may not have access to the larger open spaces on a day to day basis.

They provide important spaces where neighbours can meet one another and therefore enhance the sense of community within large developments as well providing environments which create habitats to support local wildlife.

Key Principles

- Privacy Buffer for Ground Floor Apartments
- Pedestrian Circulation
- Flexible Central Open Space
- Formal And Informal Play Opportunities
- Congregation And BBQ Opportunity
- Recreational Opportunities
- Communal Garden Opportunity
- Structural Planting with Seasonal Interest



Passive space enclosed by raised beds



Raised beds contain proposed tree planting.



Hardscaped open space



Privacy buffer to ground floor properties



Courtyard principles illustration

Dundrum SuDs Management Train

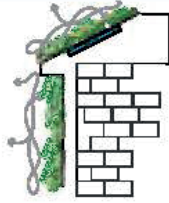
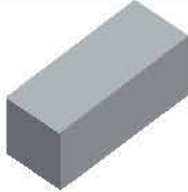






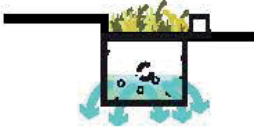



Dundrum SHD has a strong SuDs Management Train that collects, conveys and treats surface water through differing SuDs components through the development.

The figure adjacent highlights the proposal and the following pages outlines indicative site strategy.

SuDs Components

- Green Roofs
- Permeable Paving
- Bioretention Systems
- Existing Drains/Swales
- Raingardens
- Integrated Wetlands
- and Tree Planting





Collection

Type	Description	Setting	Required Area	Precedent	Symbol
 Green Roofs	A planted soil layer is constructed on the roof of a building to create a living surface. Water is stored in the soil layer and absorbed by vegetation.	 Building	Building integrated		
 Permeable Paving	Paving which allows water to soak through. Can be in the form of paving blocks with gaps between solid blocks or porous paving where water filters through the block itself. Water can be stored in the sub-base beneath or allowed to infiltrate into ground below.	 Street/Open Space	Water storage (underground or above ground)		
 BioRetention Systems	A vegetated area with gravel and sand layers below designed to channel, filter and cleanse water vertically. Water can infiltrate into the ground below or drain to a perforated pipe and be conveyed elsewhere. Bioretention systems can be integrated with tree-pits or gardens.	 Street/Open Space	Typically surface area is 5-10% of drained area with storage below.		

Conveyance

 Swales/Raingardens	Rain gardens are similar to swales in attributes but tend to be smaller in scale.	 Street/Open Space	Account for width to allow safe maintenance typically 2-3 metres wide		
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Treatment

 Integrated Constructed Wetland	Wetlands are shallow vegetated water bodies with a varying water level. Specially selected plant species are used to filter water. Water flows horizontally and is gradually treated before being discharged. Wetlands can be integrated with a natural or hardscape environment.	 Open Space	Typically 5-15% of drainage area to provide good treatment.		
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SUDs Strategy

The green infrastructure concept involves the planning, management and engineering of green spaces in order to provide specific benefits to society. It is a network of green spaces, habitats and ecosystems within a defined geographic area and comprises of wild, semi natural and developed environments.

The proposal seeks to create a positive receiving environment and access in conveyance of water surface run off, which creates a better sense of place and a more aesthetically pleasing landscape. Sustainable drainage systems slow down the flow of rainwater entering drainage systems, they filter out pollutants, immediately improving water quality and allow groundwater to recharge.

Designing streetscapes, green space and public realm with a sufficient green infrastructure strategy that works well during all seasons of the year can provide valuable community recreational space as well as important environmental infrastructure. The the following SUDs measures are incorporated into the scheme.



Bioretention Areas - grasses



Rain Garden - trees, shrubs and perennials



Integrated Constructed Wetland



Green Roof



Permeable Surfacing - paving/asphalt/resin

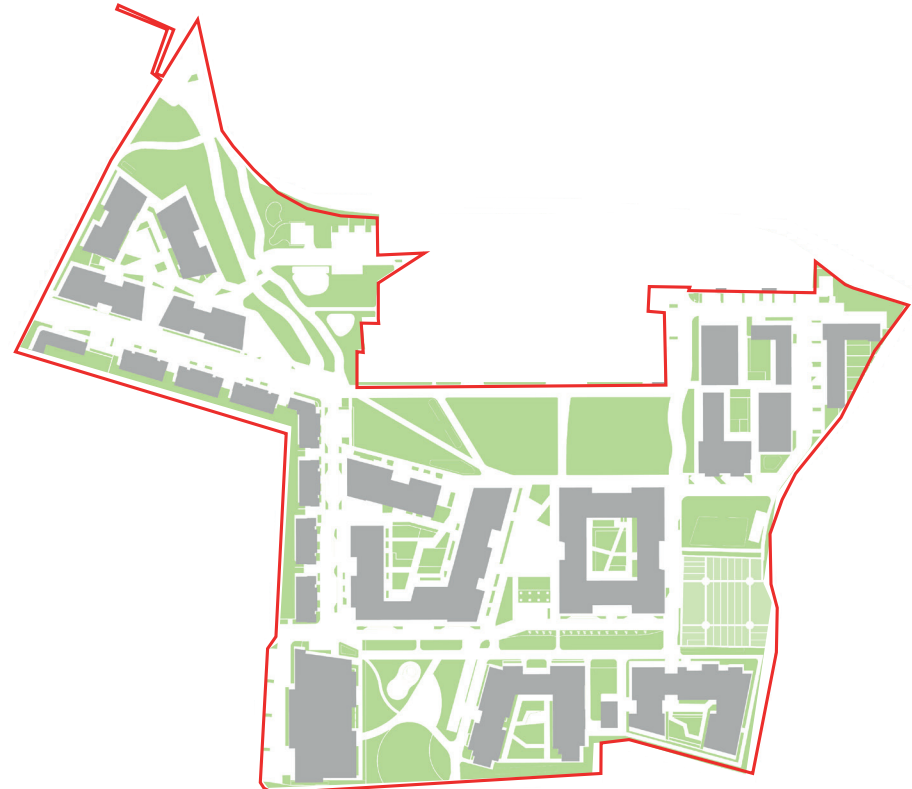
Environment Strategy

Habitat creation has been a key contribution to the landscape development proposal. The differing SuDs components have helped form a variety of inviting habitats through the development. Waters bodies and ponds are vital habitats for frogs, newts and a variety of insects including dragonflies.

The public open spaces through the development have native meadow planting as per the All Ireland National Pollinator Plan. Species rich grasslands provide habitats and food for insects and bees.

Other habitats that will be created through the open space will include:

- Open bonded brickwork within detailing of infrastructure buildings allowing for bat roosting,
- Bird and Mammalian nest boxes throughout the open public space,
- Log piles simulate fallen trees, and are valuable habitat for mosses, lichens and fungi, as well as many insects through the wetlands and extensive greenroofs; and
- Crushed aggregate pathways along secondary pathways allows water to permeate naturally through the soil, without the need for drainage channels and associated infrastructure.



Softscape Plan of SHD



Permeable gravel tertiary paths



Permeable gravel tertiary paths



Bat roosts within infrastructure buildings



Bird boxes within



Log piles for biodiversity

Intensive and Extensive Green Roofs

Green Roof Functions:

- Stormwater Management
- Recreation Opportunity
- Improved Biodiversity
- Aesthetic Improvement

The following sources have been used in the development of a Green Roof strategy that provides biodiversity and amenity spaces:

- The SUDS Manual, Ch 12: Green Roofs
- The GRO Green Roof Code (2021), UK
- Building Greener. Guidance on the use of green roofs, green walls and complementary features on buildings
- Green Roof Guidelines - Guidelines for the Planning, Construction and Maintenance of Green Roofs (2018).
- Creating Green Roofs for Invertebrates, Best Practice Guide
- Green Roofs Over Dublin
- Biodiversity: Climate Change Sectoral Adaption Plan. Prepared under the National Adaption Framework' (2019).

Environmental Benefits

Green roofs provide a social and environmental benefits to development projects. Green roofs assist in reducing the building's energy consumption providing additional insulation when used in conjunction with traditional insulation. Additionally, green roofs the heat island effect that takes place within cities.



Extensive Green Roof: Substrate and Structure

The Green Roof typology will be an extensive green roof and will be inaccessible to residents. It will primarily be a space for biodiversity and heat absorption. The biodiversity will be achieved through a variety of techniques to produce different habitats.

Substrate and Structure

Structure

Green roof structure must adhere to the criteria set out in BS EN 1990:2002 'Eurocode - Basis of Structural Design' particularly 'EN 1991 - Eurocode 1: Additions on structures.'

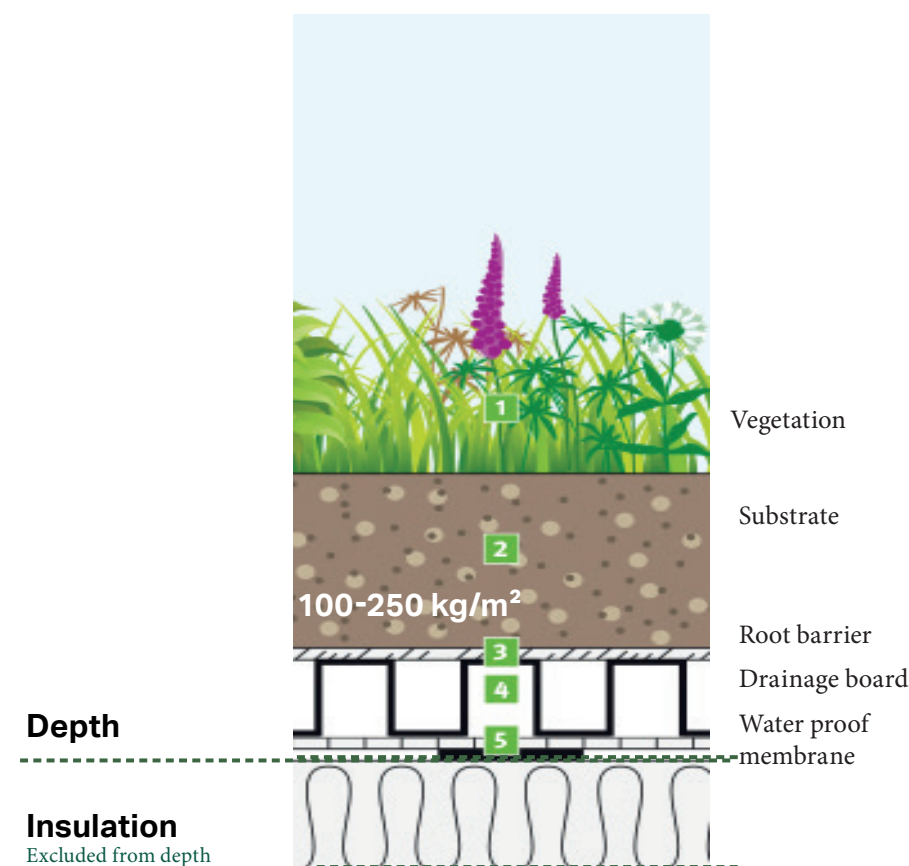
The depth of the soil will be an average of 115mm depth total with varying depths of soil up to 150mm thick.

Green roof substrate requirements:

- Light weight, no more than 20% organic content.
- Wind and water erosion resistant
- Promote plant anchorage due to risk of wind uplift
- Essentially free of weeds, diseases and contaminants.
- Peat free and fire resistant.
- Suitable water permeability, retention and release.
- Adequate air porosity and resistance to compaction to prevent root damage.
- Not contain sharp points that would damage the water proof layer.

Origin and composition to be used:

- Green roof substrates must be tested according to BS8616:2019 or equivalent.
- Green roof substrates must be supplied within the Republic of Ireland or within the EU.
- Extensive green roof has a lower nutrient requirement.
- Can contain recycled aggregates.



Green roof substrate cross section



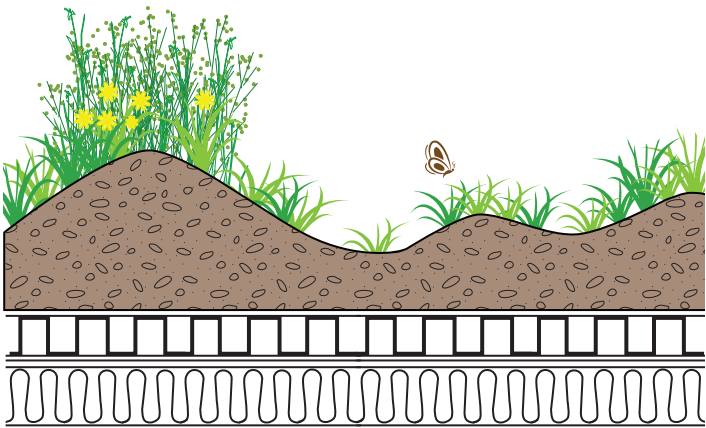
Self seeded brown roof - Laban data centre



Extensive green roof - Swarthmore College

Extensive Green Roof - Habitat Creation

Habitat techniques and types



Varying substrate depths

Varying depths of substrate allow for a wider range of species to grow.

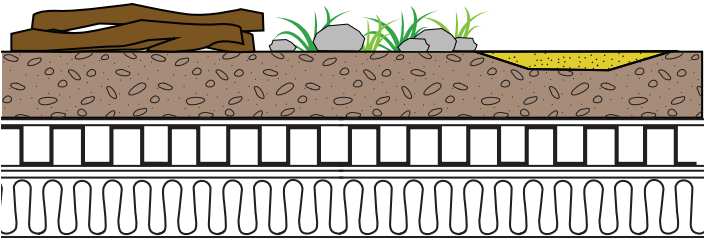
- Among the peaks and valleys of the soil micro climates are created
- Shaded areas provide shelter during peak temperatures
- Encourages variation different species as the soil depth requirements for roots varies.



Mounds allowing for a variety of wildflowers and shrubs.



Undulating Green roof that has a variety of soil depths.



Additional Materials

Providing additional materials such as sand pockets, coarse gravel beds and deadwood piles allows a variety of species to create habitats.

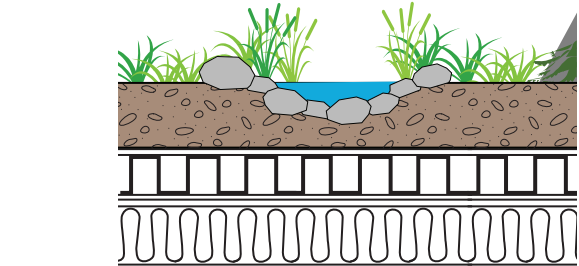
- Sand pockets act as a sun trap, shelter space and breeding ground for burrowing insects.
- Deadwood piles provide a habitat for flora such as lichens, fungi and moss as well as a structural space for insects such as beetles, bees and ants. This can also be mimicked with insect hotels and bee hives. Dead plant stems also support invertebrate life.
- Gravel and boulders provides another habitat type for plants and animals to occupy. Boulders absorb and radiates heat. Gravel allows self-vegetation from the wind.



Log piles and gravel providing a habitats.



Unvegetated sand pockets surrounded by gravel.



Shade and water saturation conditions

Shade and water saturation can allow for different species to thrive on green roof environments.

- Water bodies that retain rain water for extended periods of time provides a water source for fauna living on the roof as well as a habitat for species that prefer water saturated soils mimicking wetland conditions.
- On green roofs at the top of buildings shade can be scarce, providing shaded spaces allows for plants that prefer partial sunlight or shade to grow further contributing to biodiversity. Biosolar roofs achieve this with solar panels when installed at an angle, at a height and an adequate distance from each other to allow for some sunlight and water to reach the plants.



Water saturation on the green roof mimicking pond.

Extensive Green Roof-Proposed Meadow Mat

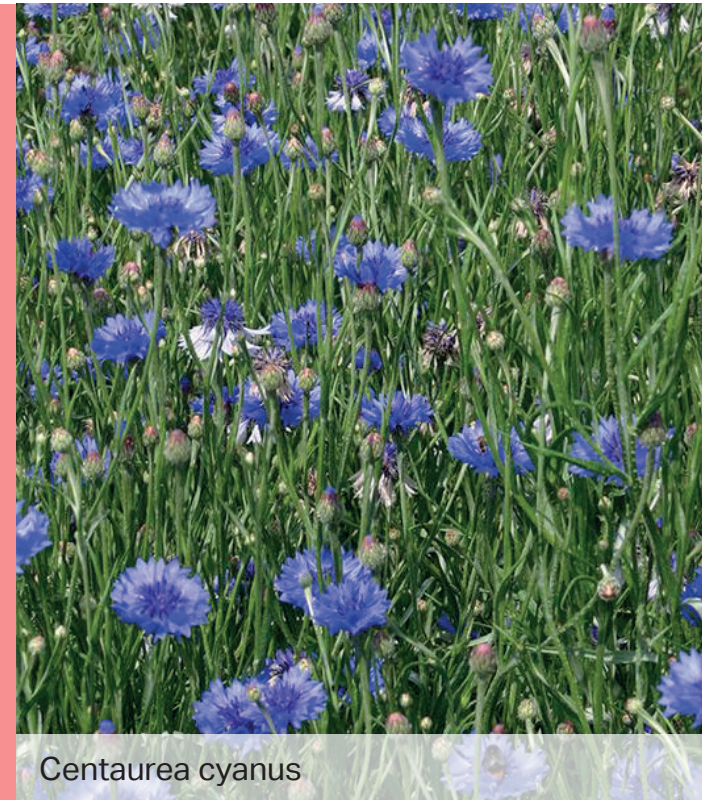
The Green Roof typology is focused on biodiversity as such there will be different species mixes for different conditions and follow the GRO Code by containing 15 species and a range of flowering species;

Wildflower meadow mat (100mm soil depth)
Species
<i>Anchillea millefolium</i>
<i>Anthemis arvenis</i>
<i>Centaurea cyanus</i>
<i>Centaurea nigra</i>
<i>Galium verum</i>
<i>Leontodon autumnalis</i>
<i>Linaria vulgaris</i>
<i>Lotus corniculatus</i>
<i>Rhinanthus minor</i>
<i>Rumex acetosella</i>
<i>Saponaria officinalis</i>
<i>Scorzoneroideis autumnalis</i>
<i>Silene flos-cuculi</i>
<i>Thymus polytrichus</i>
<i>Veronica officinalis</i>
<i>Vicia sativa segetalis</i>
<i>Viola tricolour</i>

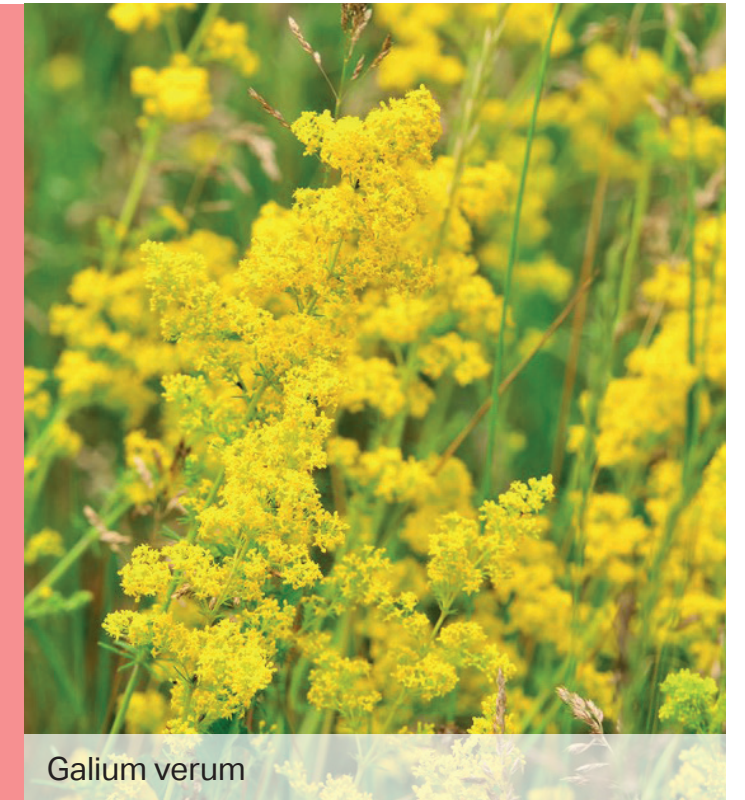
Wildflower Mat



Achillea millefolium



Centaurea cyanus



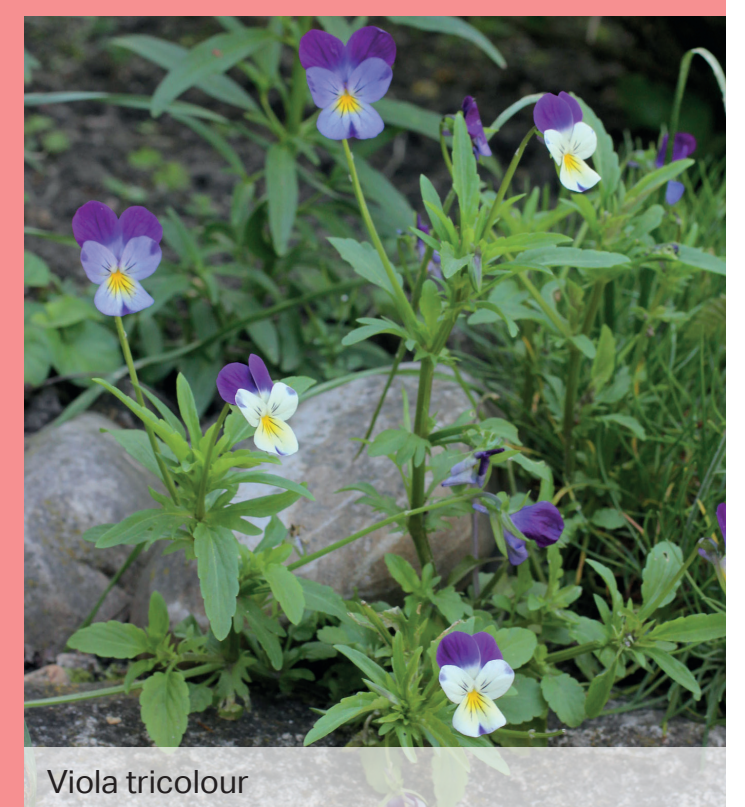
Galium verum



Rumex acetosella



Silene flos-cuculi



Viola tricolour

Extensive Green Roof - Maintenance

Extensive Green Roof Maintenance

General Maintenance

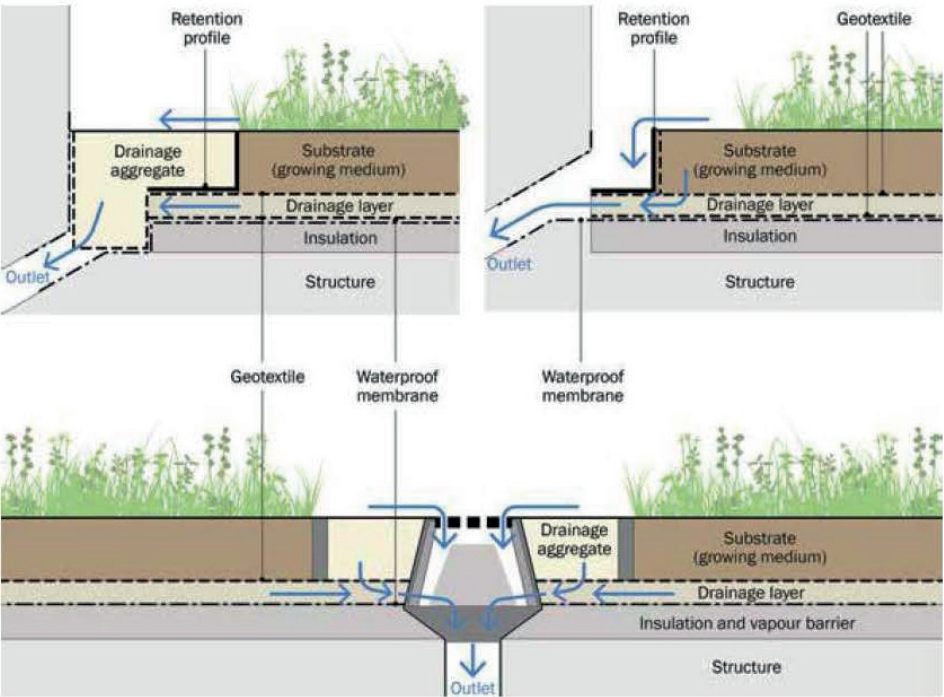
During installation of the green roof and during extended periods without rainfall green roofs will need to be watered every 6 weeks. Irrigation systems should be in line with BS 7562-3:1995 “Planning, design and installation of irrigation schemes - Part 3: Guide to irrigation water requirements.” Remote monitoring systems can be used to observe any maintenance needed.

Water Bodies Maintenance

Wetland green roofs or greens roofs with waterbodies will require maintenance including, monitor accumulation and remove invasive species periodically. Water depths should be design to be kept under 30cm. An irrigation pump can be used to maintain water levels which will need to be cleared of vegetation and tree seeds.

Shaded Areas Maintenance

Maintenance carried out biannually, during the spring and autumn, removal of leaf litter, remove weeds, cut wildflowers to a height of 50-70mm, apply slow release organic fertiliser in the spring if needed.



Drainage systems for an extensive green roof.



Safety and Systems

Safety and Access

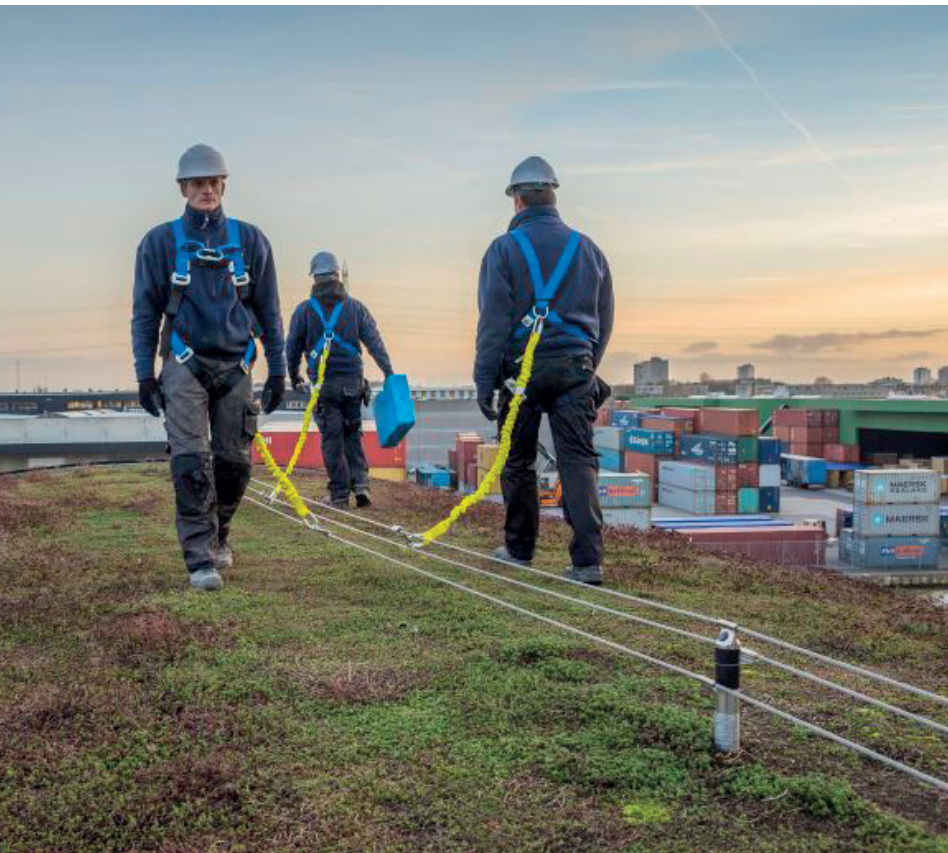
Teams carrying out green roof maintenance should be the only ones accessing the extensive green roof. Their safety must be ensured through both/either a 1.1m minimum upstand around the perimeter of the roof measured from the top of the substrate surface or fall arrest/restraint systems.

Fire safety

Fire breaks are required, 300mm width around parameters and outlets and 500mm around openings such as doors and windows. Material for fire breaks include 20-50mm size rounded pebbles at least 50mm deep over a drainage board or concrete paving stone. These breaks need to be maintained and cleared of vegetation. Seasonal clearing of wildflowers and tall grasses will be required to reduce fire risk and alter the structure and weight of the green substrate.

Drainage systems

Drainage systems for green roofs must adhere to BS EN 12056-3:2000, Gravity Drainage systems inside buildings and BS 6229:2019, Flat roofs with continuously supported flexible waterproof coverings.



Fall arrest system for the safety of maintenance people.

Intensive Green Roof: Substrate and Structure

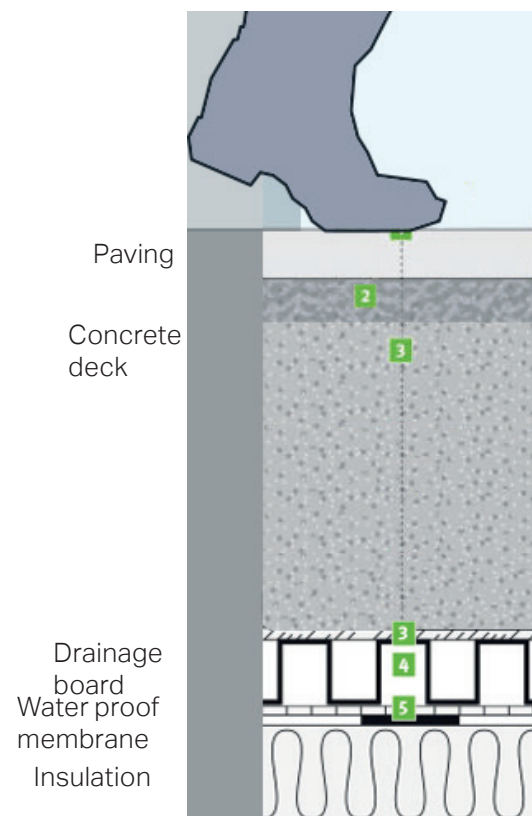
Blue roofs on this project are intensive green roofs, these shared spaces will be used for amenity and will therefore have a higher capacity to retain water contributing to the SUDS network onsite and reducing flood risk. SUDS also improves the water quality of water by allowing contaminants in surface water to be broken down, absorbed and their movement restricted by plants. SUDS methodology for reducing surface run off, the lag time between peak rainfall and peak discharge and removal of pollution is supported by the Water Framework Directive (2000).

Substrate and Structure

Structure

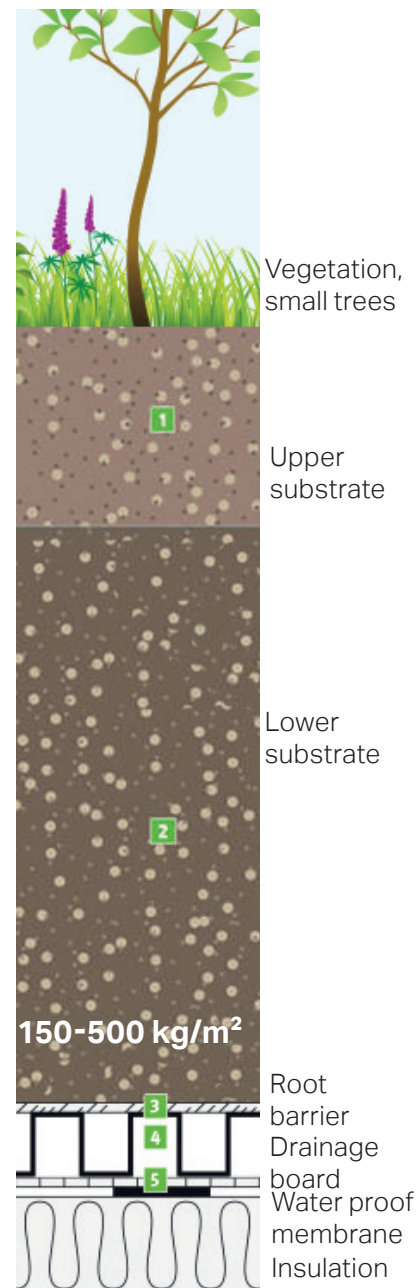
Green roof structure must adhere to the criteria set out in BS EN 1990:2002 'Eurocode - Basis of Structural Design' particularly 'EN 1991 - Eurocode 1: Additions on structures.'

The flat roof will act as a roof garden having a mixture of hardscape and softscape. A concrete deck will allow for higher loading, a greater depth of soil to be used for shrub and tree planting in planters on the roof podiums.



Origin and composition of soils/compost to be used:

- Green roof substrates must be tested according to BS8616:2019 or equivalent.
- The upper substrate will be 350-400mm thick and intensive roofs require a higher amount of nutrients to support larger plants.
- The lower substrate will be at least 250mm thick and acts as a drainage layer, less organic matter is needed.



Intensive green roof- Magnetan sensory garden green roof



Intensive green roof - Dickens Yard apartments roof garden

Intensive Green Roof: Biodiverse Habitat Creation-Planting Schedule

Courtyard/Podium Trees				
Species		Girth	Clear Stem	Height
Amelanchier lamarckii 'Robin Hill'		18-20 cm	2.0m	min. 450cm
Acer palmatum 'Osakasuki'		18-20 cm	2.0m	min. 450cm
Malus 'Evereste'		18-20 cm	2.0m	min. 450cm
Shrub and Ground Cover Mix 2 (Intensive Green Roof Planting)				
Species	Designation	Root Type	Height mm	Spread mm
Pennisetum hamelin	Container Grown	2l	200-300	200-300
Ilex crenata	Container Grown	2l	200-300	200-300
Fatsis japonica	Container Grown	2l	300-500	300-500
Euonymus fortunei 'Emerald Gaiety'	Container Grown	2l	300-500	300-500
Sarocococca hookeriana	Container Grown	2l	100-200	200-300
Pittosporum setiferum	Container Grown	2l	200-300	200-300
Tiarella cordifolia	Container Grown	2l	200-300	200-300
Carex oshimensis 'Everest'	Container Grown	2l	200-300	300-500
Allium Sensation	Bulbs handsown planting 9 per m2			
Muscari	Bulb handsown, planting 9 per m2.			



Pennisetum hameln



Iberis sempervirens



Ilex crenata



Pittosporum



Amelanchier lamarckii 'Robin Hill'



Malus 'Evereste'



Acer palmatum



Carex oshimensis everest



Allium

Intergrated Constructed Wetland

Integrated Constructed Wetland (ICW)

An 'Integrated Constructed Wetland' (ICW) is a series of shallow, interconnected, emergent-vegetated, surface-flow wetland compartments that receive/intercept waterflows from a variety of sources. ICW systems are distinguished from traditional 'treatment wetlands' by the integration of water flow and quality management with that of landscape-fit and biodiversity enhancement

Design features should include a safe exceedance route, maintenance access to all areas of the pond, a flat safety bench around the perimeter of the pond.

The ICW (Integrated Constructed Wetland) proposed in the Dundrum scheme aims to create a biodiverse habitat on site. Native woodland planting will be the backdrop of the wetland in the community park. This comprises of a native mix of transplants, standards and semi mature trees and marks a continuation of the Eco Corridor east of the community park. A mix of bird boxes will be placed on the semi mature trees to encourage biodiversity. Adaptive/Native plug and seeding for the wetland will provide a rich biodiversity when developed. This location will be wildlife haven for the whole community to enjoy.

The following pages outline the proposed creation and formation of the wetland for Dundrum.



Native tree planting



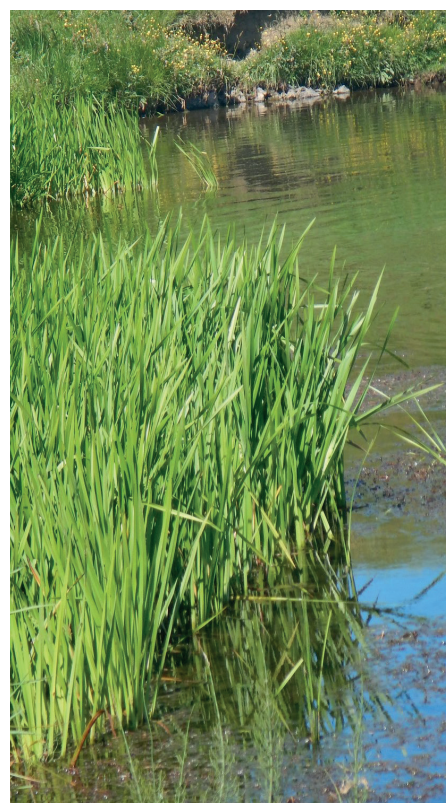
Bird Boxes



Lythrum salicaria



iris pseudacorus



Sparganium erectum



Schoenoplectus lacustris



Glyceria maxima



Butomus umbellatus



Carex paniculata

Wetland Benches: Enhanced Biodiversity Habitat Creation

Habitat , Formation & Planting

Habitat and Formation

The design of wetlands should consider the inclusion of several zones:

- Permanent pool - This is the permanent volume of water that will remain in the pond/wetland throughout the year (less any evaporation and infiltration during extended periods of dry weather). The pool acts as the main treatment zone and helps to protect fine deposited sediments from re-suspension.
- Aquatic bench - This is the zone of shallow water along the edge of the permanent pool that supports wetland planting, acting as a biological filter and providing ecology, amenity, and safety benefits. Where the proportion of planting is increased (ie to create wetland features), there may be other "islands" (zones of shallow, vegetated areas) within the permanent pool.
- Attenuation storage volume/Emergent zone - This is the temporary storage volume above the permanent pool that fills as water levels rise during rainfall events, providing the required flow attenuation.

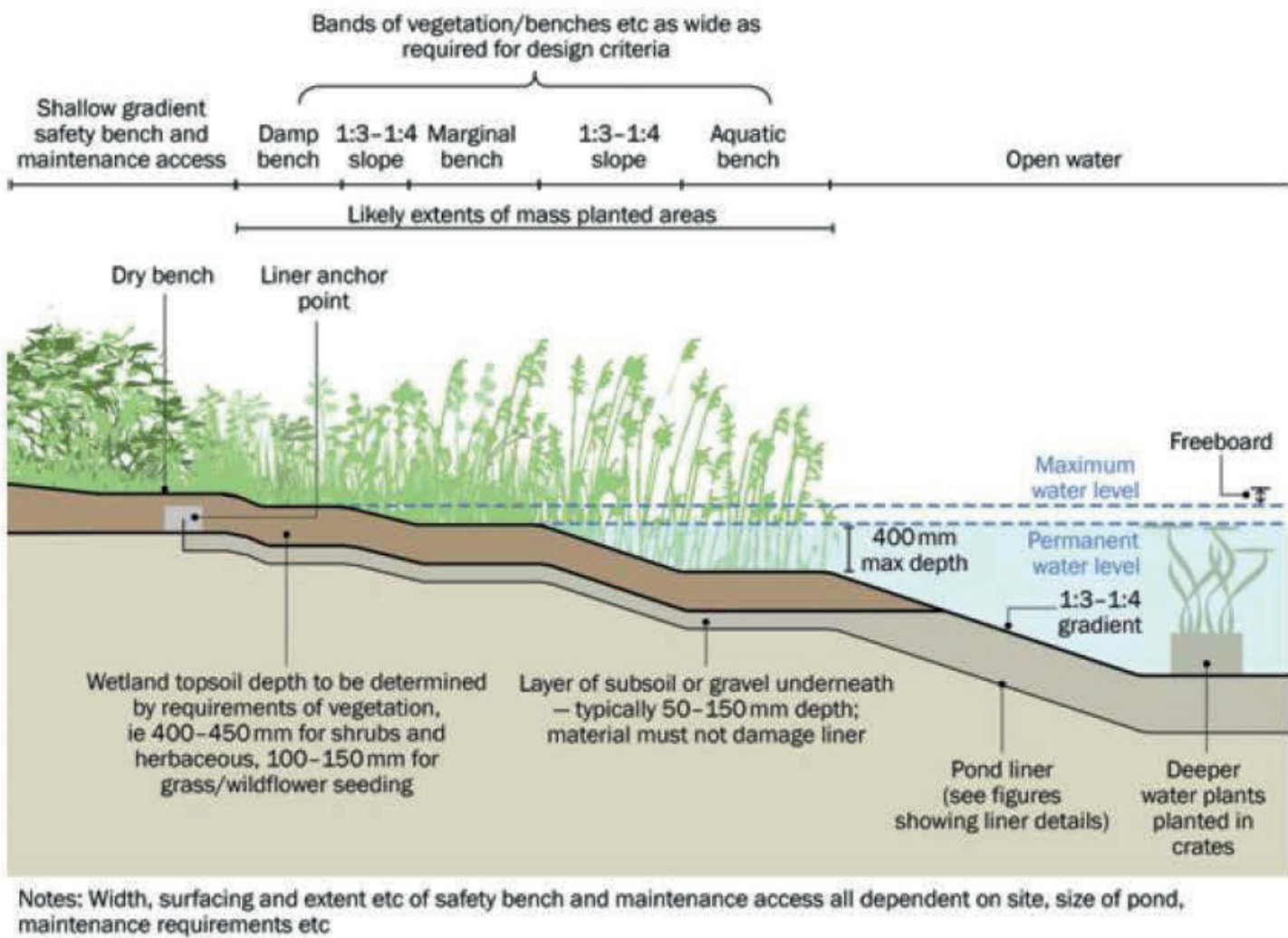


Figure 23.5 Typical planted pond edge details

Planting

Native/adaptive planting have been specified for the three differing benches in the wetland. Invasive species such as *Typha* spp. have been omitted from the proposal.

A wetland native seed mix is to be sown alongside the proposed plug planting providing a matrix of diverse plants for the area.

Wetland planting should take place between early April and mid-June, so the plants have a full growing season to develop root reserves they need to survive the winter. Vegetation ideally needs to be established as soon as possible to prevent bankside erosion.

The soils of a pond buffer are often severely compacted during constructions. To mitigate this, it is advisable to excavate large and deep holes around the proposed planting areas and backfill these with uncompacted topsoil. 300mm depth of good quality topsoil is acceptable for proposed plug planting of the wetland.

Wetland Planting			
Species	Type	Plants per sq. m	Mix %
Emergent Aquatic Planting			
<i>Glyceria Maxima</i>	Plug, P9	7	50
<i>Sparganium erectum</i>	Plug, P9	7	30
<i>Schoenplectus lacustris</i>	Plug, P9	9	20
Emergent Planting			
<i>Lythrum salicaria</i>	Plug, P9	13	40
<i>Iris pseudocarus</i>	Plug, P10	13	40
<i>Butomus umbellatus</i>	Plug, P9	13	20
Dry Meadow			
<i>Carex panuiculata</i>	Plug, P9	13	50
<i>Filipendula ulmaria</i>	Plug, P9	13	50
Seeding			
Native Wetland/Pond Edge Seed Mix Reference Code: EC05 -Design by Nature			

Intergrated Constructed Wetland: Formation

A membrane and geotextile shall be laid underneath the wetland to form ponding. Refer to CIRIA, SuDs Manual 2015 figure adjacent and below requirements.

Liner/Membrane & Geotextile:

Single layer robust welded flexible membrane, suitable for waterproofing to structures and for water containment.

Before laying check that substrate surfaces are :-

- a) Structurally sound.
- b) Free from ridges and undulations.
- c) Surface dry.
- d) Cleaned of loose and extraneous material.

Before laying check that construction allows membrane continuity to be maintained.

Membrane to be installed by qualified operatives recommended by membrane manufacturer and/or prefabricated into panels where appropriate to suit site requirements. Laid strictly in accordance with manufacturers' recommendations.

All penetrations through the membrane shall be sealed with proprietary water-resistant preformed cloaks. The cloaks shall be compatible with the membrane and approved by The Engineer.

A geotextile will be used in the system to protect liners and act as filters. It shall be laid continuously and have overlaps of a minimum 300mm.

Saftey

A 1.1m timber post and panel fence will be erected along the emergent bench of the wetland protecting against anyone submerging into the pond whilst planting is establishing. Once planting has formed this fence will not be visible

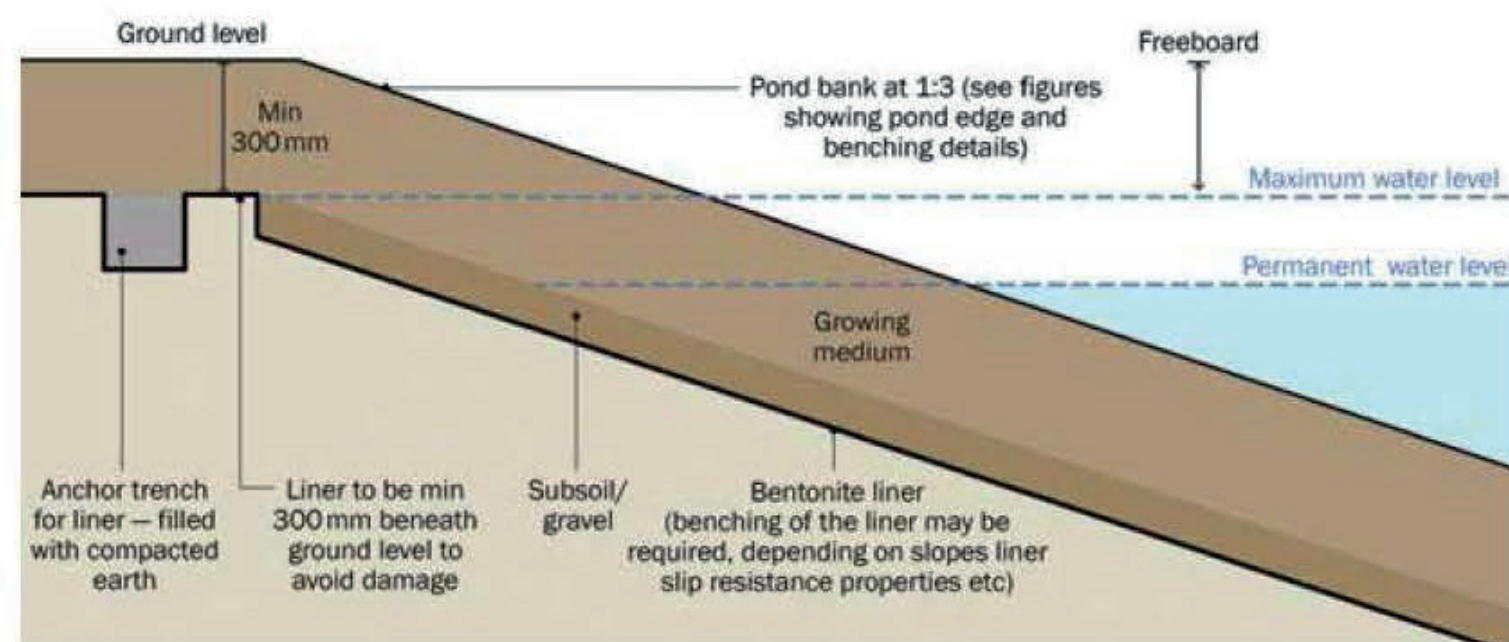


Figure 23.13 Details for a typical geosynthetic liner

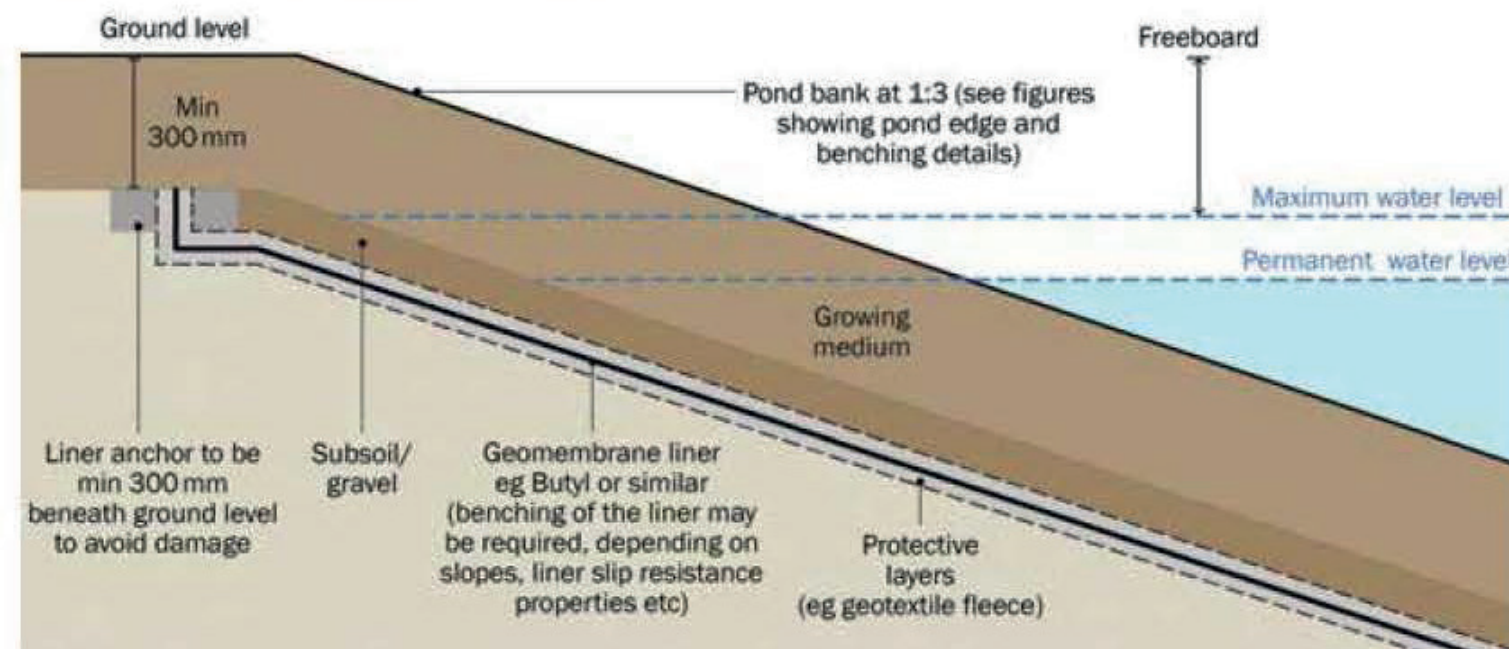


Figure 23.14 Details for a typical geomembrane liner

Raingardens/Bioretention Pits

What is a Raingarden/Bioretention Pit?

Raingardens are shallow landscape depressions that reduce rainfall runoff and mitigate the impact of pollution.

They will enhance the capacity of the surface water drainage network by capturing and storing rainfall, allowing it to soak into the ground slowly. (Refer to Engineers Surface Water Drawings for Reference).

Raingardens are flexible in design and are excellent examples of how SuDs components can be integrated into streetscape without negatively impacting the primary function of streets and spaces.

The performance of a raingarden can be enhanced by engineering the subbase to include a gravel layer that helps filter pollutants and provides more storage capacity for rainwater.

These are often referred to as 'Bioretention Systems' and are proposed along the streetscape of Dundrum SHD as part of then overall SuDs Management Train for the development.

Please refer to the figure highlighting a typical plan of this component in a streetscape from the CIRiA, SuDs Manual 2015.

Planting proposed in the areas is a mixture of structure grass, fern and perennial planting that do well under these conditions which providing a biodiverse habitat to the street. Please refer to the planting schedule adjacent

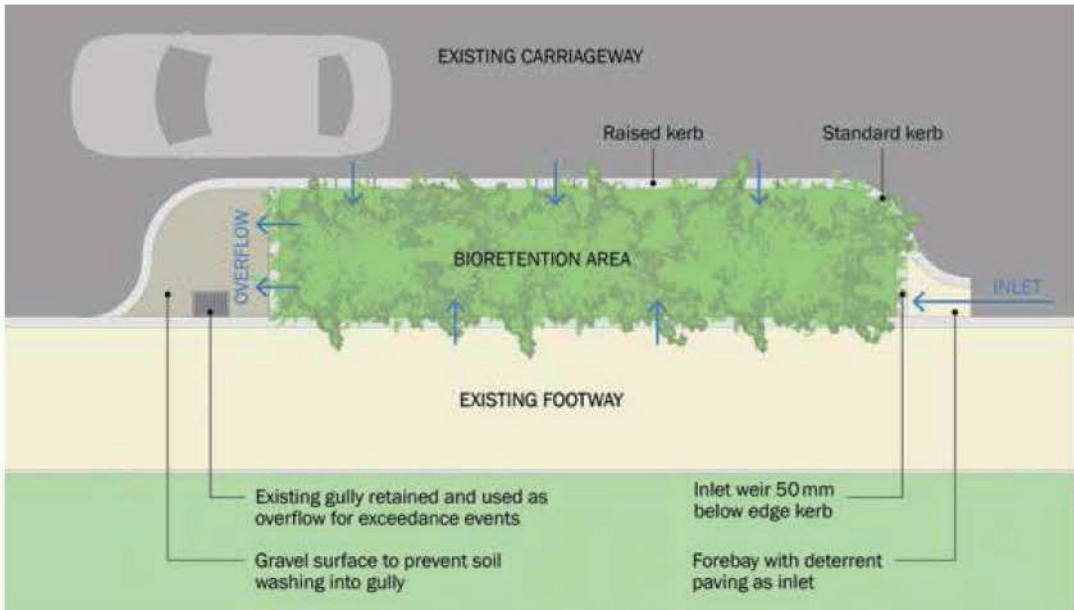


Figure 10.11 Example of a bioretention system upstream of an existing gully (after Illman Young/EPG Limited)

Rain Garden Mix				
Species	Designation	Root	Height mm	Spread mm
<i>Carex pendula</i>	Container Grown	2l	200 - 300	200 - 300
<i>Calamagrotis acutiflora 'Karl Foerster'</i>	Container Grown	2l	200 - 300	200 - 300
<i>Dryopteris felix mas</i>	Container Grown	2l	200 - 300	200 - 300
<i>Aster ageratoides "Stardust"</i>	Container Grown	2l	300-400	300-400
<i>Aster thomsonii</i>	Container Grown	2l	100 - 500	100 - 500
<i>Liatris spicata</i>	Container Grown	2l	300-400	300-400
<i>Perovskia atriplicifolia</i>	Container Grown	2l	1000 - 1500	500-1000
<i>Carex oshimensis "Everest"</i>	Container Grown	2l	200 - 300	200 - 300
<i>Echinacea purpurea</i>	Container Grown	2l	300-400	300-400
<i>Nepeta 'Six Hills Giant'</i>	Container Grown	2l	200 - 300	200 - 300
<i>Salvia nemorosa "Iubecca"</i>	Container Grown	2l	100 - 500	100 - 500

Cycle Parking Provision

Cycling Parking Provision

A variety of cycling infrastructure is proposed for the site. Stacked multi-level bike racks within secure storage units in the curtilage of development blocks will provide the majority of cycle parking for residents of the multi-storey apartment blocks.

Secure on street bike racks are proposed for the on street residences, in order to avoid cycle parking within homes, and generous on-street cycle parking will be provided for visitors to the site in well lit overlooked spaces.

A dedicated cycle lane through the site improves connectivity and cycle infrastructure within the Dundrum / Windy Arbor area, encouraging connectivity through the site and promoting sustainable forms of transport.

Please refer to the transport report outlining quantities of parking proposed alongside the corresponding figure adjacent.

General Principles

Please refer to indicative figure highlighting the non residential locations for bicycle parking locations.

- Cycling parking is to be convenient, accessible and sited close to principle destinations.
- Cycle parking is to be distributed throughout the site in well-lit locations with passive surveillance.
- Cycle stands will not be sited sideways on sloping ground greater than 2%.

All proposed cycle infrastructure and furniture are to follow;

- Cycling Policy-Smarter Travel, Better Living, DLRCoCo
- County Development Plan 2022-2028. Chapter 12, DLRCoCo
- Standards for Cycle Parking and associated Cycling Facilities for New Developments, DLRCoCo
- National Cycle Manual, NTA



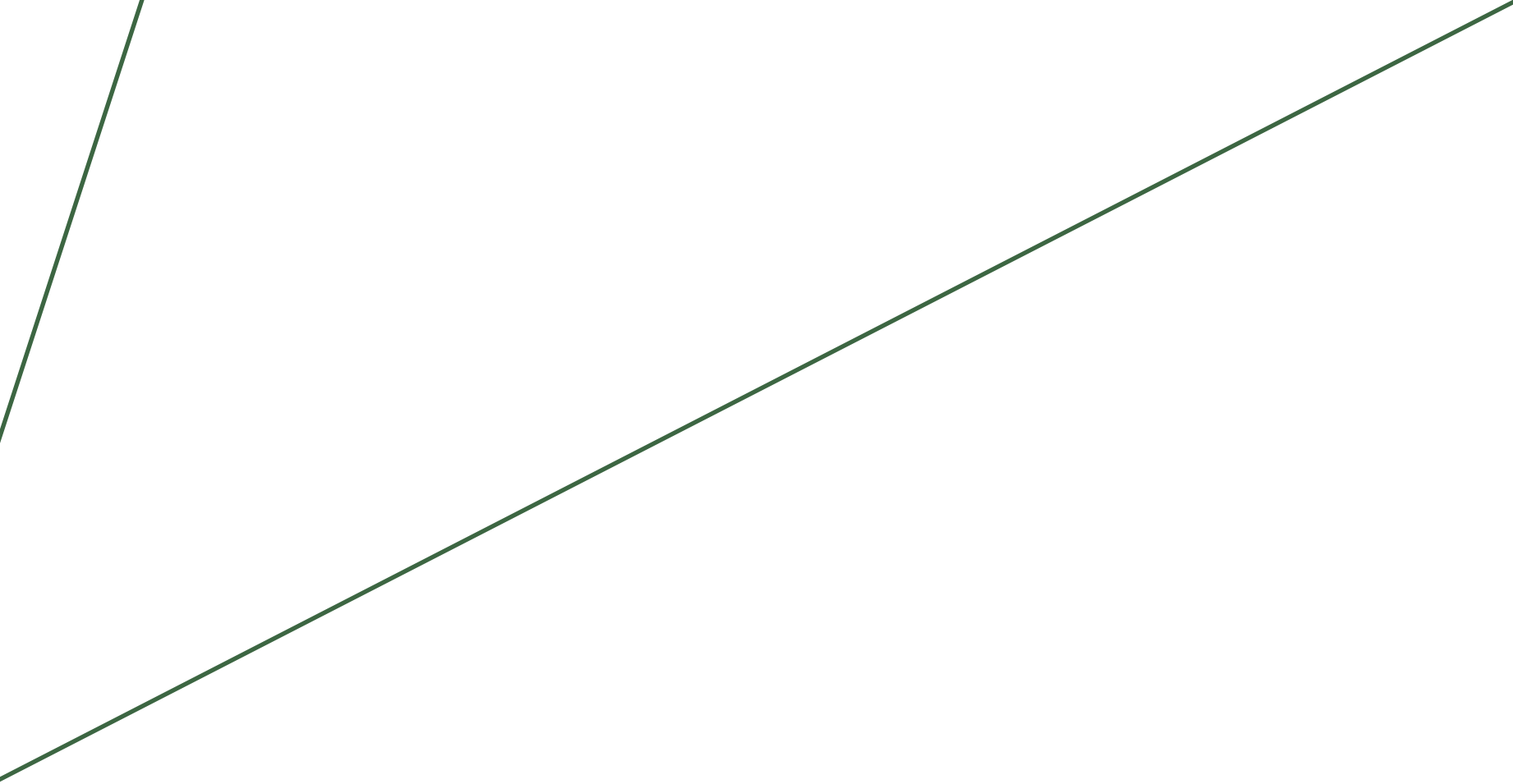
Indicative Bicycle Storage Proposed



Materiality

03





Soft Landscaping

The following sources have been used in the development of a suitable planting scheme that combines the overall design intent with a diverse planting palette to achieve a rich and sustainable softscape programme:

- Dún Laoghaire-Rathdown County Council(DLR) Development Plan 2016-2022
- DLR Trees, A tree strategy for Dún Laoghaire-Rathdown 2011-2015
- All-Ireland Pollinator Plan 2015-2020
- National Biodiversity Action Plan 2017-2021

The landscape architecture proposal aims to create a diverse planting scheme that contributes to the overall biodiversity within the development and the wider area. Plant species have been selected with direct reference to the 'All-Ireland Pollinator Plan 2015-2020' and the approach aims to align with the specific policies and objectives as set out in both the Dún Laoghaire-Rathdown Development Plan 2016-2022 and Future draft development plan 2022-2028.

The overall planting approach is focused on creating a rich and biodiverse planting footprint in the context of a significant re-development of the site. The removal of existing hedgerows and grassland is offset by the addition of pollinator friendly wildflower meadows, tree planting and mixed native woodland along the Eco Corridor and in the community park south of the site. All retained tree and hedgerow protection measures will be in accordance with the mitigation recommendations prescribed in the ecologists and arborist report.

A variety of open space and softworks currently exists on the site. These elements function as part of the overall green framework of the site, providing a hierarchy of space that is not only visual aesthetic but provides opportunities for rest and recreation.

Softworks Palette

A variety of open space and softworks currently exists on the site. These elements function as part of the green space, provide visual aesthetic as well as offering opportunities for rest and recreation.

The existing site offers a variety of softworks elements which have been categorised into 6 groups, Specimen Trees, Street Trees, Shrubs and Underplanting, Meadow and Wild Areas, Amenity Lawn and Wetland Areas.

Combined, these elements provide an open space network which defines the existing site and assets which have potential to be include within the proposals on site.



Existing condition of trees on site

Open Spaces and Street trees

High quality mature open space trees on site will be retained which outline the entrance avenue and historic parkland. Proposed native/adaptive tree planting will further enhance the open space in the development. Streets where appropriate will be lined with trees columnar/fastigate in form which all have a clear stem height of 2m.



Street trees within pavement

Bioretention systems/Raingardens

Bioretention systems will collect excess surface run off whilst providing a key biodiversity to the streetscape and open space. Species proposed will tolerate fluctuating soil moisture.



Roadside swale and tree planting

Shrubs and Underplanting

A distinctive palette of underplanting will be proposed on site. Structured planting in front of proposed dwellings and ground floor apartments will provide a soft transition from public to private space. Species have been chosen to enhance biodiversity whilst providing structure and being easily maintainable.



Shrub and underplanting

Amenity Lawn

Amenity lawns make up a large portion of the open space on site and provides residents of the site the opportunity for rest and recreation.



Amenity lawn

Meadow and Wild Areas

Wild areas and verges which are left to grow are increasingly popular aesthetically but importantly due to their benefits to biodiversity and lower maintenance costs. These areas will be located through the open spaces, transitioning from amenity lawn verges along pathway edges to meadow areas in passive open space zones.



Meadow planting

Wetland Areas

There are a number of wet areas and ditches on site, and proposals for an integrated constructed wetland at the community park. These areas have the potential to form important habitats for local wildlife, and educational tools for local children.



Wetland meadow planting

Proposed Tree Planting Species

Tree Strategy

The general planting strategy throughout the scheme is for significant structure tree planting with 2 metre clear stems to provide a leafy canopy layer, softening the proposed buildings and a base layer of low shrub/ groundcover and hedge planting to create low level seasonal interest and colour softening the hard surfaced areas and car parking. Eye level between the two planting types is kept clear to maintain sight lines throughout the scheme.

Native and naturalised tree species are to be planted within the public open space to increase opportunities for native wildlife. These will ultimately be large scale trees to designate a parkland character.

Street tree planting will consist of species with fastigiate or neat forms suitable to the scale of the streetscape and those which will thrive in a streetscape environment. Street tree planting is located to avoid impacts with street lighting. Street trees will be planted into a minimum of 7cu.m. topsoil, with the use of urban tree soils, root barriers to protect water utilities and topsoil loaded rootcells to increase rooting areas outside the main tree pit area as necessary.

Courtyard/Podium trees have been chosen for seasonal diversity and small form. They will be planted in raised beds in the podium developments.

Private garden dwellings have a fruit tree planting in the gardens to enhance overall biodiversity and habitat creation on site.

Street Tree			
Species	Girth	Clear Stem	Height
<i>Pyrus calleryana</i> 'Chanticleer'	20-25 cm	2.0m	min. 450cm
<i>Tilia cordata</i> 'Greenspire'	20-25 cm	2.0m	min. 450cm
<i>Sorbus aucuparia</i>	20-25 cm	2.0m	min. 450cm
<i>Carpinus betulus</i> 'Fastigiata'	20-25 cm	2.2m	min 500cm
<i>Liquidambar styraciflua</i> worplesdon	20-25 cm	2.2m	min 500cm
<i>Crataegus monogygyna</i> 'Strica'	20-25 cm	2.2m	min 500cm
Open Space Trees			
Species	Girth	Clear Stem	Height
<i>Pinus sylvestris</i>	18-20 cm	2.0m	min. 450cm
<i>Fagus sylvatica</i> 'Asplenifolia'	18-20 cm	2.0m	min. 450cm
<i>Prunus avium</i> 'Plena'	18-20 cm	2.0m	min. 450cm
<i>Acer campestre</i>	18-20 cm	2.0m	min. 450cm
<i>Quercus robur</i>	18-20 cm	2.0m	min. 450cm
<i>Euonymus europaeus</i>	18-20 cm	2.0m	min. 450cm
<i>Sorbus aucuparia</i>	18-20 cm	2.0m	min. 450cm
<i>Betula pendula</i>	18-20 cm	2.0m	min. 450cm
Courtyard/Podium Trees			
Species	Girth	Clear Stem	Height
<i>Amelanchier lamarckii</i> 'Robin Hill'	18-20 cm	2.0m	min. 450cm
<i>Acer palmatum</i> 'Osakasuki'	18-20 cm	2.0m	min. 450cm
<i>Malus</i> 'Evereste'	18-20 cm	2.0m	min. 450cm
Back Garden Trees (increased biodiversity)			
Species	Girth	Root	Height
<i>Prunus domestica</i> 'Victoria' (Victoria plum)	14-16cm	BR	min. 250cm
<i>Pyrus communis</i> (Conference Pear)	14-16cm	BR	min. 250cm
<i>Malus</i> 'John Downie' (Native Eating Apple)	14-16cm	BR	min. 250cm



Proposed Overall Planting Species

Climbers

Native/adaptive climbers have been proposed through the scheme along the existing boundary wall. Species are chosen for robustness, seasonality, and biodiversity. Habitats will be formed along this boundary edge to the development public realm providing both visual and ecological rewards.

Shrub & Groundcover

Low level shrub and groundcover planting will be in single species blocks taken from an overall palette of species throughout the scheme with flowers and fruits attractive to wildlife such as bees and butterflies. Species will be of maximum 1m height at maturity to maintain clear sight lines.

The principal objective of the landscape proposals is to provide a high quality public realm, which is accessible, safe and distinctive. Planting and landscape works will be carried out in accordance with BS4428. Trees will be advanced/semi-mature rootballed stock, in accordance with BS 8545.

Low level, low maintenance shrub planting will be used in planting beds containerised with a minimum size of 2 litre pots, Climbers will have 1 litre pots, all with a 75mm well composted fine bark mulch.

Boundary Wall Climbers				
Species		Type	Size	Per Lin M
North and East Facing				
Lonicera caprifolium (European honeysuckle)		CG	1L	3
Parthenocissis quinquefolia (Virginia creeper)		CG	1L	3
South and West Facing				
Lonicera caprifolium (European honeysuckle)		CG	1L	3
Clematis armandii (Evergreen clematis)		CG	1L	3
Jasminum officinale (White Jasmin)		CG	1L	3
Hedge (Privacy Strips)				
Species	Designation	Root	Height	Per Lin M
Prunus lusitanica	3x transplanted, Bushy	RB	70-120cm	3
Lonicera nitida 'Maygreen'	2l, 30 -40cm spread	CG	30-40cm	4
Buxus sempervirens 'Suffruticosa'	2l, 30 -40cm spread	CG	30-40cm	4
Shrub and Ground Cover Mix 1 (to Privacy Strips and Open Spaces)				
Species	Designation	Root Type	Height mm	Spread mm
Rosmarinus officinalis	Container Grown	2l	200-300	200-300
Euonymus fortunei 'Emerald Gaiety'	Container Grown	2l	200-300	200-300
Sarcococca hookeriana	Container Grown	2l	300-500	300-500
Pittosporum tobira	Container Grown	2l	500-700	500min
Hebe 'Green Globe'	Container Grown	2l	100-200	200-300
Lavandula angustifolia	Container Grown	2l	200-300	200-300
Tiarella cordifolia	Container Grown	2l	200-300	200-300
Carex oshimensis 'Everest'	Container Grown	2l	200-300	300-500



Habitat Enhancing Species and Overall Implementation

Native Woodland Mix

A woodland mix is proposed in the community park and northern edge of the Eco Corridor the enhance biodiversity and strengthen existing habitats. Species are a mix of sizes and species providing a seasonal interest and strengthen biodiversity.

Seeding

The landscape development allows for a variety of seeding in the development to aid habitat creation and enhance biodiversity on site. A 1.5m amenity lawn verge will outline the edges of pathway through the development. Natural meadow planting is to occur through the open space in drifts forming fragmented corridors through the development. Amenity lawn will be placed in passive zones in the open space to allow for passive recreation areas. Meadow seeding to be 100% native sourced Irish provenance wildflower seeds. Amenity lawn seed shall conform in all respects to the European Communities (Seed of Fodder Plants) Regulations, 2002.

Landscape Implementation Programme

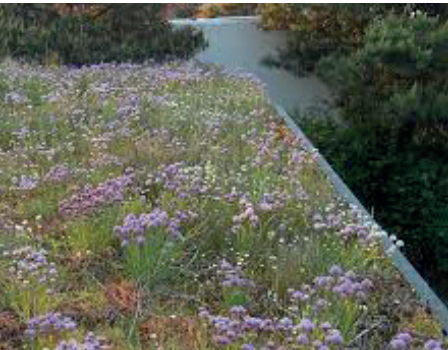
Planting on the site will commence with the completion of each stage of the works and as a result the programme is closely tied to construction operations. Ground preparation will precede planting and will include weed clearance and amelioration where necessary. Planting of species will be carried out in the dormant period from November – March, with grass seeding carried out from April – September, this will unsure ample opportunity for planting to establish properly and reduce casualties during the maintenance period.

Intensive landscape aftercare for each area will run for 12 months from the practical completion date using contact herbicides and hand weeding. There will be a period of 12 months defects liability on all planting with plant failures being replaced in the following planting season.

Native Woodland Mix 1				
Species	Size	Stem	Height	
<i>Pinus sylvestris</i>	18-20 cm	Clear Stem	min. 450cm	
<i>Euonymus europaeus</i>	16-18 cm	Multi	min. 350cm	
<i>Sorbus aucuparia</i>	18-20 cm	Clear Stem	min. 450cm	
<i>Betula pendula</i>	18-20 cm	Multi	min. 450cm	
Species	Age / Condition	Root Type	Height cm	Mix
<i>Quercus robur</i>	1+2 transplant	BR	90-120	
<i>Fraxius Excelsior</i>	1+2 transplant	BR	90-120	n/a
<i>Betula pendula</i>	1+1 transplant	BR	90-120	n/a
<i>Crataegus monogyna</i>	1+1 transplant	BR	90-120	n/a
<i>Pinus sylvestris</i>	2+0 transplant	BR	30-40	n/a
<i>Ilex aquifolium</i>	1+1 transplant	BR	20-30	n/a
<i>Euonymus europaeus</i>	1+1 transplant	BR	60-90	n/a
<i>Sambucus nigra</i>	1+1 transplant	BR	30-50	n/a
<i>Viburnum opulus</i>	1+1 transpant	BR	30-50	n/a
Extensive Green Roof				
				Type
<i>Wildflower Meadow Mat. (Containing 15 species native/adaptive species)</i>				Mat
Wildflower Meadow Grass Mix				
				Planting
<i>Native Meadow Seed Mix- Design By Nature(Following All Ireland Pollinator Plan)</i>				Hand Sown
Wet Meadow Grass Mix				
				Planting
<i>Native Wet Meadow Grass Mixture - Design By Nature(Following All Ireland Pollinator Plan)</i>				Hand Sown
Amenity Grass				
				Planting
<i>Amenity Grass Mix</i>				Hand Sown



AECOM



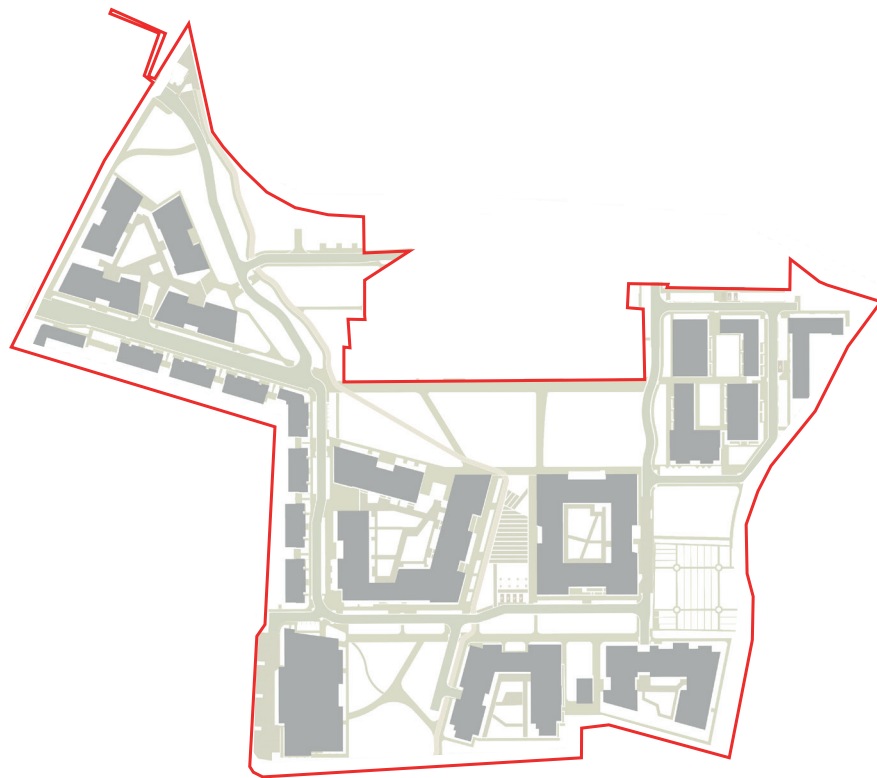
Hard Landscaping

Hardworks Materials

The hardworks palette has been chosen to enhance the hard surfaces and network of plaza's, roads and paths which link and connect the development.

Demonstrated opposite, a hierarchical categorisation of paving and finishes are described for the application throughout Dundrum Central SHD.

The success of any paving structure is dependent on the appropriate associated structural build-up, bedding and jointing associated with the surface material. The full specification of these structural elements must be detailed by suitably qualified engineers, and constructed in accordance with capable and experienced design contractors.



Hardscape Plan of SHD

Historic Landscape / Amenity Trails

A self bound gravel in buff colour. This surface will form the main surface on the central park, offering an opportunity for walking and recreation. Hard paving will be provided to accent areas/ focal points.



Self bound gravel



Paving setts to focal areas

Public Squares

The vision for the public squares is to create a high quality public realm spaces using a palette of robust materials to create a sense of place for each of these spaces.



Greater variety of materials within public squares



Trees set within paved areas

Parks & Open Space

A self bound gravel in buff colour. This surface will form the main surface on the parks , offering opportunities for walking and recreation. Feature natural stone elements will form key accents within the surfacing.



Soft natural edges with buff gravel pathway



Play surface to kids play areas

Streets

Roadside pathways will consist of brushed concrete. These paths will run alongside the road network and offer routes for pedestrians and cyclists. Macadam surface will incorporate buff textured aggregate to compliments path surfaces. Blister paving will be provided at crossing to ensure legibility for the visually impaired.



Brushed concrete pathway adjacent to macadam cycleways



Raised Tables at key junctions provide pedestrian hierarchy

Home Zones

Shared Streets and Homezones with make use of a variety of materials to create a more informal environment and character which is pedestrian and children focused.



Shared surface and permeable pavement



Low boundary wall and railing to Home Zones

Streetscape Design

Entrance Roads

There are two access road into the Dundrum SHD development. The existing entrance to the site and a new entry approximately 149m south of this entry point off Dundrum road. The existing entrance is outlined by mature Lime trees that will be protected and retained. The new entrance will provide cycle, pedestrian and vehicular access. Street trees will be proposed alongside raingardens where feasible.

Local Road

The sites overall road infrastructure is predominantly made up of a two-way local road 5.5m wide. Raised tables are positioned along pedestrian routes and will acting as a traffic calming measure through the scheme. Street trees will be proposed along the routes with each street containing a distinctive species that provides a sense of character to the street. On street parking will be permeable paving and will connect into the SuDs raingarden components. Privacy planting will act as a transition from pedestrian pathways into the private building blocks.

Shared Surface

Two shared surfaces zones are proposed in the scheme. The first is east of block 6 making the parking and roadway a pedestrian priority space.

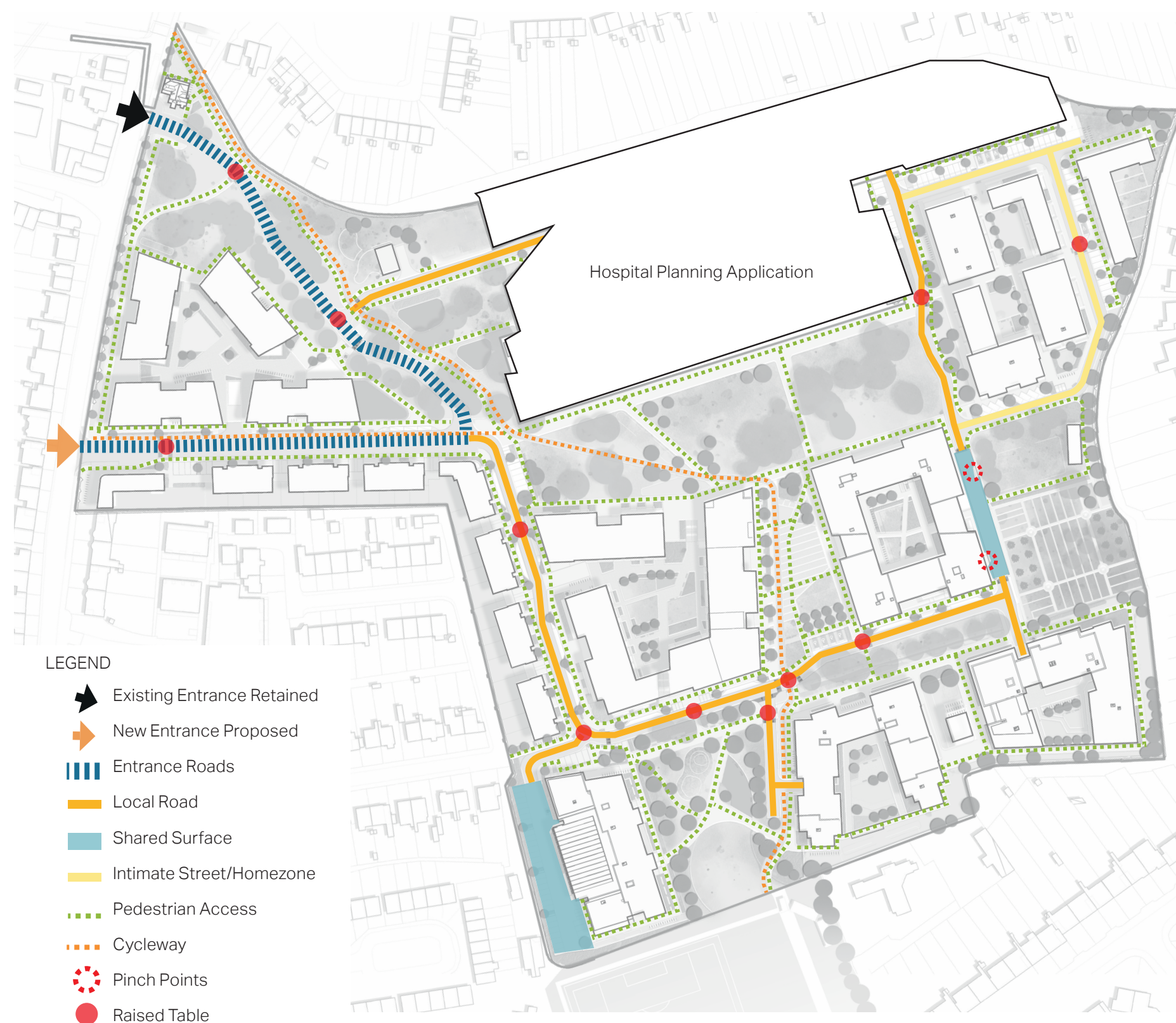
A shared surface location is also proposed east of the walled garden, west of block 3. This zone will have planting cutting into the trafficked area and providing a slower route that is safer and more enjoyable for pedestrians.

Homezone











The development to the east of block 2 is a homezone area with the aim to reduce vehicular dominance and provide a pedestrian hierarchy to the space. Perpendicular parking flows out onto a 5.5m road with street trees and clipped planting softening the overall zone.

Open space

The community park and central plaza will be key pedestrian and cycle routes on site. Generous areas have been established to ensure pedestrian priority and design flexibility has been established.

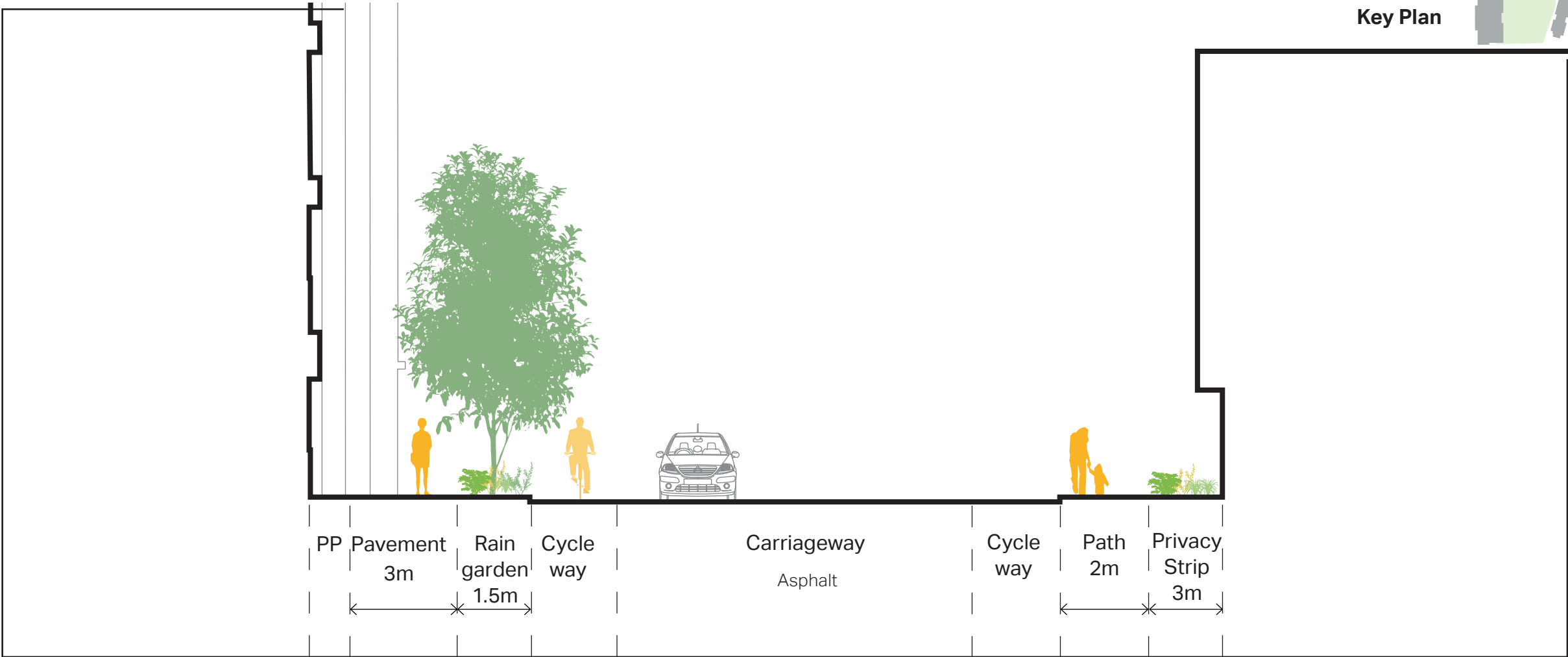
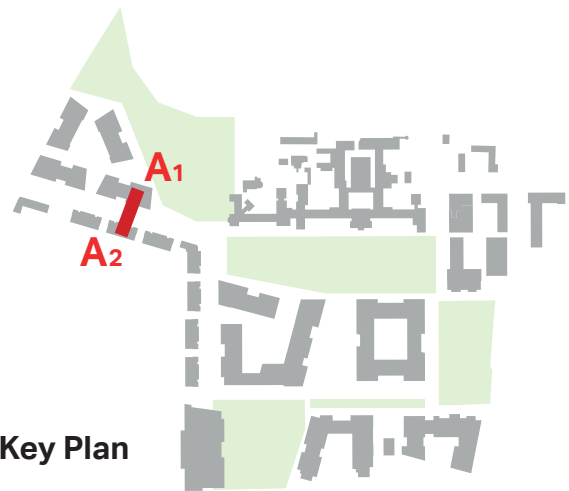


LEGEND

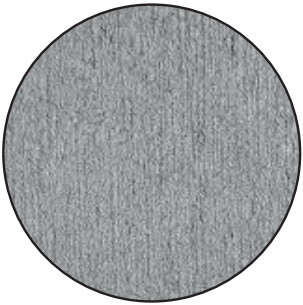
-  Existing Entrance Retained
-  New Entrance Proposed
-  Entrance Roads
-  Local Road
-  Shared Surface
-  Intimate Street/Homezone
-  Pedestrian Access
-  Cycleway
-  Pinch Points
-  Raised Table

Section A

Access Road



PP: Privacy Paving
Small Precast Unity Paving



Pavement/Path
Brushed Concrete



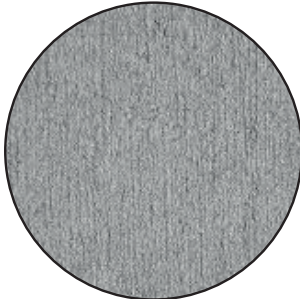
RG: Rain garden & Street Trees
Biodiverse Planting



Cycleway
Demarcation on Asphalt



Cycleway
Demarcation on Asphalt



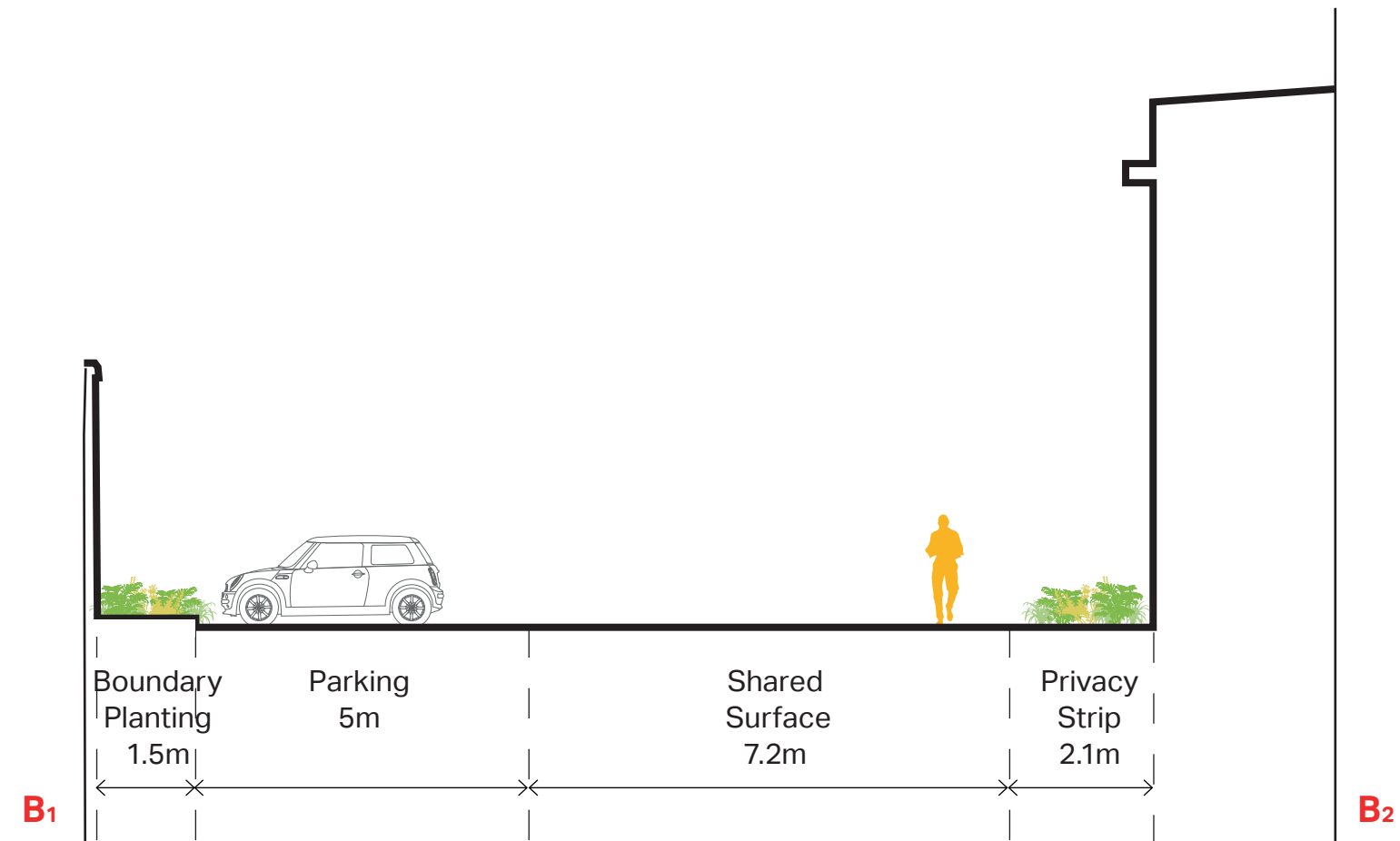
Pavement/Path
Brushed Concrete



Privacy Strip & Street Trees
Structure Planting

Section B

Shared Surface



Boundary Planting

Climbers and Mix
Native Planting



Parking

Permeable Paving



Shared Surface

Asphalt with Chippings

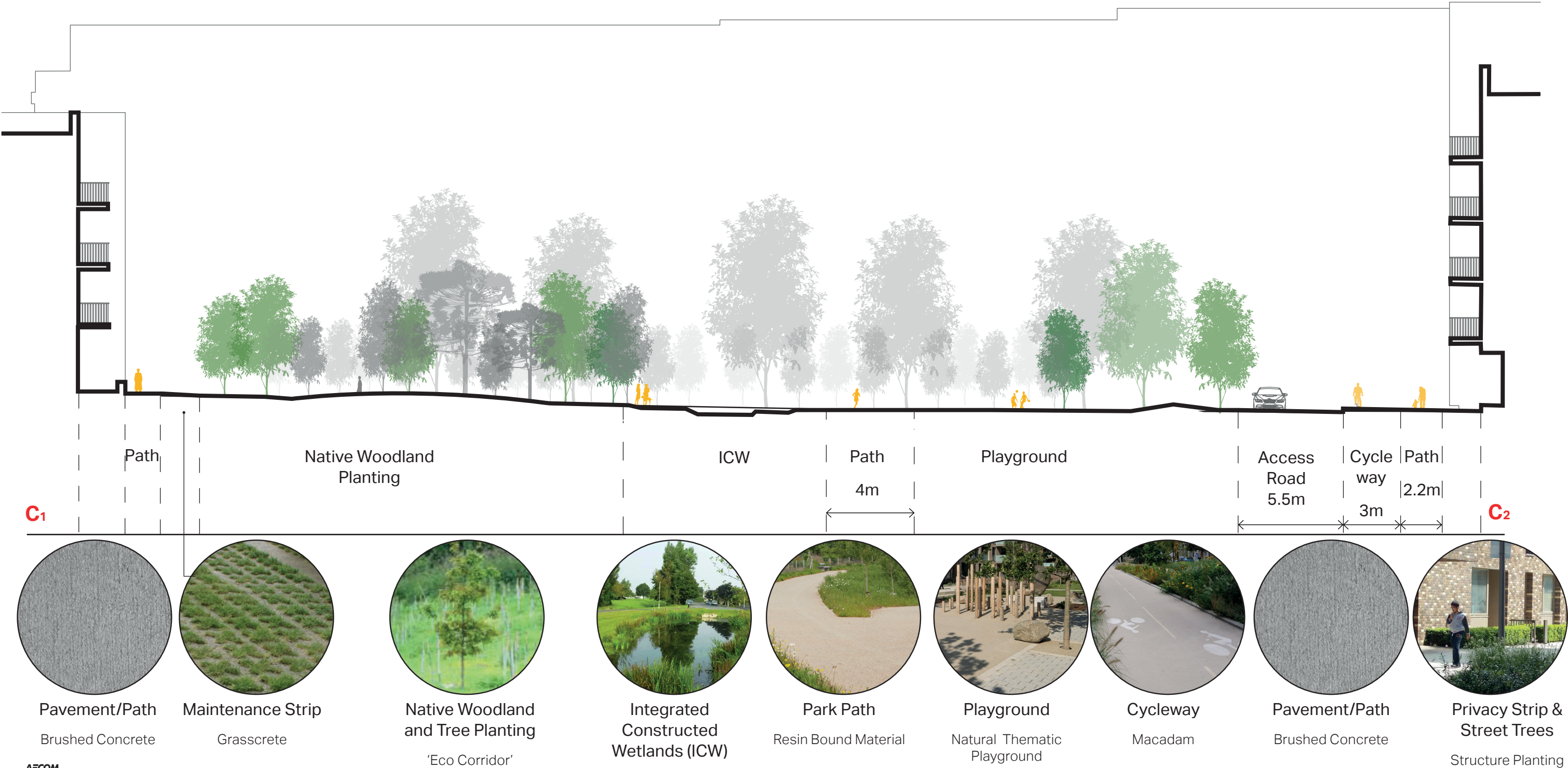
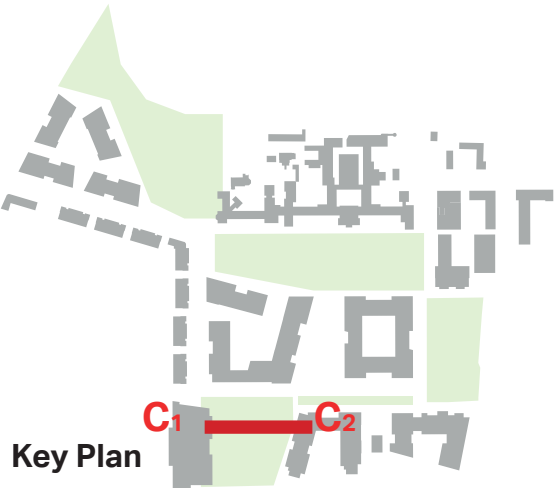


Privacy Strip

Structure Planting

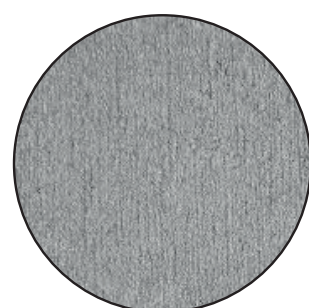
Section C

Access Road & Community Park



Section D

Local Road & Eco Corridor



Pavement/Path
Brushed Concrete



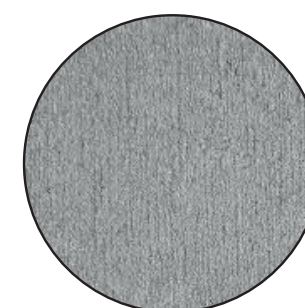
RG: Raingarden &
Street Trees
Biodiverse Planting



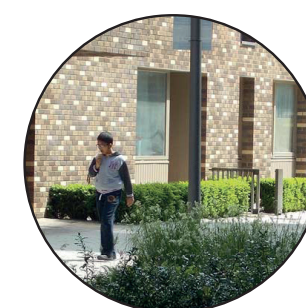
Native Woodland
and Tree Planting
'Eco Corridor'



Wet Seeding
Biodiverse Ditch



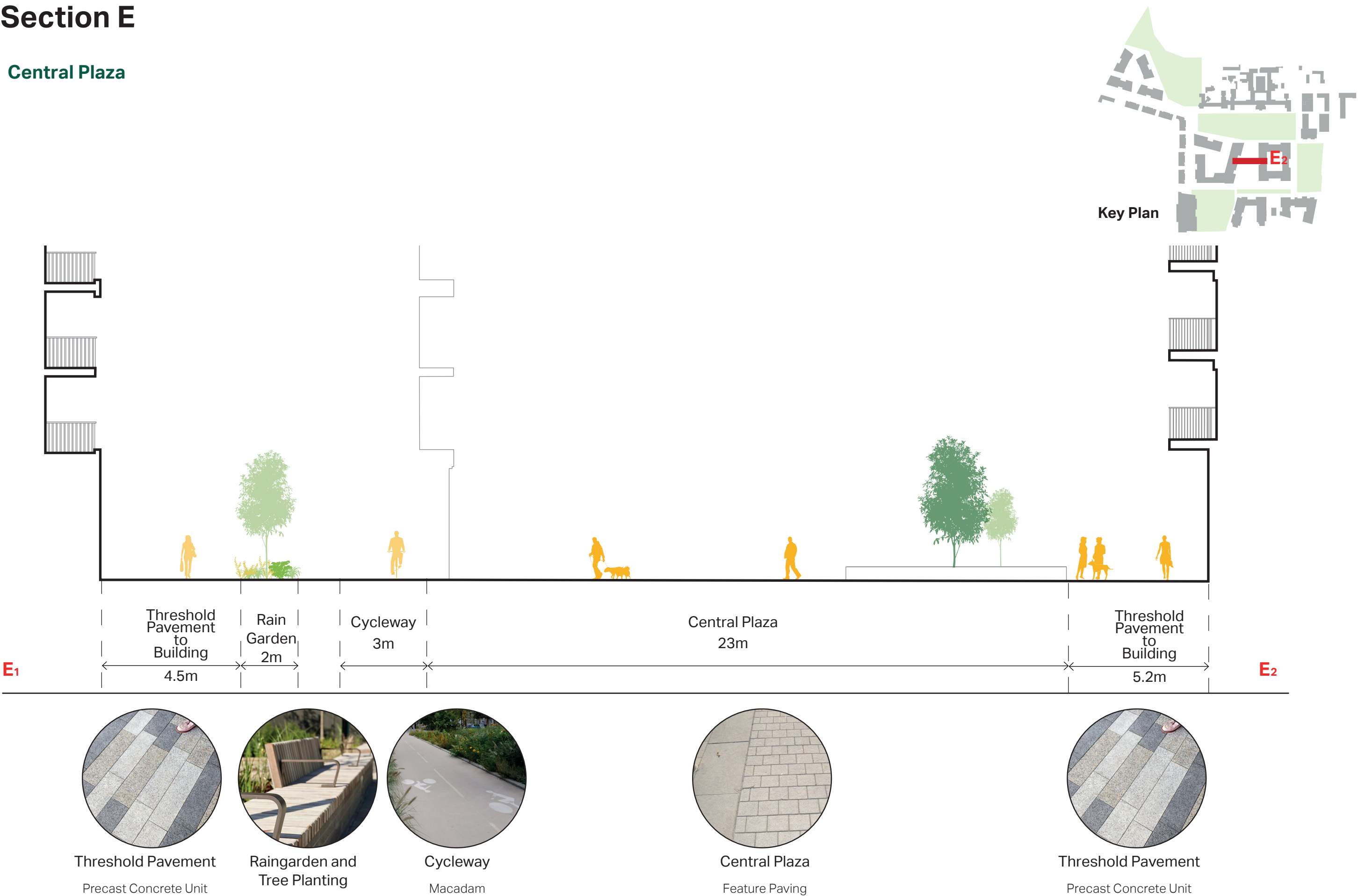
Pavement/Path
Brushed Concrete



Privacy Strip &
Street Trees
Structure Planting

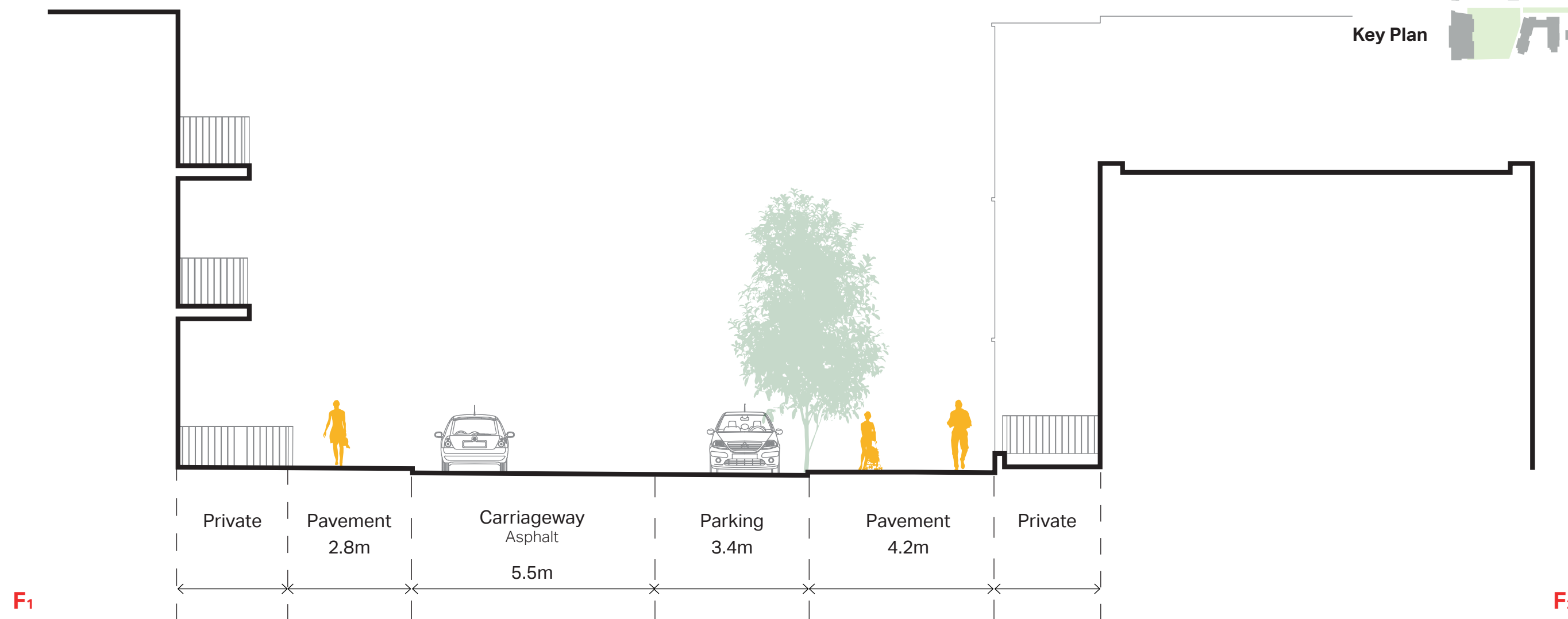
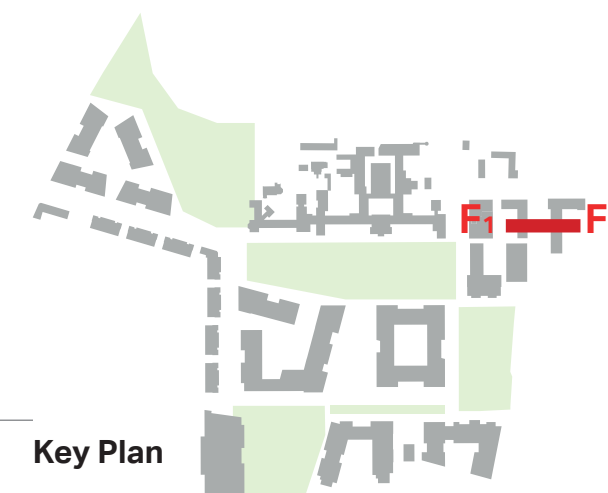
Section E

Central Plaza

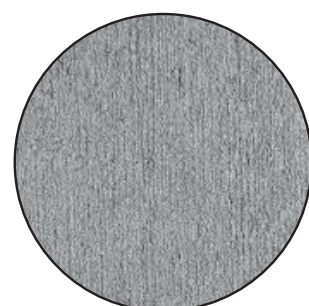


Section F

Homezone



Privacy Boundary
Low Wall and Railing



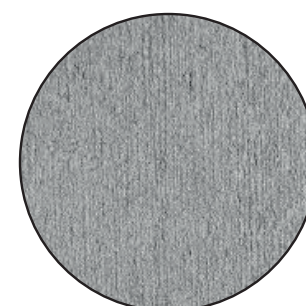
Pavement/Path
Brushed Concrete



Parking
Permeable Paving



Street Tree
Planting
'Small Street Trees'



Pavement/Path
Brushed Concrete



Privacy Boundary
Low Wall and Railing

Site Furniture

Universal Access

Street furniture must take cognisance of all users, while contributing to the wider visual qualities of the town environment. Location should also be determined by shelter and good clear views.

Seating must be no more than 450mm high, and offer 100mm of heel space. Units should be placed 600mm back from any line of movement, flush with surrounding levels, and offer an 800mm x 1300mm square of firm paving for an adjacent wheelchair. Headroom of less than 2100mm should be avoided.

Seating should be provided at regular intervals: located no more than 50m apart where possible. This should be planned so as to ensure that the resting points are along defined routes.

Enhancing the Streetscape

The use of street furniture that caters for universal access allows an inclusive design scheme that in turn will enhance the streetscape. Creating and providing spaces that attract users of all ages and abilities will in turn bring life to the street. Taking consideration for those who are most vulnerable, to the front of the design allows the formation of a suitable solution and creates a universally inclusive space.

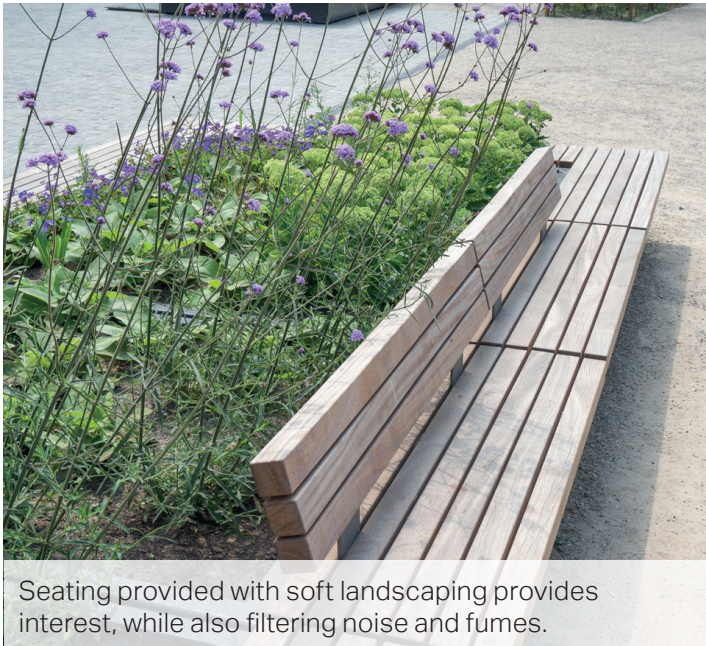
Seating



In-built elements provide opportunity for more universal usership



Rest opportunities



Seating provided with soft landscaping provides interest, while also filtering noise and fumes.



Contemporary street furniture can also provide play opportunities



Single chairs can provide a location for short breaks



Seating with back support offers user comfort and directional focus, ensuring an element of containment.

Bicycle Parking



Cycle stand parking set back from the pedestrian thoroughfare with different paving, against a surface colour and texture change.

Bollard and Bins



Important features which create a definite boundary and edge.



Contemporary and functional bins that contrast well with surrounding environment.

