Landscape Design Report

LCLE001 Cleeves Limerick

Report Details

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Report Contents

This landscape design document sets out the vision and design intent for the external spaces at Cleeves, shaping a landscape that is functional, resilient, and rooted in its local context. Included are details of amenity, nature based SuDS, materials, and planting which come together to form a durable, cohesive and enjoyable landscape.

1.0 Introduction

Introduction

Mitchell + Associates were commissioned in 2020 by Limerick Twenty Thirty as landscape architects to the Architect-led Integrated Design Team appointed to the Cleeves Riverside Quarter project.

The AIDT team consist of:

Architect: Feilden Clegg Bradley Studios

Architect: Bucholz McEvoy Architects

Landscape Architect: Mitchell + Associates

Structural Engineer: ARUP

Civil Engineer: ARUP

Services Engineer: ARUP

Fire Safety Engineer: ARUP

Flooding Consultant: ARUP

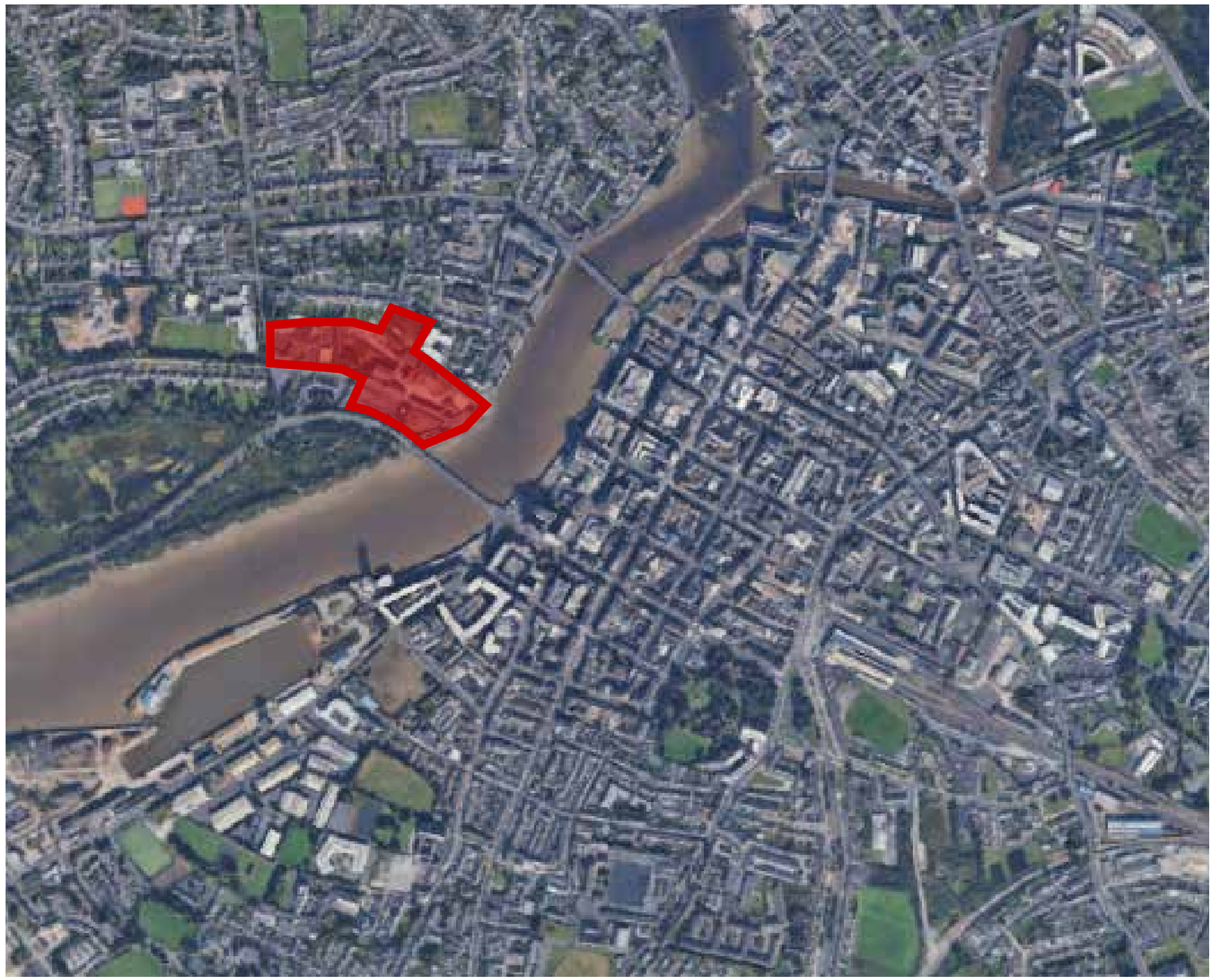
CDWMP Consultant: ARUP

The Cleeves Riverside Quarter (CRQ) site is a unique place in the city, situated at the at a key location on the River Shannon. It is easily identifiable by its iconic flaxmill and chimney, and the former Salesians school at Fernbank which sits on high ground over the quarry and reservoir.

The project is underpinned by the CRQ Masterplan (2023), a summary of which is included in the Architectural Design Statement (ADS). Phase 1 of the project is the ongoing stabilisation and repair of the Flaxmill protected structure. This landscape design document sets out the vision and design intent for the landscape design for Phase 2 – Residential and Public Realm - of the Cleeves Riverside Quarter, shaping a landscape that is functional, resilient, and rooted in its local context.

The ambition of Limerick Twenty Thirty (LTT) is to revitalise the Cleeves site and surrounding area to deliver a world class proposal for this strategic location in Limerick's urban core. The success of the proposals will lie in their ability to achieve a number of primary objectives:

- supporting the growth of a strong local economy;
- encouraging and facilitating new business investment;
- retaining and integrating the historic buildings and site industrial heritage with contemporary buildings;
- accommodating a mix of uses anchored by a public realm that relates and links to the City core and the River Shannon, whilst implementing high quality urban design, with sustainable and innovative design.



Development Description

The proposed development comprises Phase II, of an overall Masterplan with four phases of development proposed. Phase II will commence subsequent to ongoing emergency stabilisation and repair of the Flaxmill protected structure (Phase I). Phase III is intended to comprise an educational campus, inclusive of the adaptive reuse of the Flaxmill Building as part of that development and will be subject to a future separate application. Phase IV comprising the Shipyard site will be the final phase of development.

Two structures within the site are designated protected structures; the Flaxmill Building (PS Ref no.264 & NIAH No. 21512053) and the octagonal brick chimney (PS Ref no.265 & NIAH No. 21512059), which are to be retained.

The proposed development includes:

A. Demolition of a number of structures to facilitate development including (i) Salesians Secondary School and Fernbank House; (ii) 2 no. houses on North Circular Road; (iii) Residual piers from the basin of the reservoir; (iv) Upper Reservoir on Stonetown Terrace comprising 2 no. concrete water tanks, pump house and liquid storage tank; (v) 1960's lean-to building structures adjoining the Cold Store (former Weaving Mill); (vi) remaining fabric of c20th rear lean-to of the Flaxmill Building; (vii) c.1960s office building adjoining the Packing Store and Cheese Plant on North Circular Road; (viii) Cluster of buildings including altered part of the Linen Store, the former Linen Store, Storage Building, and Office/Lab building at O'Callaghan Strand / Stonetown Terrace with partial retention of existing stone wall; (ix) warehouse on the Shipyard site; and (x) partial removal of stone boundary wall defining the Cleeves site adjoining O'Callaghan Strand / Stonetown Terrace and around the Shipyard site.

B Construction and phased delivery of:

i. Residential Development in 4 development 'zones' within the site ranging in height from 3 – 7 storeys (with screened service plant at roof level) comprising; (a) 234 no. residential units; (b) 270 no. student bedspaces with ancillary resident services at ground floor level; (c) 299sqm of commercial floorspace; and (d) a creche. The specific development details of each proposed development zone comprise the following:

- Salesians Zone – 1 no. building with 2 no. blocks extending to 6 and 7 storeys comprising 146 no. apartments (76 no. 1 bed; and 70 no. 2 bed); a creche; semi basement car and bicycle parking; reception area, plant rooms, and refuse storage, with screened external plant and photovoltaic panels at roof level; 20 no. 3 storey 3 bed triplexe units with photovoltaic panels at roof level; and 30 no. car parking spaces for the dedicated use of the adjoining Salesians Primary School.

- Quarry Zone – 1 no. Purpose Built Student Accommodation (PBSA) building with 3 no. blocks extending to 6 and 7 storeys comprising 270 no. bedspaces with study rooms, shared areas, exercise room, reception area, plant rooms, refuse storage and bicycle parking all at ground floor level and screened external plant and photovoltaic panels at roof level. Provision is made for telecommunication antennae on the roof top of one block. Consent is also sought for use of the PBSA accommodation, outside of student term time, for short-term letting purposes.

- Stonetown Terrace Zone – 1 no. building extending to 4 - 5 storeys comprising 38 no. apartments (6 no. studios; 12 no. 1 beds; and 20 no. 2 beds) with plant rooms and refuse storage at ground level, ancillary infrastructure at basement level at northern end of the block, with screened external plant and photovoltaic panels at roof level; 9 no. 3 storey 3 bed townhouses with photovoltaic panels at roof level; and a dedicated secure bicycle storage facility.

- O'Callaghan Strand Zone – 1 no. building extending to 4 / 5 storeys comprising 21 no. apartments (9 no. 1 bed and 12 no. 2 bed) with an open roof structure accommodating communal open space, plant and photovoltaic panels; and 299qm of commercial ground floorspace intended to accommodate Class 1, Class 2 and / or Class 3 uses, with provision for car parking in the undercroft.

ii. Dedicated mobility hub with canopy and photovoltaic panels including double stacker bicycle parking; and EV Charging spaces, within the Shipyard Zone. A dedicated pedestrian/cycle link connects North Circular Road with Condell Road. The remaining area of the zone shall accommodate temporary car parking and a temporary external event space to be used on a periodic basis as the need arises, pending future redevelopment proposals as detailed in the Masterplan (Stage IV).

iii. Extensive provision of Public Realm including creation of the Reservoir/Quarry Park, the Flaxmill Square and the Riverside Corridor. Significant areas of civic and green spaces are provided, incorporating formal and informal play space; nature based SuDs, permeability and access; and a riverside canopy with photovoltaic panels functioning as an outdoor event space and incorporating heritage interpretative panels

iv. 3 no. dedicated bat houses;

v. Telecommunication antennae on roof of Block 2A of the PBSA, including (a) 9 no. Support poles to support 2 no. antennae each; (b) 6 no. microwave dishes affixed to the plant screen; and (c) associated telecommunications equipment and cabinets (effectively screened). To facilitate technologically acceptable locations at the time of delivery, a micro-siting allowance of 3m is proposed on the roof top of Block 2A of the PBSA for the infrastructure.

vi. Provision of vehicular access/egress points including (a) utilisation of existing access points to the Salesians Zone, to the Flaxmill and Quarry Zones and to the Mobility Hub on the Shipyard Site Zone; (ii) reopening an existing (currently blocked) access point off O'Callaghan Strand; (iii) new access points to the proposed undercroft carparking at Salesians from the North Circular Road and at the end of Stonetown Terrace road which provides access to the Stonetown Terrace Zone; and (iv) emergency access only from Stonetown Terrace to the Flaxmill Zone;

vii. Provision of 30 no. dedicated car parking spaces to serve the Salesians Primary School; and

viii. All ancillary site development works including (a) water services, foul and surface water drainage and associated connections across the site and serving each development zone; (b) attenuation proposals; (c) raising the level of North Circular Road between Fernhill and O'Callaghan Strand; (d) refuse collection store (e) car and bicycle parking to serve the development; (f) public lighting; (g) all landscaping works.; and (h) temporary construction measures including (i) construction access to the Quarry site including provision of a temporary access across the reservoir; and (ii) temporary use of onsite mobile crusher.

An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) have been prepared as part of the application in respect of the proposed development.

2.0 Site Context & Strategy

Green Infrastructure

Strategy

The landscape strategy is based on principles of green Infrastructure, whereby the green assets of the site and its environs for connections that support 4 key themes relating to the spatial uses.

These 4 themes are:

1. Recreation, health and well-being
2. Natural heritage
3. Sustainable water Management
4. Cultural heritage

Whilst Cultural Heritage is not normally viewed as a component of Green Instructure, it is an important factor on the CRQ site, and serves to drive the conservation and interpretation of cultural assets that are so closely linked to the natural environment.

Recreation, health and well-being

Proximity to open space and nature is vital for health and provides amenity for recreation and play. good connectivity to open space, and permeability of those spaces encourage ease of use. The Cleeves green Infrastructure Strategy links the adjoining open spaces associated with the river Shannon, and uses the amenity potential of the quarry and reservoir area as an amenity space with a mix of active and passive uses. This area is a space for the city, and supports the amenity spaces for the residential areas of Stonetown Terrace, Silesians, and the Quarry. The area around the Flaxmill and river front are harder and more civic in use, and provide opportunities for city-scale events and water-based activities.

Natural heritage

The strategy is to reinforce the setting on the River Shannon and links to the Special Area of Conservation, and to enhance ecology and biodiversity with an integrated design approach. The Special Area of Conservation to the south west of the Cleeves Riverside Quarter forms a formidable approach to Limerick along the Shannon, and is the main approach coming from Shannon Airport or via the tunnel. The CRQ site has extended and employed this blue-green infrastructure within its operations: the former industrial use took advantage of the water from the Shannon and collected and used rainwater for its vital system, as well as the resulting habitat associated with the quarry whose stone was used to build the site – relating natural and cultural heritage directly. The enhancement of natural heritage and therefore biodiversity is particularly focused on the following: - wildlife corridors and tree groves - pioneer and regenerative planting - green streets – NBS SuDS features to manage surface water - biodiverse areas across the scheme and with a focus at the quarry, reservoir and river - selection of native, pollinator friendly plant species of local provenance -green/blue roofs.

Sustainable Water Management

Closely allied to natural heritage and the existing ecology on and adjacent to the site is the presence of water in the form of the reservoir, wetlands and the river Shannon. Water stewardship, and the sustainable management of water aims to slowly deliver clean water to ground and water courses, or recycle it as harvested rainwater. Creating nature-based solutions in the form of raingardens, swales and sheughs enhance habitats and generate biodiversity – in this instance developing a correlating wetland and riparian habitat with the local context. Exploring the expression of water management in playful detailed design through visible surface channels, water courses, and discharge from roofs will help people understand and celebrate the importance of water.

Cultural heritage

The expression of cultural heritage allows a strong sense of place to be maintained and enhanced. Its interpretation allows visitors to associate identity and memory with the place. The land form at CRQ is borne out of the cultural heritage, particularly the quarried site and the stone buildings. The reservoir and buildings speak of the industrial functions and the harnessing of natural resources beside the Shannon. The open spaces are therefore imbued with heritage from the association of those elements through to the detail in industrial artefacts, furniture and surfacing. The redevelopment of CRQ as a place to live, work, and play means that the open spaces also become a place where new heritage is generated.

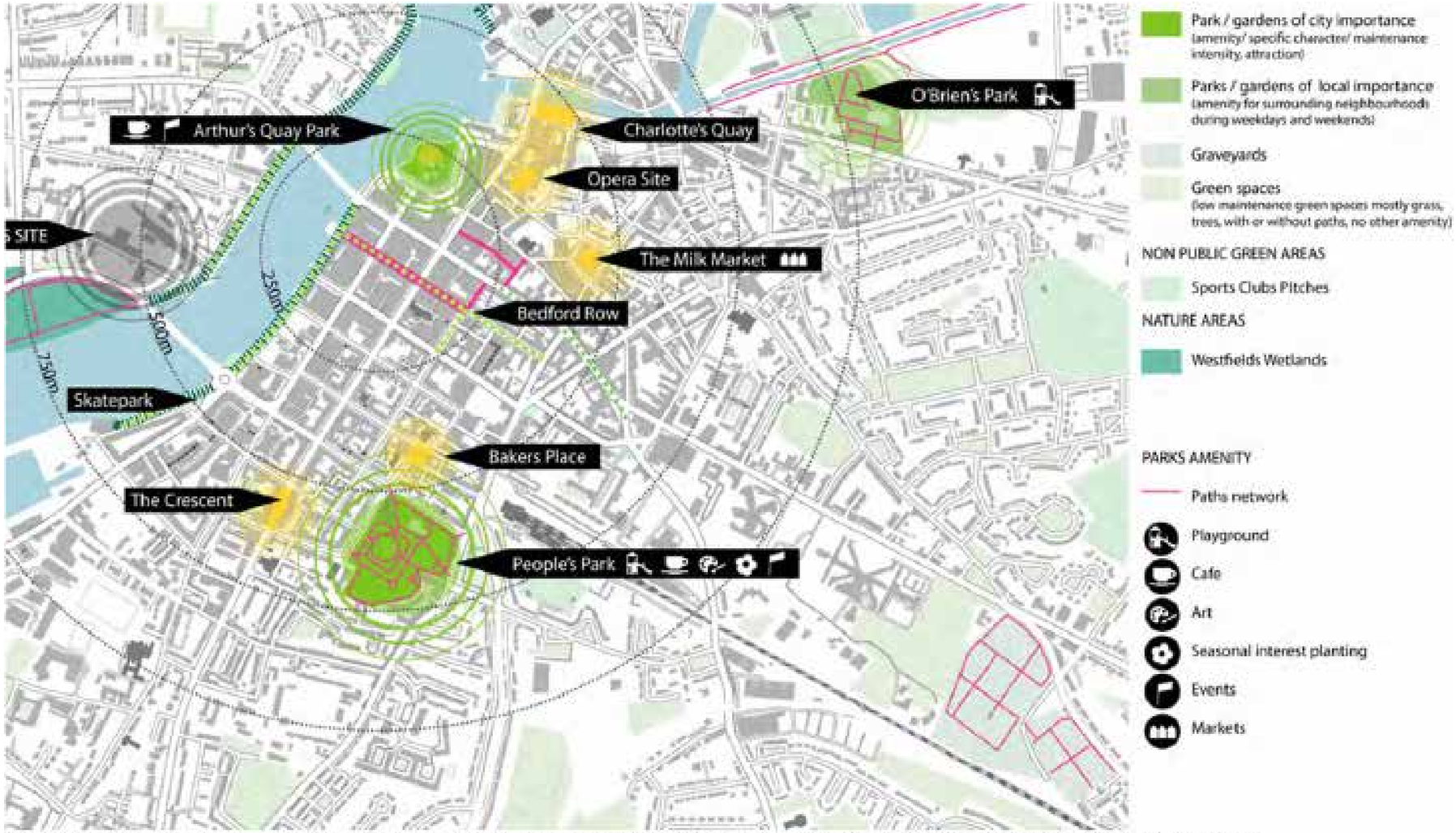
Green Infrastructure

Diagram

City Spaces

Landscape Strategy

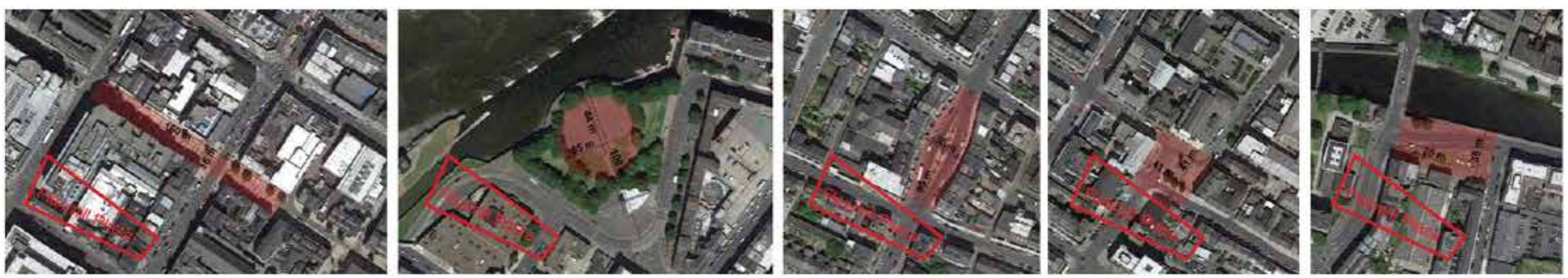
The Landscape Strategy includes a review of Limerick's civic spaces and public parks, identifying that there is limited amenity on the northern side of the river Shannon. The unique combination of green assets defines the landscape character of Cleeves Riverside Quarter consisting of the quarry area with its rough rock walls with pioneering vegetation, sheltered and sunny micro-climate, the reservoir as a significant water body within the site, and the industrial scale spaces. The Flaxmill and Riverside civic spaces offer, in contrast, a great opportunity for large events, with the Flaxmill square being the largest plaza in Limerick without daily vehicular traffic. Its location on the northern side of the river Shannon, yet in close proximity to the city centre of Limerick, means there is a great potential for a site specific open space amenity, reinforcing the credentials of Cleeves Riverside Quarter as a unique destination in the city.



Above : MAP OF LIMERICK SHOWING THE DISTRIBUTION OF CIVIC SPACES AND PUBLIC PARKS IN THE CITY. Only two parks have been identified as parks of city importance thanks to their amenity/specific character/maintenance intensity and attraction: People's Park and Arthur's Quay Park, both on the South side of the river Shannon.

Right: CIVIC SPACE SIZE COMPARISON,
each overlaid with the Flaxmill plaza area.

From left to right:
Bedford Row pedestrianised street,
Arthur's Quay park's central event plaza,
The Crescent,
Baker Place plaza,
Charlotte's Quay.

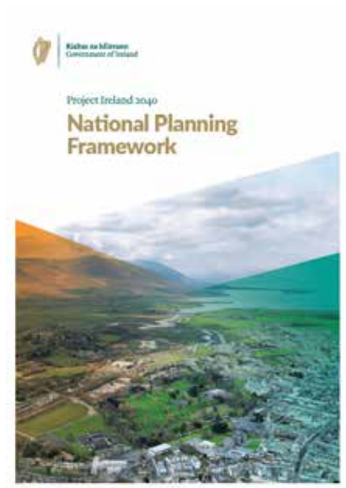


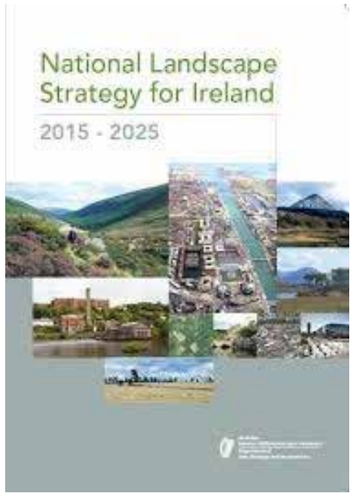
3.0 Landscape Planning Guidance

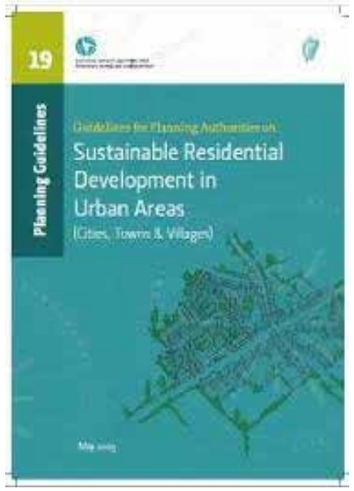
National Planning Context

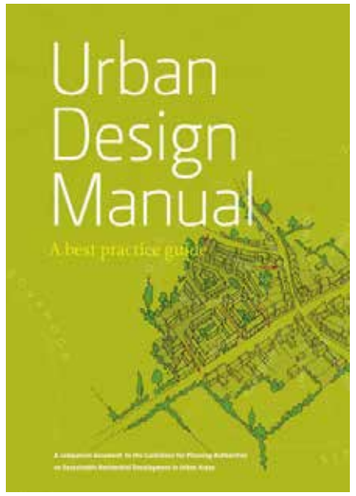
The landscape strategy and design has been developed with reference to key national guidance. These include the following reports.

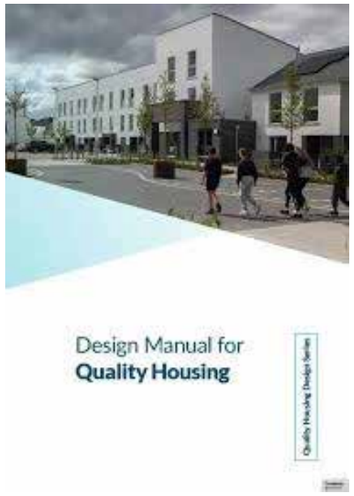
- National Planning Framework, Project Ireland 2040
- National Landscape Strategy 2015-2025
- Quality Housing for Sustainable Communities - Best Practice Guidelines (2007 with updates))
- Guidelines for Planning Authorities on Sustainable Residential Developments In Urban Areas (2009)
- Urban Design Manual - Best Practice Guide (2009)
- Design Manual for Quality Housing (2022)
- Sustainable Urban Housing: Design Standards for New Apartments (2025)new cover
- Design Manual For Urban Streets and Roads (DMURS)
- All Ireland Pollinator Plan (2021-2025) and Planting Code
- Ready Steady Play – A National Play Policy 2019
- Climate Action Plan (2023)
- Nature-Based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas - Best Practice Interim Guidance Document (2022)
- Bats and Artificial Lighting at Night. Bat Conservation Trust Guidance Note 08/23

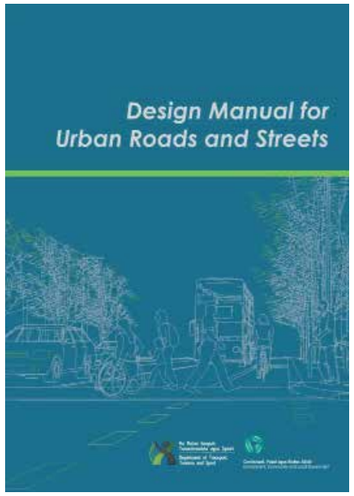


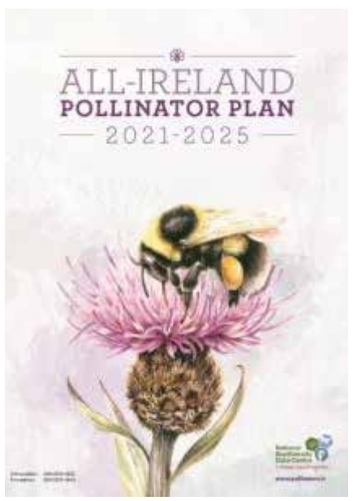


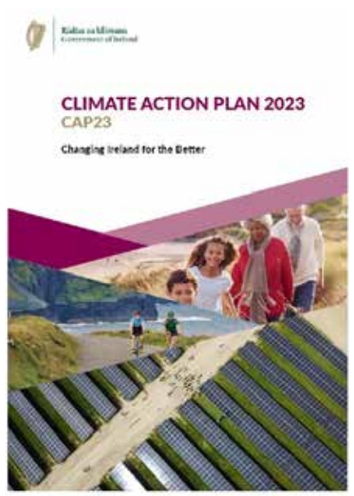


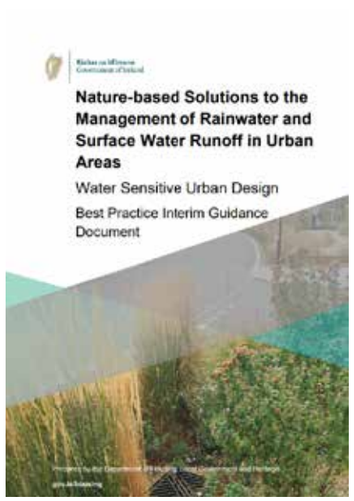


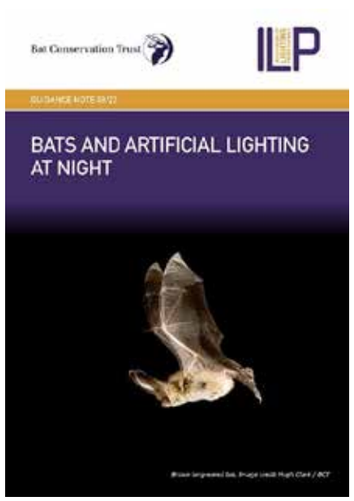












Local and Regional Planning Context

Local and Regional

The following documents written at a local and regional level inform the Cleeves Riverside Quarter landscape design proposals.

Limerick City & County Council

- Limerick Development Plan 2022-2028

The landscape design strategy is guided by the local policies and objectives of the Limerick County Development Plan 2022-2028. The following extracts are particularly relevant to the landscape strategy and design:

- Policy EH P2 - Sustainable Management and Conservation

It is a policy of the Council to ensure the sustainable management and conservation of areas of natural environmental and geological value within Limerick and to protect, enhance, create and connect, where ecologically suitable, natural heritage, green spaces and high-quality amenity areas for the benefit of biodiversity.

The landscape design is based initially on a Green Infrastructure Strategy that sets up the connectivity and conserves and enhances existing habitats and generates new ones. Of note is the balance of exposed and re-vegetated rock face in the quarry that allows an understanding and interpretation of the local geology, that is the genesis of the site.

- Objective EH O7 - All Ireland Pollinator Plan

It is an objective of the Council to: Continue to actively support the aims and objectives of the All Ireland Pollinator Plan 2021 – 2025, by encouraging measures to protect and increase the population of bees and other pollinating insects in Limerick

The proposed scheme maximises areas for biodiversity and associated planting which is based on a structure of native planting, and enhanced by adaptive and pollinator friendly planting. The variety of areas include NBS swales and raingardens, crushed rubble beds, quarry face, lime mortared walls, riparian zones and floating islands at the reservoir, climbing plants, and general tree and vegetated area that define buffer zones, and amenity.

- Objective EH O10 - Trees and Hedgerows

..require the planting of native trees, hedgerows and vegetation and the creation of new habitats in all new developments and public realm projects.

The planting strategy is underpinned by a native tree planting structure that is supported by adaptive and other species that enhance habitat, biodiversity and climatic change resilience.

- Objective EH O12 - Blue and Green Infrastructure

It is an objective of the Council to: a) Promote a network of blue and green infrastructure throughout Limerick.

Through the planting of native trees, shrubs and hedges the proposed scheme looks to contribute to and intertwine with Limericks wider green infrastructure network providing ecological benefits and habitat for local wildlife and pollinators.

- Objective IN O12 - Surface Water and SuDS & Objective EH O14 - Nature Based Solutions IN O12 j)

SuDS schemes to be designed to incorporate the four pillars of water quality, water quantity, biodiversity and amenity to the greatest extent possible within the constraints of a given site.

- Objective EH O14

It is an objective of the Council to increase the use of Nature Based Solutions (NBS) throughout Limerick

The landscape strategy and design is informed by the Limerick City and County Council's 'Limerick City and Environs Blue Green Infrastructure Strategy'. The proposals include Nature Based Sustainable Drainage Systems throughout. The scheme also demonstrates the passage of water throughout the site, maintaining as far as possible surface water flow to demonstrate best practice water stewardship.

- Objective EH O24 - Light Pollution

It is an objective of the Council to ensure that the design of external lighting schemes minimise the incidence of light spillage or pollution in the immediate surrounding environment. In this regard, developers shall submit lighting elements as part of any design, with an emphasis on ensuring that any lighting is carefully directed, not excessive for its purpose and avoids light spill outside the development and where necessary will be wildlife friendly in design.

The lighting has been designed to minimise light pollution, and to utilise low level lighting in areas identified by the ecologist – including along bat foraging routes.

- Policy SCSI P1 - Sustainable Communities –

It is a policy of the Council to seek to improve the provision of community infrastructure and recreational opportunities for the wider community, in co-operation with relevant bodies, in a sustainable manner in accordance with the settlement strategy of the Draft Plan. This is conducive to ethical principles of healthy communities, inclusivity and accessibility to facilities for all abilities and sustainability to ensure that Limerick is a greener, cleaner, more welcoming place to live, work and attract investment.

The landscape design provides opportunities for socialising and recreation in informal ways within Communal Open Spaces so that neighbours can get to know each other and build new communities. The Public Open Space offers play areas, and also play for all including opportunities for structure activities such as rock climbing and kayaking, and for events, particularly focused at the Flaxmill Square canopy. These opportunities will help to build a new community within the larger site and to – due to the permeable quality of the scheme integrate with the city.

- Objective SCSI O2 Accessibility for All

It is an objective of the Council to:

a) Seek the provision of appropriate, inclusive and accessible, safe amenity, recreational open space and community facilities that are available for all sections of the community, both urban and rural at a convenient distance from their homes and places of work.

b) Ensure that community facilities, recreation, play and leisure facilities are fully accessible to all users and are compliant with current legislative requirements.

The design has been developed to respond to M+A's Inclusive Landscapes strategy which aims to create a diversity of spaces and amenity for a diversity of people (age, disability, gender, race, ethnicity, sexuality and religion), based on the Equal Status Acts 2000-2018. Accessibility on the site of dramatic level changes is a key consideration in the design. The scheme has been designed in line with the National Disability Authority's guidance 'Building for Everyone', 'Universal Design Guidance for Homes in Ireland', as well as the Building Regulations.

- Policy SCSI P5 - Play & Objective SCSI O27 - Play `

It is a policy of the Council to facilitate opportunities for play and support the implementation of the Limerick City and County Council Play Policy and its objectives.

The scheme builds on LCCC Play Policy, the Planning Design Standards for Apartments Guidelines for Planning Authorities (2025) and the principle of Inclusive Landscapes noted above to provide formal and informal play for children of varying ages, and opportunities for play for all ages.

- Objective SCSI O32 - Public Art Strategy

It is an objective of the Council to develop a Limerick Public Art Strategy and Limerick Public Art Policy to facilitate the continued development of public arts within the public realm

Limerick Twenty Thirty has ongoing engagement with the arts in Limerick, hosting events on the Cleeves Riverside Quarter site. The proposed scheme facilitates this relationship, specifically providing a canopy that will facilitate events. The landscape design has opportunities to engage with artists for physical artwork, including the interpretation of the legacy of the Salesians at Fernbank, and in the interpretation of water stewardship in the water spouts at the quarry walls.

In Limerick, 2030's the date,

For swifts to thrive, a hopeful state.

With nest boxes placed,

And habitats graced,

They'll soar and nest, sealing their fate.

Limerick Twenty Thirty (Supporting Birdwatch Ireland's 'Saving Swifts' initiative).

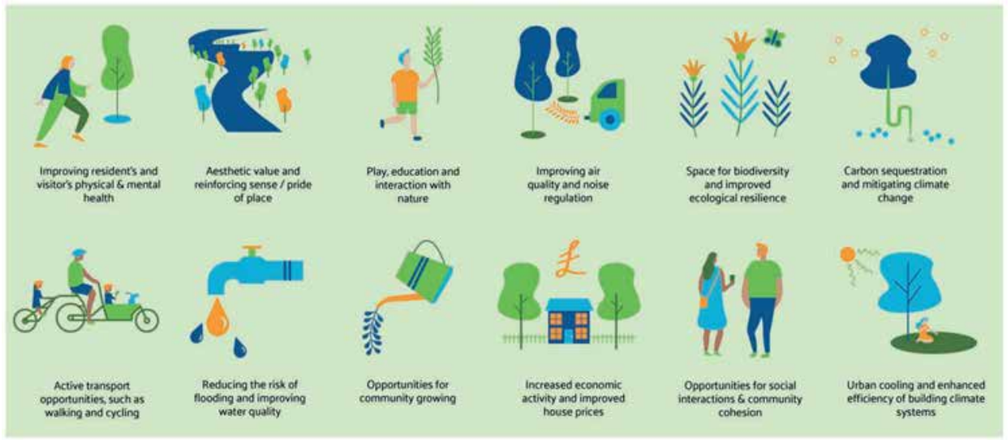
Local and Regional Planning Context

Limerick City and Environs Green Blue Infrastructure Strategy

The CRQ landscape strategy an design proposals are in alignment with the objectives of the Limerick City and Environs Green Blue Infrastructure Strategy. The initial Green Infrastructure strategy for the site informs the proposals, ensuring that connectivity for biodiversity, water – and indeed humans is embedded in the scheme. The deliberate visual expression of habitat enhancement and water stewardship is intended to inform and educate around GBI and climate resilient approaches to design.

Limerick City And County Council Play and Recreation Policy

Refer to Policy SCSI P5 - Play & Objective SCSI O27 above



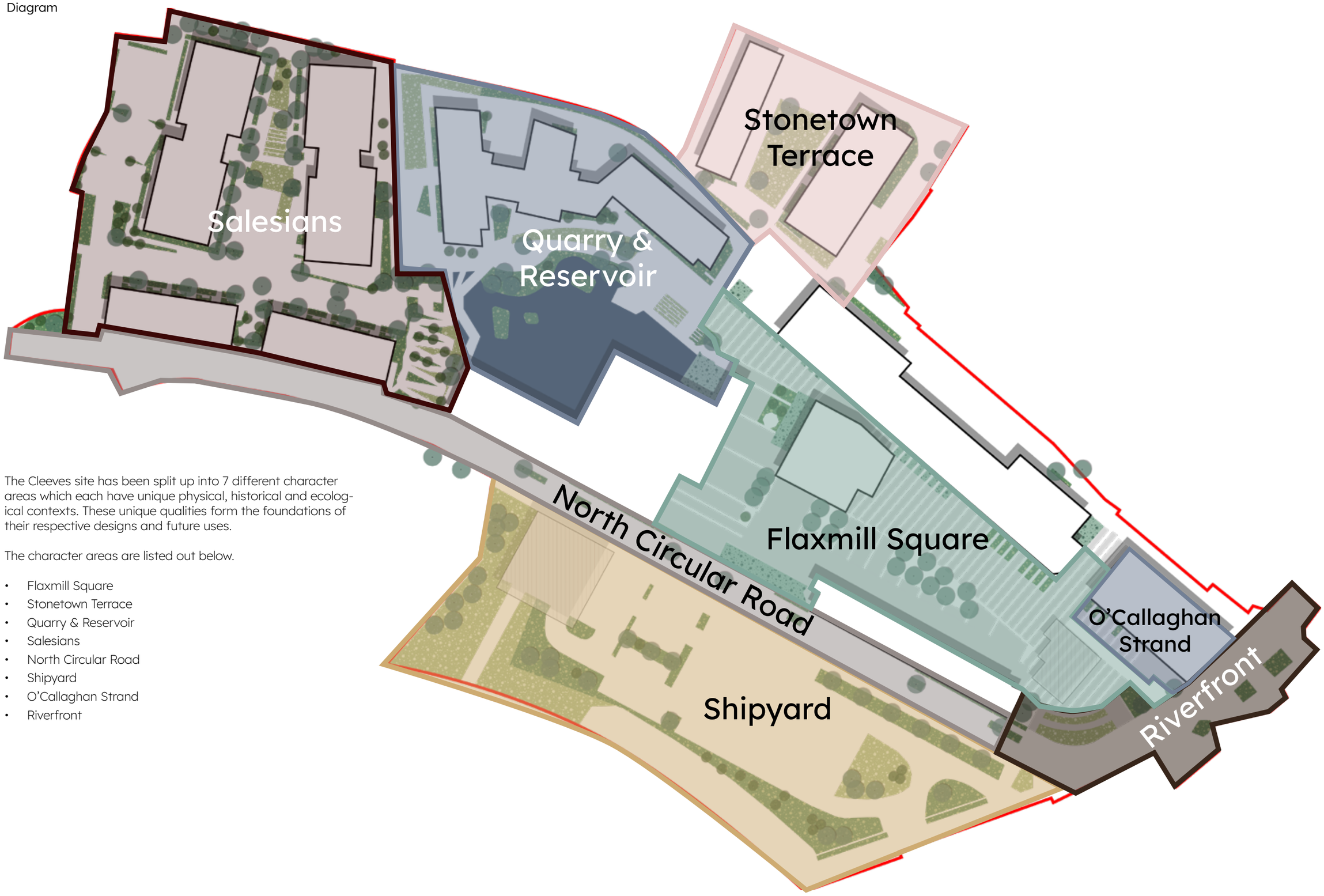
Benefits of GBI from the Limerick City and Environs Strategy

Drivers and Benefits of GBI in Limerick

4.0 Proposals

Character Areas

Diagram



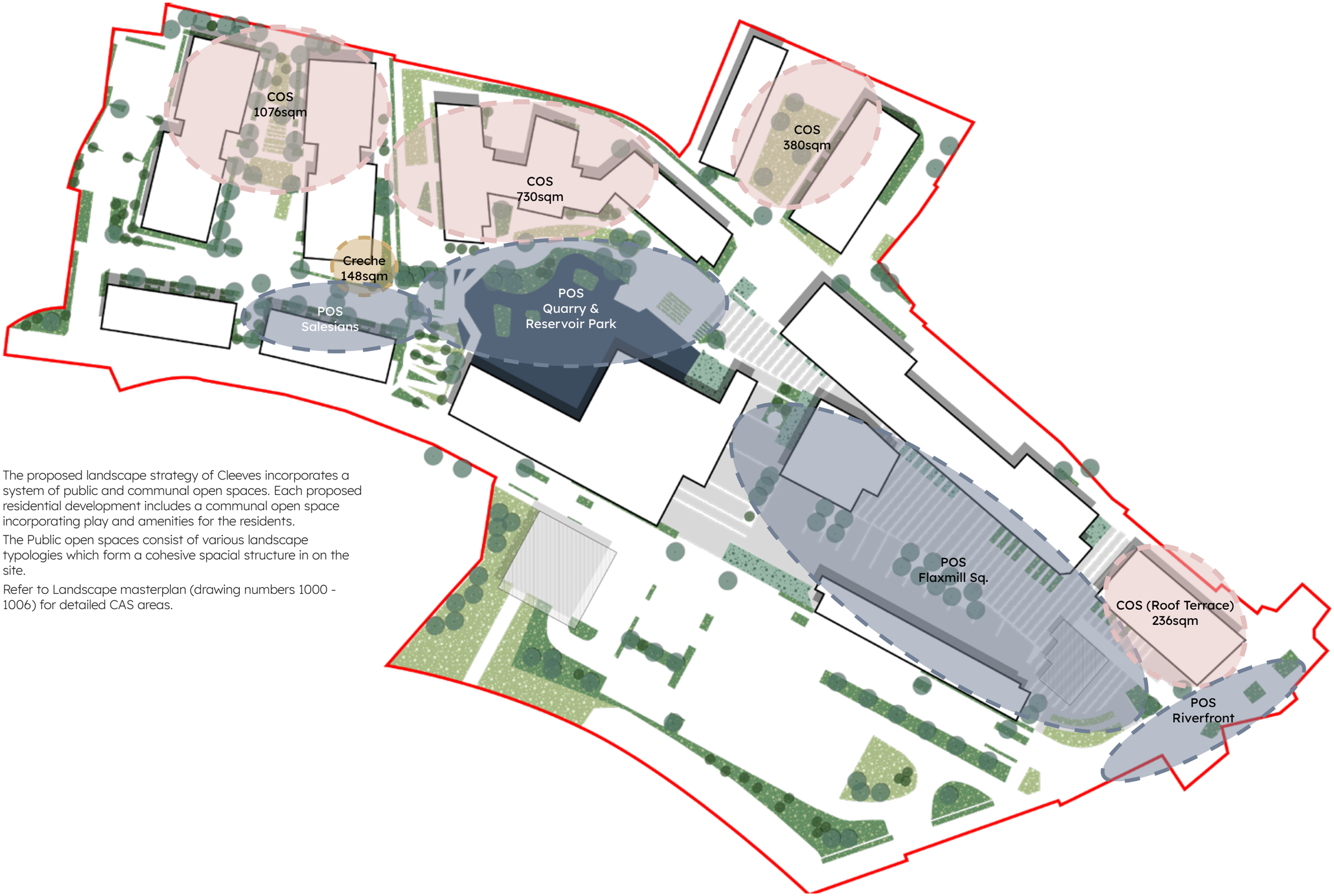
The Cleeves site has been split up into 7 different character areas which each have unique physical, historical and ecological contexts. These unique qualities form the foundations of their respective designs and future uses.

The character areas are listed out below.

- Flaxmill Square
- Stonetown Terrace
- Quarry & Reservoir
- Salesians
- North Circular Road
- Shipyard
- O'Callaghan Strand
- Riverfront

Open Space Strategy

Communal and Open Space Strategy Map



The proposed landscape strategy of Cleeves incorporates a system of public and communal open spaces. Each proposed residential development includes a communal open space incorporating play and amenities for the residents.

The Public open spaces consist of various landscape typologies which form a cohesive spacial structure in on the site.

Refer to Landscape masterplan (drawing numbers 1000 - 1006) for detailed CAS areas.

Play Map

Playful Recreation and Amenity

Communal Play Areas

Flaxmill Square

The significant city scaled civic space associated with the Flaxmill is envisaged as a dramatic open square, allowing spatial scale and distance to appreciate the Flaxmill building. This also allows for large scale flexible use of the central area. However, its success will depend on the ability to inhabit the perimeter in a comfortable way. The implementation of shelter under both architectural and tree canopies to the south western sides allows the sense of a retreat to shade and shelter. The alignment of the canopy, trees and planting traces a direct connection between river and reservoir as an important green infrastructural line of planting, raingardens and civic amenity. Give space to the historical frontage of the Flaxmill to stand out - open plaza, connected to the other public spaces, yet spatially defined.

The Flaxmill Square has the potential to become an important space for city events and a cultural hub, and therefore it needs to remain flexible enough to accommodate large gatherings. The placement of the performance stage under the riverside canopy will allow for an estimated standing capacity of around 4,000 people, with the tree canopy positioned high enough to ensure clear views of the stage. With the strategic use of video screens, the space could also serve official or municipal occasions. Playing into the plaza, the height of the surrounding buildings should help mitigate noise for the locality. At the same time, the design aims to maintain a lively atmosphere and a human scale even when no events are taking place, through the use of well-scaled spaces and detailed elements such as tree planting, seating, water features, lighting, furniture, and paving. Providing active frontages — both through interim uses and future development — will allow cafés, restaurants, shops, and exhibitions to spill out into the square, reinforcing its role as a vibrant civic destination.

The design intent is to utilise and enhance the microclimate. The proposal capitalises on the sunny exposition of the Flaxmill, with tree planting along the shadier south western façades as part of the Green Infrastructure Strategy. The wind mitigation is achieved through a combination of capitalising on existing building orientation, facade treatment and landscape features.

The scheme aims to reflect the character of the industrial heritage, maintaining or reusing artefacts such as paving and metalwork where appropriate. Likewise, the characteristics of the colonising planting will be curated to maintain a sense of nature taking hold of a post-industrial environment. Whilst this may be most relevant to the quarry and reservoir areas to the northwest, the Flaxmill landscape is not intended to become over sanitised and pristine. Colonising planting is supported by the use of permeable materials, crushed aggregates from site, lime mortars, limestone gravels, and sand.

Place de l’Hotel de Ville Gondrecourt le Chateau

TU Dublin Grangegorman Campus, Dublin

Flaxmill Square

The aim is to temporarily green the Flaxmill plaza until the next phases are realised, while providing a meaningful and creative space for people to meet and interact as well as opportunity for events, pop up café space, workshop space as well as a space for education. For that purpose, a temporary tree and shrub plants nursery will be created with temporary seating. The selected trees will be then planted in the final stage on the Flaxmill plaza and Shipyard. A theme will be selected for the planting including edible trees and shrubs, native trees and shrubs, and trees and shrubs that can provide materials for crafts, such as willow or plants used for natural pigments and dyes. This will create an opportunity for education and school trips or creative workshops.

Precedent examples:

Quai des plantes, Nantes, France (2018 until today)

At Quai des Plantes, a temporary nursery with a diversity of trees and plants that are to be used throughout the city of Nantes. A seasonal café/ bar can be also found here with diverse temporary seating opportunities. The trees are grouped in different areas per different themes: the local species square, square of magnolias, square of drought tolerant trees, square of wetland trees, Square of fruit trees etc.

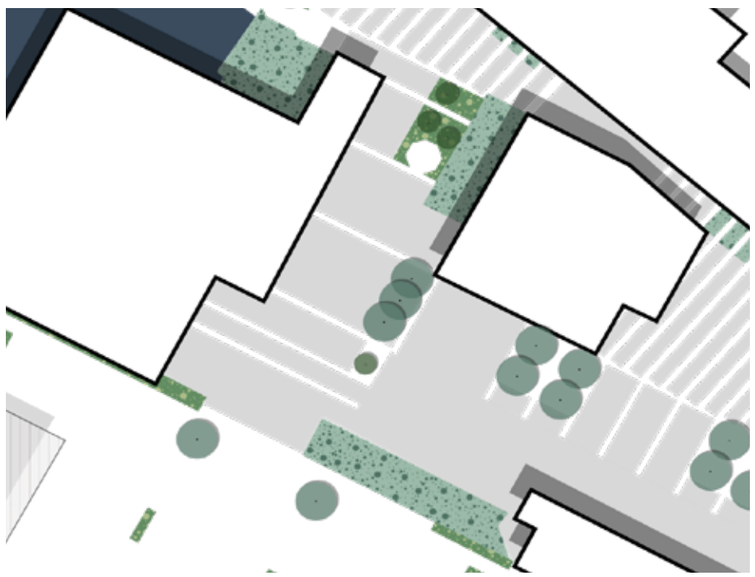
Baumschule Kulturforum, Berlin, Germany (summer installation 2023)

A temporary tree nursery in the cultural centre of Berlin aiming to provide a space to meet, linger, discuss, aiming to sustainably improve the quality of the time spent on the Kulturforum and enable a new view of the cultural quarter.

The Garden of Soil (R)evolution, Chaumont sur Loir, France – Festival garden April- November 2020

Temporary garden for the international garden festival with edible trees, shrubs, climbers and groundcover plants by Mitchell+Associates.

Reference images top: Quai des Plantes, Nantes
Reference bottom left: Garden of Soil (R)evolution, Chaumont sur Loire
Reference bottom right: Baumschule Kulturforum, Berlin



Quarry & Reservoir

The Quarry, with its dramatic walls and reservoir form a unique space in the city. It reveals the geology and topography of the city, and the alignment of the river, and is expressive of the development of the cultural heritage of the site; as the quarry was excavated, the buildings were built from the stone. both the reservoir and the quarry walls enclosing the space define its unique character and need to be remain visually connected within the open space of the quarry area, and through to the Flaxmill. The masterplan also opens up a new view from the Flaxmill Square across the reservoir to the quarry walls.

The quarry area is a sun trap sheltered from the wind, making a warm, sheltered - and quite rare- microclimate in Limerick, that is maintained and used. Where shading takes place the scheme creates lush damp spaces. However the reservoir edge is developed as a terraced area down to the water's edge, facing south. This unique public park, includes a play space with a special character relating to the cultural and natural heritage of the site.

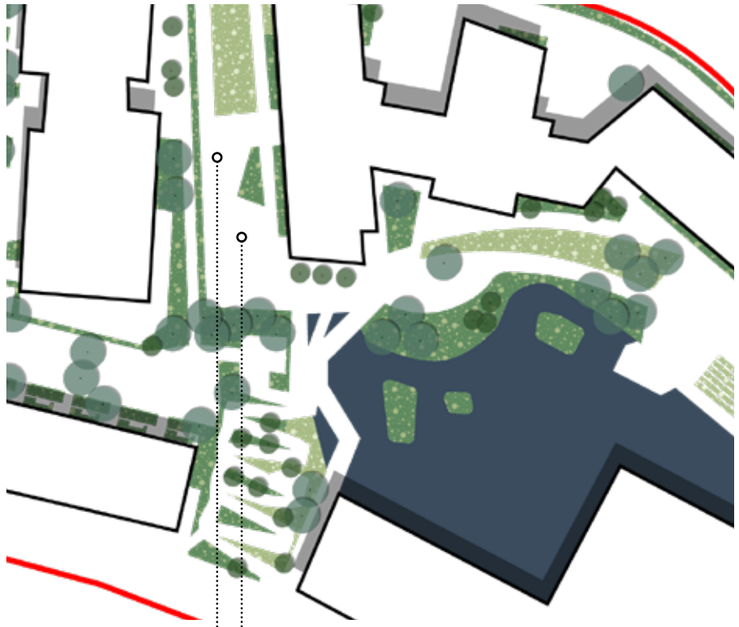
The lower reservoir and quarry floor levels connect to the upper quarry and Salesians site some 6-8 metres higher via a stepped structure connected to the quarry wall and reservoir. A boardwalk, along the western edge connects to a new entrance to this park on the North Circular Road – from where a sloped path gains access to the upper levels. This give a 'look-out' on the promontory at the Salesians site. The staircases give an opportunity to experience the quarry wall at close hand..

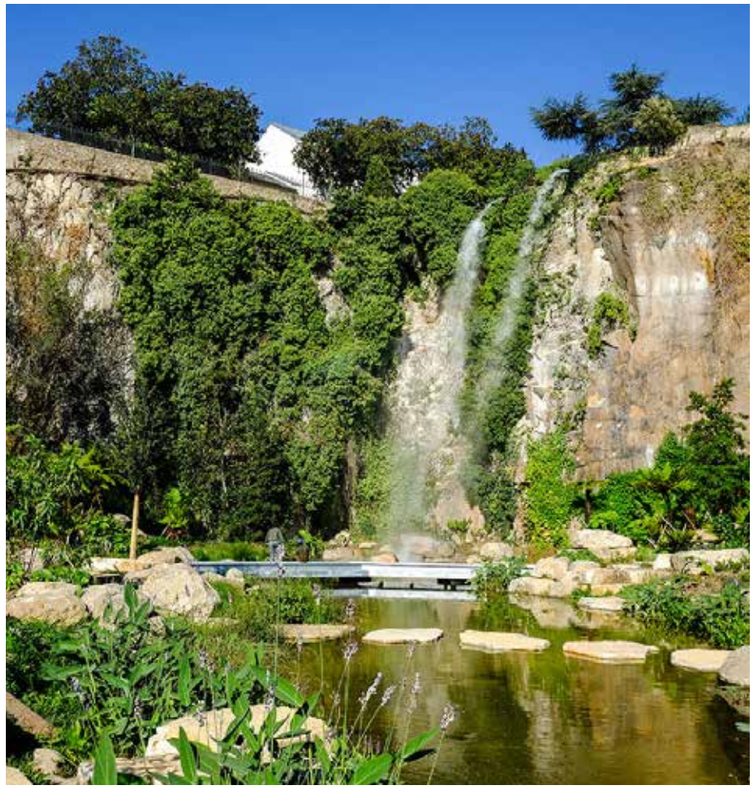
The development of early access to the quarry and reservoir edge, along with other meanwhile uses across the site, would will enable the public to use the dramatic spaces and allow the biodiversity to begin to be managed. Japanese knotweed is present on site and is being managed through the injection of herbicide. The quarry face is overgrown with the invasive Old Man's Beard (Clematis vitalba), and ivy which also requires management on site. The proposal, developed with the ecologists and engineers is to carefully remove invasive and woody vegetation, including buddleia, in order to determine the stability of the rock face, and allow controlled re-vegetation, leaving one north facing section available for rock climbing.

The submerged piers within the reservoir are proposed to be removed – with some potential for recycling any possible stone elements in to the scheme.

Refer to the demolition Drawing no CRQMP-FCBS-ZZ-XX-DR-AA-1900

This enables the reservoir to become more accessible for recreation, with a defined area for habitats, including the introduction of floating islands to increase the surface area of riparian planting for enhance those habitats.




Jardin Extraordinaire, Nantes


North Boulder Park, Boulder

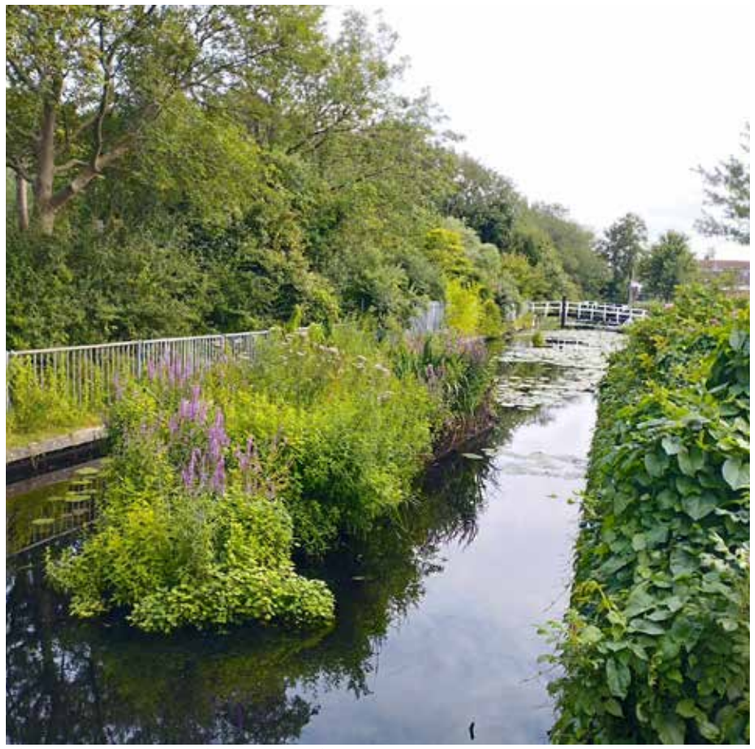

Quarry Park, Rocklin


Jardin Extraordinaire, Nantes

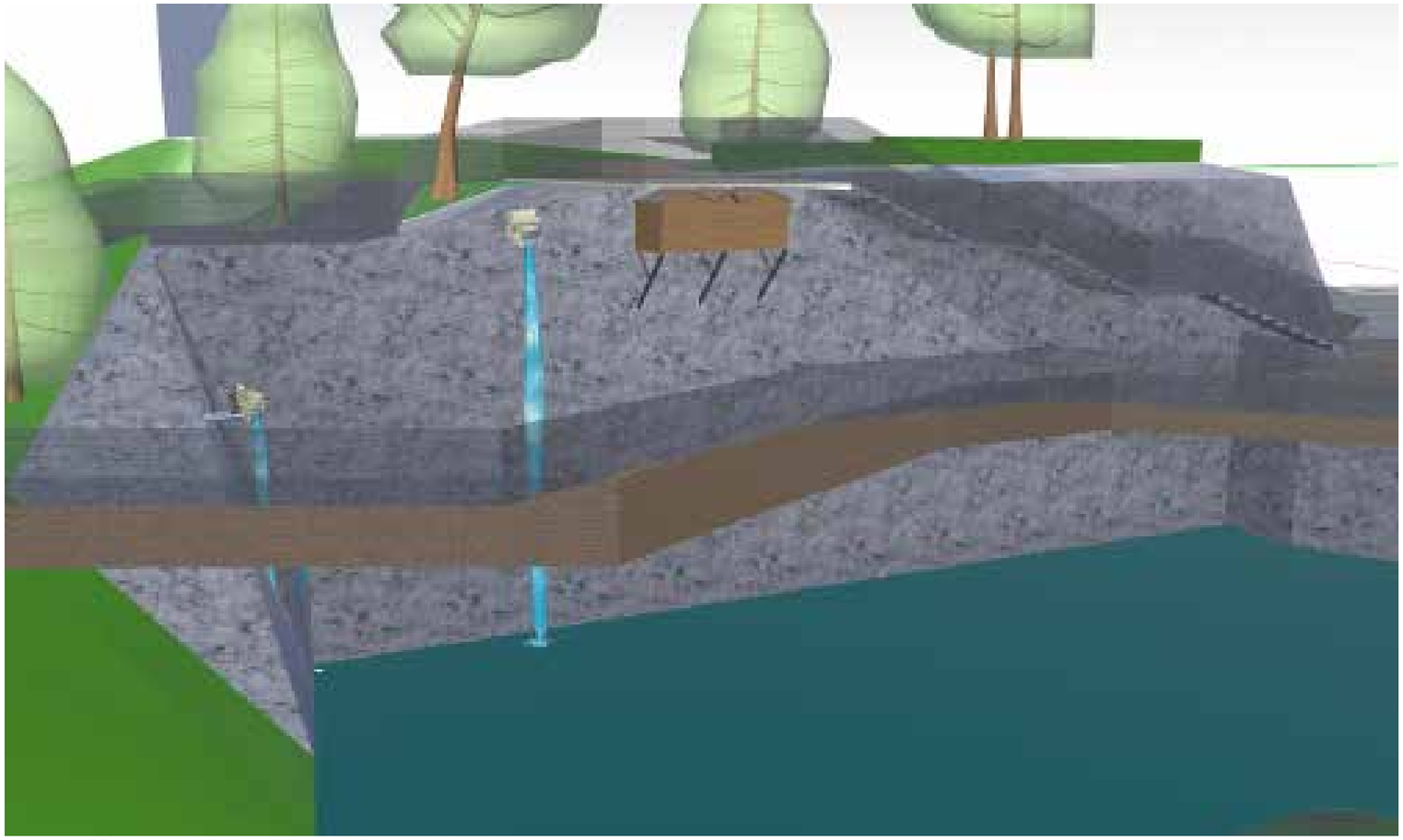
Quarry & Reservoir

This approach is used throughout the site as access to the river, access from the riverfront to the Flaxmill plaza, and access to the reservoir. The aim is not to only create a connection and access but also to provide seating opportunities and a place to stay.

Interface with reservoir

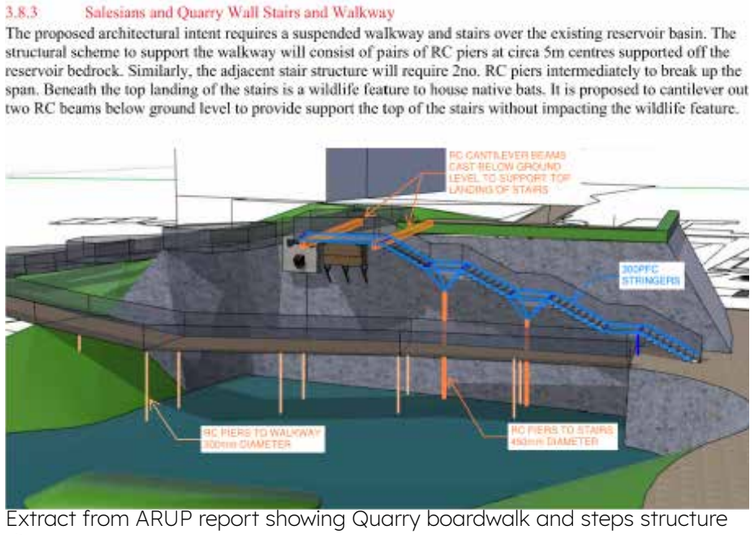


Floating constructed island, Leiden



Concept 3D model of Quarry Wall and Reservoir interface

Kayaking

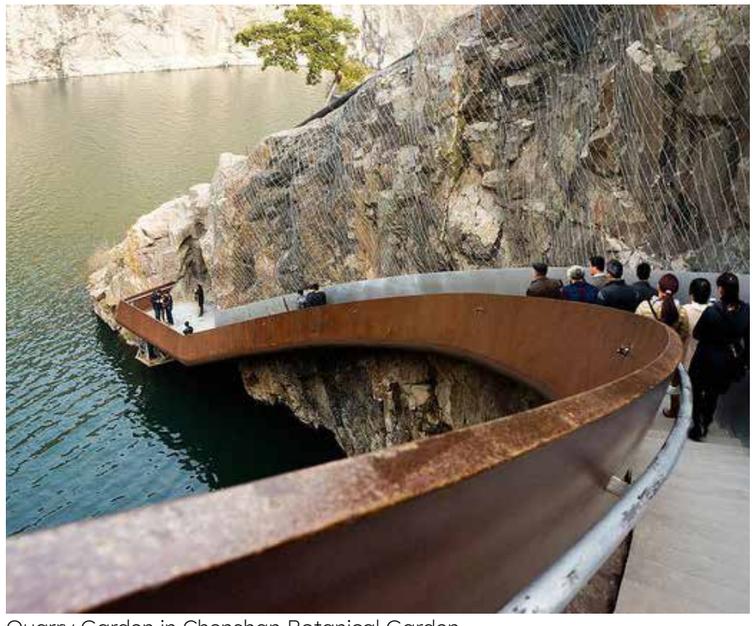


Extract from ARUP report showing Quarry boardwalk and steps structure diagram

Salesians

The form of the Salesians site is driven by the constraints of vehicular access and the relationship with neighbouring residential areas. It is a distinct enclave that is connected across the quarry level change to the lower areas that contain the public open space amenities as part of the overall masterplan . However the upper area also includes public open space, with bike parking and a play space (approx. 85sqm) for young children – designed to be in proximity of the creche. The public space is punctuated by a promontory, with a dramatic view across the rest of Cleeves Riverside Quarter, the chimney, Flaxmill and towards the city centre across the river. The communal open space at Salesians consists of a central courtyard, and a perimeter amenity path along the quarry edge. The relationship of communal spaces and architecture ensures enough privacy while creating active communities allowing visibility from private patios onto the communal courtyard. The central open space terraces northwards as a playful green space, incorporating toddlers play for the direct use of the residents. older children will be able to play informally across the terraced space, and access more formal play in the quarry area as part of the masterplan provision. The perimeter spaces are accessed infrequently, and are therefore predominantly green. Though the space is limited for large tree planting, some screening is achieved, with potential for some walls in the scheme to be planted with climbing plants. Localised nature-based drainage solutions support the green infrastructure element in this part of the scheme. Its connectivity to the wider site - and the reservoir – has led to a creative and interesting solution to water management where the water spouts drip, dribble, or cascade in to the reservoir – depending on the amount of rainfall. This reinforces the aim to demonstrate sustainable water stewardship in the public realm.

The entrance to the Salesians from the North Circular Road is a significant approach to the entire Cleeves Riverside Quarter, and leads to the 'look-out' promontory across the site before descending in to the quarry either by the steps or the slopes pathway.



Quarry Garden in Chenshan Botanical Garden

Urban Physic Garden, London

Stonetown Terrace

The form of the Stonetown site is driven by the constraints of vehicular access and the relationship with neighbouring residential areas. It is a distinct enclave that is connected across the quarry level change to the lower areas that contain the public open space amenities as part of the overfall masterplan . The communal open space at Stonetown consists of a central courtyard, and a perimeter of garden spaces and buffer planting – some of which incorporates nature based SuDS.

The relationship of communal spaces and architecture ensures enough privacy while creating active communities allowing direct access from the front doors for the townhouses, and the entrance lobby or the apartments onto the communal garden. Play is achieved for younger children in the form of a playground of approx. 90sqm. Formal playspace for older children is located in the Quarry and Reservoir park which is accessed by a sloping route or via stairs along the quarry face.

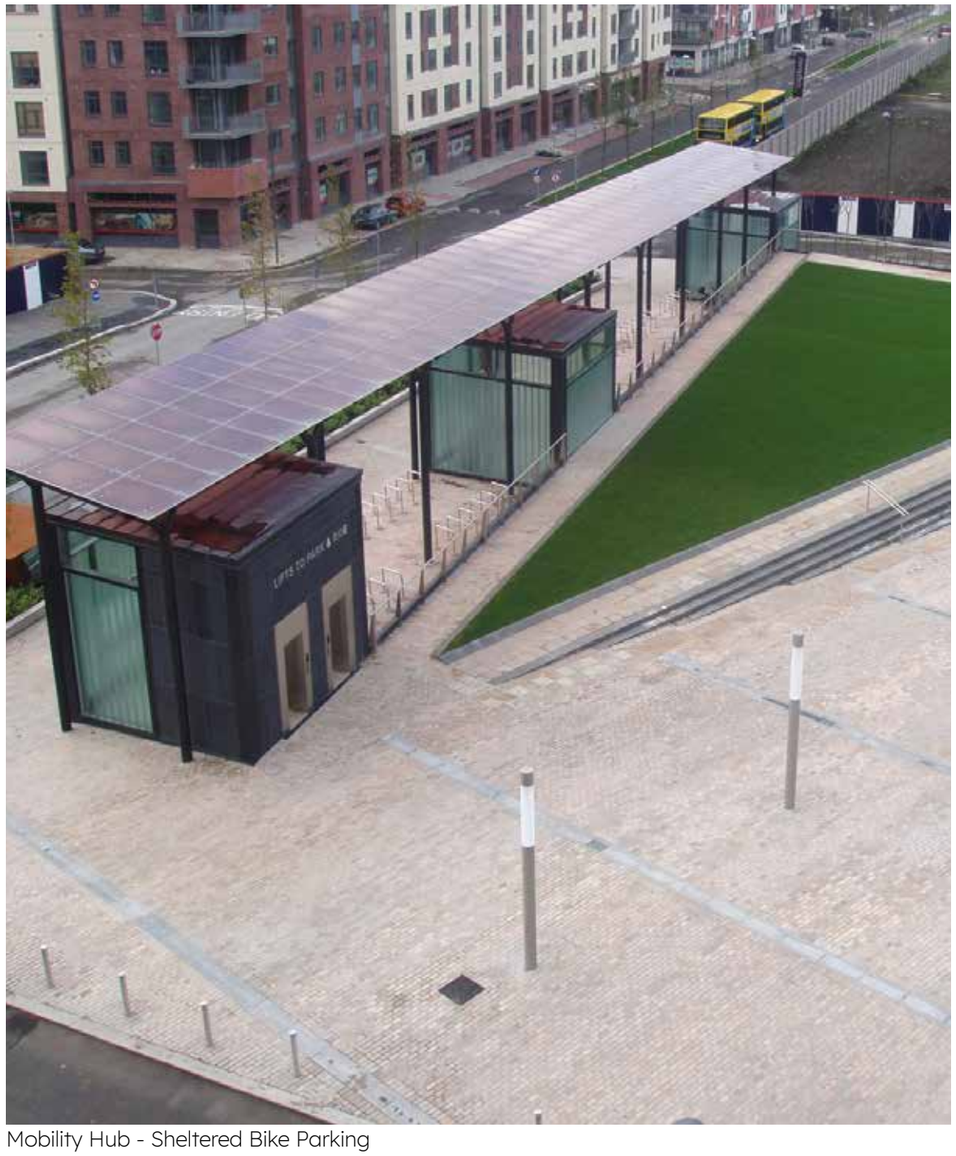
Localised nature-based drainage solutions supports the green infrastructure strategy in this part of the scheme. Its connectivity to the wider site – particularly the reservoir -leads to an engaging solution to water management, with a cascade at the base of the level change draining in to a rain garden. This reinforces the aim to demonstrate sustainable water stewardship in the public realm.

Water channels for nature-based drainage

Communal Amenity Space with amenity lawn

Shipyard

The Shipyard site and the raised embankments of Condell Road create a barrier in the city. The masterplan aims to reconnect the city to Condell Road through the Shipyard site and transform the road verge into a new street interface. The design proposal in this Phase 2 of the CRQ sets up the structure creating a green corridor link for wildlife on the northern boundary. The rest of the area is structured as a mobility hub, and areas for meanwhile uses framed by fast growing pioneer planting of birches and alders amongst swales.



Mobility Hub - Sheltered Bike Parking

Wildlife Corridor

Riverside

The river frontage at Cleeves is a significant place where the urban spaces meet the river. The aim of the masterplan is to bring people into contact with the river, enabling engagement with the water and create space for water sports, and gatherings. The design for the riverfront is a place where three different characters meet, so space must respond to create continuity. These spaces are:

1. the urban promenade of the quays,

2. the tidal and riparian edge of the estuary and SAC interface

3. the industrial heritage of Cleeves.

The design aims to integrate the three characters into the riverfront design, creating a continuity into the urban fabric.

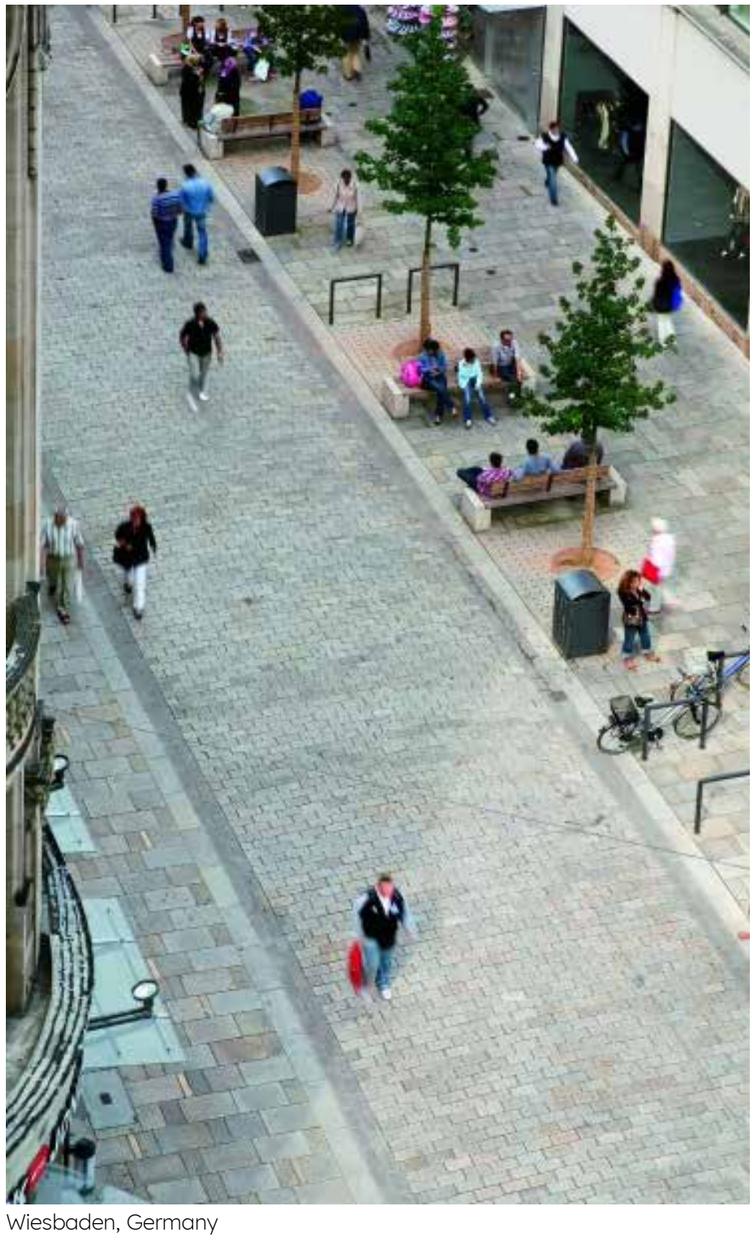
The proposed scheme shows adapted levels along the riverfront to manage flooding without creating a flood barrier. The increase of a step to the existing steps at the eastern end of the site and raising the junction with Stonetown Terrace creates an opportunity to add a folding flood gate, thus maintaining the access and permeable quality to the river. This strategy has been developed in consultation with the Flood Relief team, and will tie in with broader flood relief design further along O'Callaghan Strand. The existing public slipway and the private pontoon remain as access points to the river. The riverfront space itself is intended to function as an active space for managing boats. As such, the main space is a hard shared surface with minimal street furniture to avoid clashing with the manoeuvring of boats, as well as cyclists and pedestrians traversing the space. However it is flanked by the terraces leading towards the higher level of the Flaxmill Square and by the riparian tidal edge of the river. The space therefore remains as a biodiverse corridor, whereas the urban space is characterised as a place for recreation and amenity.

Landscape terraces

North Circular Road

The North Circular Road is proposed to be raised to facilitate access to the site during flood conditions.

The scheme proposes the street as a shared surface, facilitating parking drop off and loading, whilst incorporating nature based SuDs in the form of attenuating tree pits and swales. The proposed scheme has been coordinated with the Public Realm team in Limerick City and County Council in order to have a coherent palette of materials and detailing in the city streets.



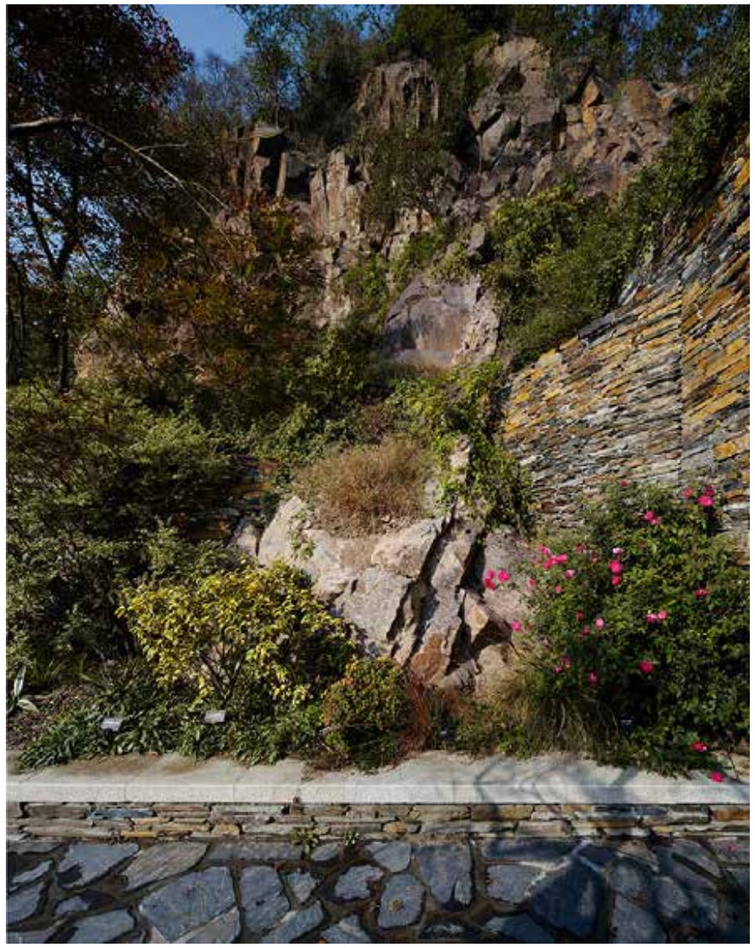
Wiesbaden, Germany

Prenzlau, Germany

Student Housing

The student housing is set back in to the Quarry and addresses the reservoir. The south facing communal open space is a lawn area for flexible, informal use. It is set approximately 900mm higher than the public open space, giving it a raised secure edge with a vantage over the public open space towards the reservoir. Two small roof terraces at first floor provide further elevated communal open space addressing the reservoir and open space.

The western edge addresses the quarry wall, beside which a fitness zone of exercise equipment is located. This is within the secure communal open space, and is situated close to the climbing wall area in the public open space, consolidating these two amenities. The design has been developed with the ecologist in order to balance the level of ecological enhancement of the quarry wall with its potential amenity. The north and west quarry walls remain as bat foraging routes, with advanced installation of a bat house in this location. The lighting has also been designed avoid disturbance of this habitat – with light poles at 4m and lower bollards illuminating safe routes for students.


Quarry Wall at Shanghai Botanical Garden


Fitness equipment at Student Hotel, Amsterdam


Student Housing amenity space

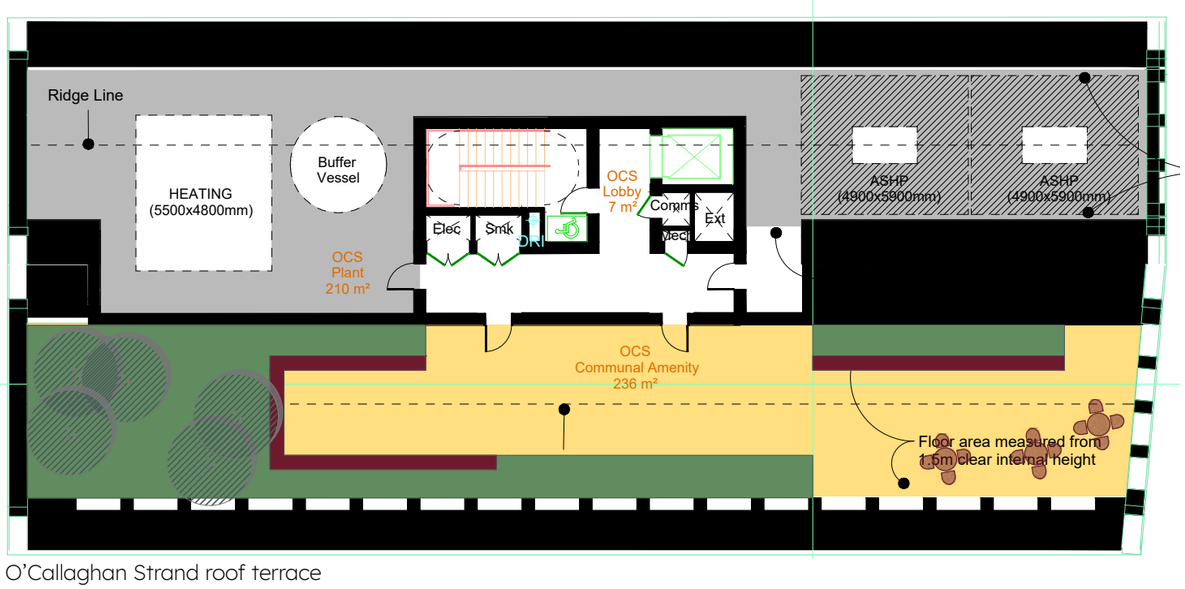
O’Callaghan Strand

The landscape design of the O’Callaghan strand roof terrace aims to draw users towards eastern end of the building where there are seating areas accompanied by a view of the River Shannon and western areas where there is shelter from the planting. The permeable roof design allows for planting to take up generous areas of the terrace, with small trees which will be visible from a distance.

Outdoor seating - Carton House, Kildare

Roof terrace - Crossrail Place, London

O’Callaghan Strand ground floor and public realm



O’Callaghan Strand roof terrace

5.0 Interpretation and Art Strategy

Promontory and Canopy Interpretation in Flaxmill Square

Limerick Twenty Thirty has ongoing engagement with the arts in Limerick, hosting events on the Cleeves Riverside Quarter site. The proposed scheme facilitates this relationship, specifically providing a canopy that will facilitate events. The landscape design has opportunities to engage with artists for physical artwork, including the interpretation of the legacy of the Salesians at Fernbank, and in the interpretation of water stewardship in the water spouts at the quarry walls.

Public plaza with events canopy as Grote Markt Vilvoorde, Belgium by OMGEVING Landscape Architecture

Commemorating Salesian Sisters at Fernbank

Salesian Sisters

The Salesian Sisters commenced educating young women and girls in Limerick in 1920, and established their base at Fernbank in 1924, from where they continued a tradition of education in the city lasting nearly a century. Education and other ministries by the Salesian Sisters continues, always with a special focus on women and young people.

Commemoration and Sense of Place

There are many potential ways to commemorate the presence of the Salesian Sisters at Fernbank; in publications, artwork and literature. For the site itself, the proposal is to draw a theme relating to the Salesian Sisters' ethos in to the landscape design, reinforcing the understanding of heritage on this unique site, and generating a sense of place.
The proposed public route that rises in a series of sloped paths and resting points culminates in a promontory with a viewing point looking across the reservoir and Flaxmill and the river Shannon towards the city centre. This pathway ascends through proposed trees, amongst banks of woodland flora – including ferns. It accommodates key references to the Salesian Sisters and their presence at Fernbank in the design.

Make yourself loved, not feared.
Example of a Salesian Sisters motto that can inspire interpretation of their legacy.

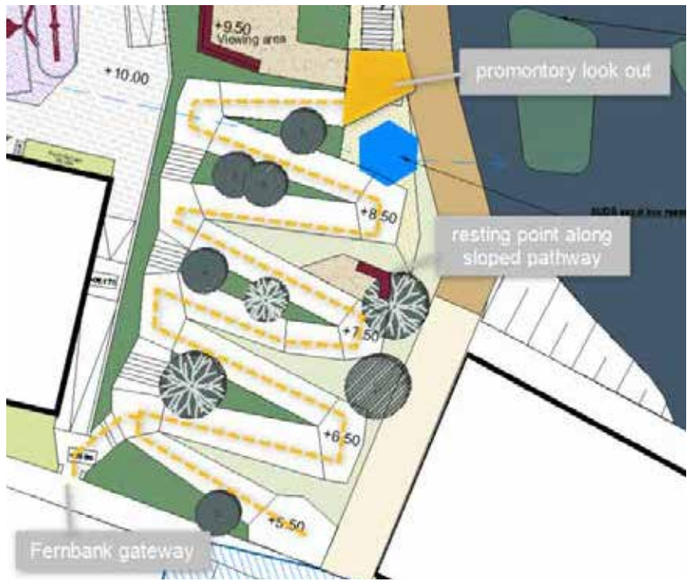

Fernbank


Inlaid Interpretation


Fernbank gateway


Ferns unfurling

Carved interpretation

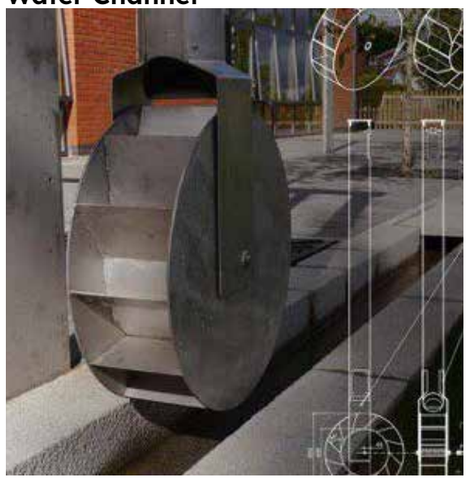


6.0 Water Management

Nature based SuDS

Closely allied to natural heritage and the existing ecology on and adjacent to the site is the presence of water in the form of the reservoir, wetlands and the river Shannon. The sustainable management of water aims to slowly deliver clean water to ground and water courses, or recycle it as harvested rainwater. Creating nature-based solution in the form of raingardens, swales and sheughs enhance habitats and generate biodiversity – in this instance developing a correlating wetland and riparian habitat with the local context. Exploring the expression of water management in playful detailed design through visible surface channels, water courses, and discharge from roofs will help people understand and celebrate the importance of water.

Water Channel



Robert Bray Associates - Bewdleys School

Tree Pits

Channel Covers

Pipes and outles

Floating islands

Phytoremediation

Floating islands are a method to clean water with accumulated nutrients such as nitrate and phosphorus (eutrophication), or even more severe contamination such as volatile organic compounds, toxic heavy metals, microbial contaminations or pharmaceuticals. Certain plants are especially effective in reducing nitrogen (such as varieties of bulrush), while others are effective with reducing for example heavy metals (colonial bent grass for cadmium and mercury and sunflower for arsenic for example). All plant are effective to reduce phosphorus.

The plant roots absorb nitrogen and phosphorus directly from the water and use them in their biomass. The timing of plant harvest is crucial to efficiently remove the nutrients and has be done before the start of vegetation decay but has to be in agreement with nature protection guidelines. Even without biomass removal, remediation takes place. Only 10% of the phytoremediation is however done by the plants themselves,

The rest is done by microorganisms forming a biofilm on and around the island's matrix and in the root zones of the plants, creating a symbiotic relationship with the plants by providing available nitrogen and taking CO2. The biofilm furthermore serves as food source for zooplankton and fish.

Biodiversity

The best practice is to use native and non-invasive perennial species, alternating plants instead of using monocultures, and offering diverse plants to attract more species. Native wetland flowering plants can be used to enhance biodiversity and provide additional habitat that will be attractive to wildlife, from insects and pollinators, birds, fish, to even mammals. Floating wetlands can lead to more diverse fish and invertebrate species providing food as well as shelter. By placing the islands further away from the banks, they offer attractive resting and nesting places for birds.

Matrix material

The right choice of material for the matrix of the island depends on the conditions and can vary from (recycled) plastic grids and foam such as Polyurethane foam (PU), High density Plyethylene (HDPE), UV-resistant LDPE, recycled PET, to steel and organic materials such as stainless steel and reed stems, or wood and cork. In this instance, the islands are relatively protected from strong current or waves during flood, storm, and tidal events. Plastic free organic and sustainable materials that are chemically inert and rot-resistant are selected here for a safe, durable, aesthetic, and cost-effective solution.

A combination of buoyant mattress of stainless steel gabion mattress made of glass gravel and covered with coconut fabric with integrated organic materials to improve water quality and support vegetation such as xylitol fibers (charcoal wood - high adsorption rate of P and N and fast colonisation by microorganisms) and coconut chips (for better development of roots), with a reed mat on top of the mattress is recommended, pending further detailed design.

Improving water quality while enhancing biodiversity
Picture above by Oekon AquaFlora

Precedent: Floating island Kind's Cross Regent's Canal, London

Stonetown Terrace SuDS

There is potential to transfer surface water from Stonetown terrace into the quarry through a series of stepped channels town the face of the steps. This would then be delivered into a nature based SuDS feature at the bottom before ultimately either being delivered into the ground or into the quarry reservoir.

This solution would make the movement of water into an attractive feature on the site and would help to educate the public on sustainable water management.

There are nature-based SuDS features at the upper level to slow the flow capacity. The discharge pipe feature a baffle to prevent overshooting and regulate the flow.

The proposed steps leading from Stonetown terrace to the Quarry will include a system of channels that will direct water to a raingarden below in a visually interesting manner, re-purposing materials salvaged from the site. The channels and support beams will re-purpose I-beams where possible from various locations throughout the site. These will be modified and perforated in areas to increase the visual interest of the water flowing down to the planted area. Salvaged rocks and boulders will also be strategically placed in the raingarden to slow the falling water and to provide an audible sound when the water falls on them.

The steps will have a steel railing and handrail to provide visual permeability to the water management system. This will connect to the balustrade at the top of Stonetown terrace.

The lower part of the elevation consists of the existing stone quarry wall while the upper parts will be new stone walls.

3D Concept model of Stonetown water management system

Salesians and Quarry wall

The relationship between Salesians and the quarry will be addressed through the use of board walks ramps, steps and other methods with the aim of seamlessly tying the adjacent spaces, people and ecology together. The quarry wall will include a set of steps hung from the wall itself to move people between the reservoir and Salesians.

Under the steps to Salesians, it is proposed to include a large bat house, as well as a water feature. Surface water in Salesians will be delivered to a chamber which will discharge it into the reservoir below through a feature spout. I times of heavy rain, additional water will be discharge through a large slot above.

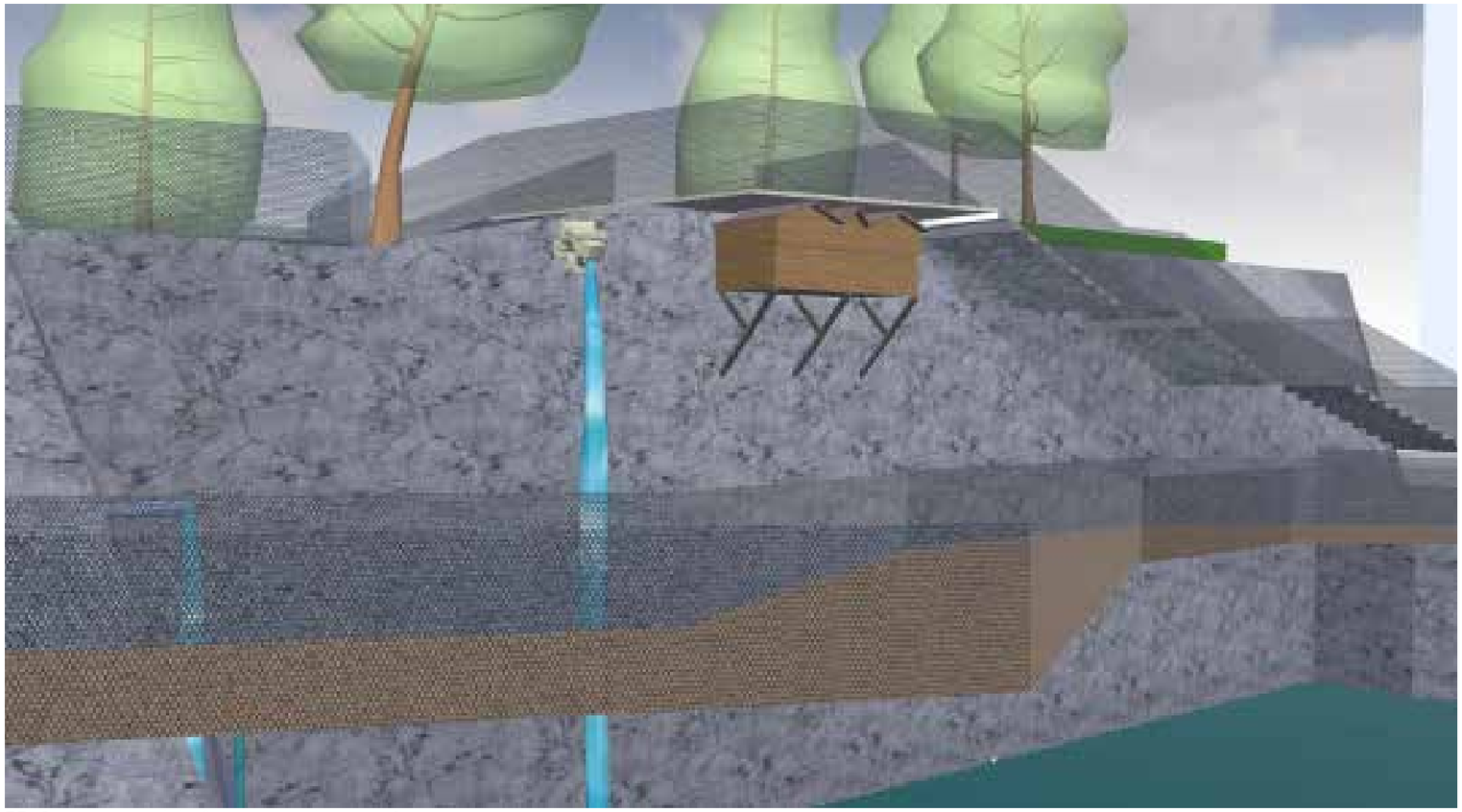
A series of metal ramps and steps will lead from the Fernbank entrance to the top of the quarry wall where there will be an attractive viewing point over the reservoir.

The materials have been chosen for lightness and visual permeability. Timber and steel will be used for the boardwalk, steps, ramps and balustrades.

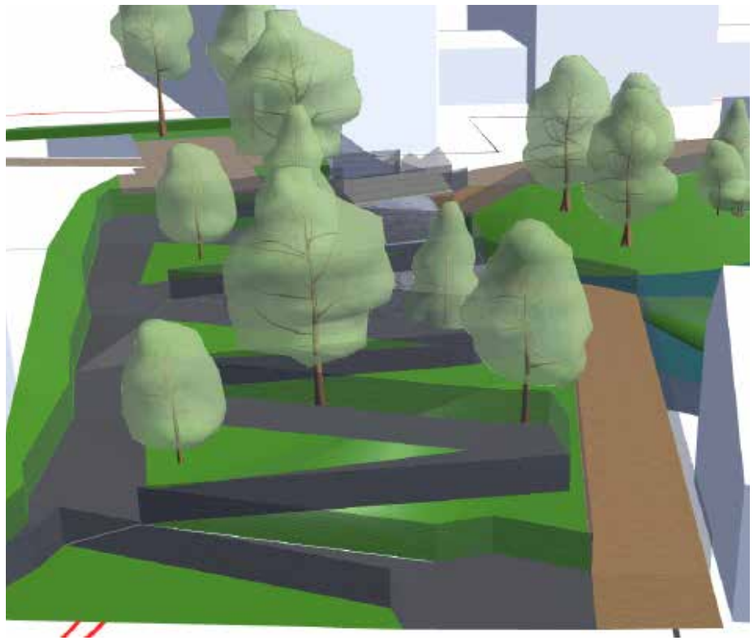
There will be a total of 3 bat houses across the site. These are indicated on the landscape masterplan and are positioned to follow the existing bats flight paths - refer to ecology reports.

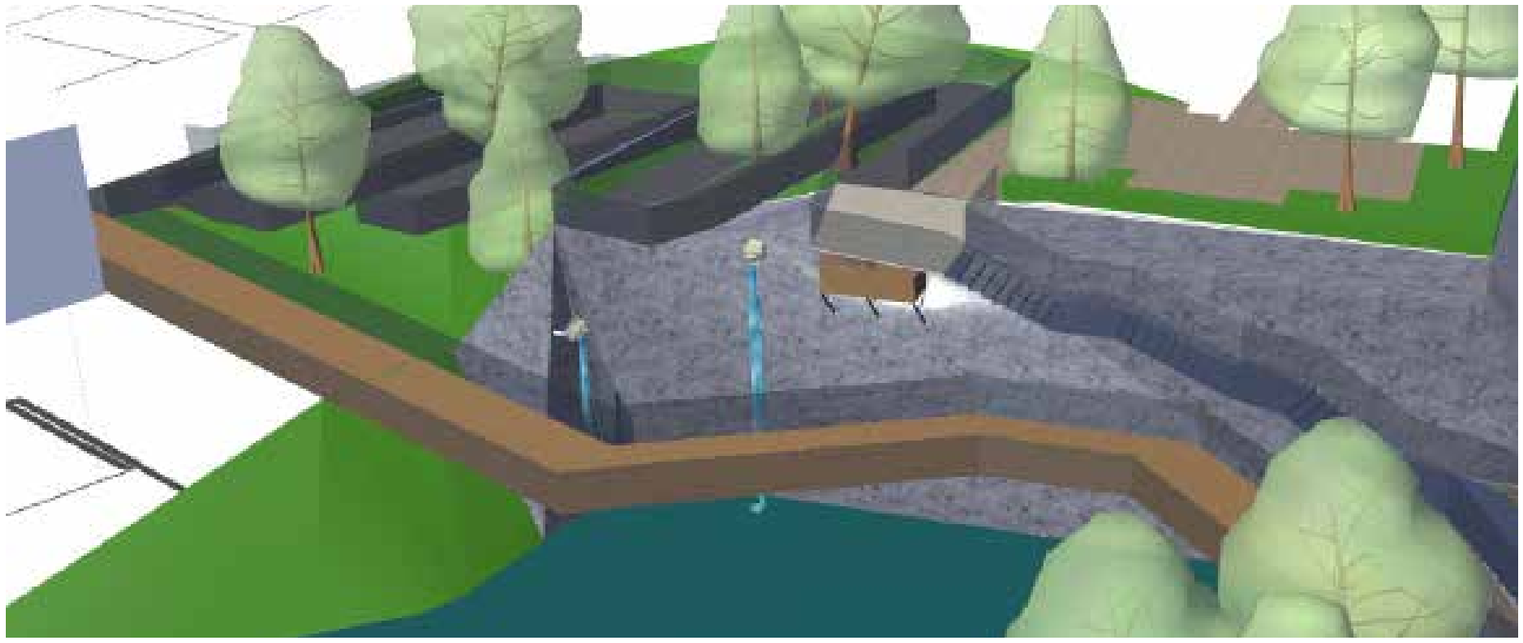
Other bat boxes and swift nesting boxes will be provided in association with the proposed buildings. The existing quarry face also provides potential habitats for swifts and bats.

Refer to ARUP structural drawings for boardwalk and staircase.



3D Concept model of quarry and reservoir

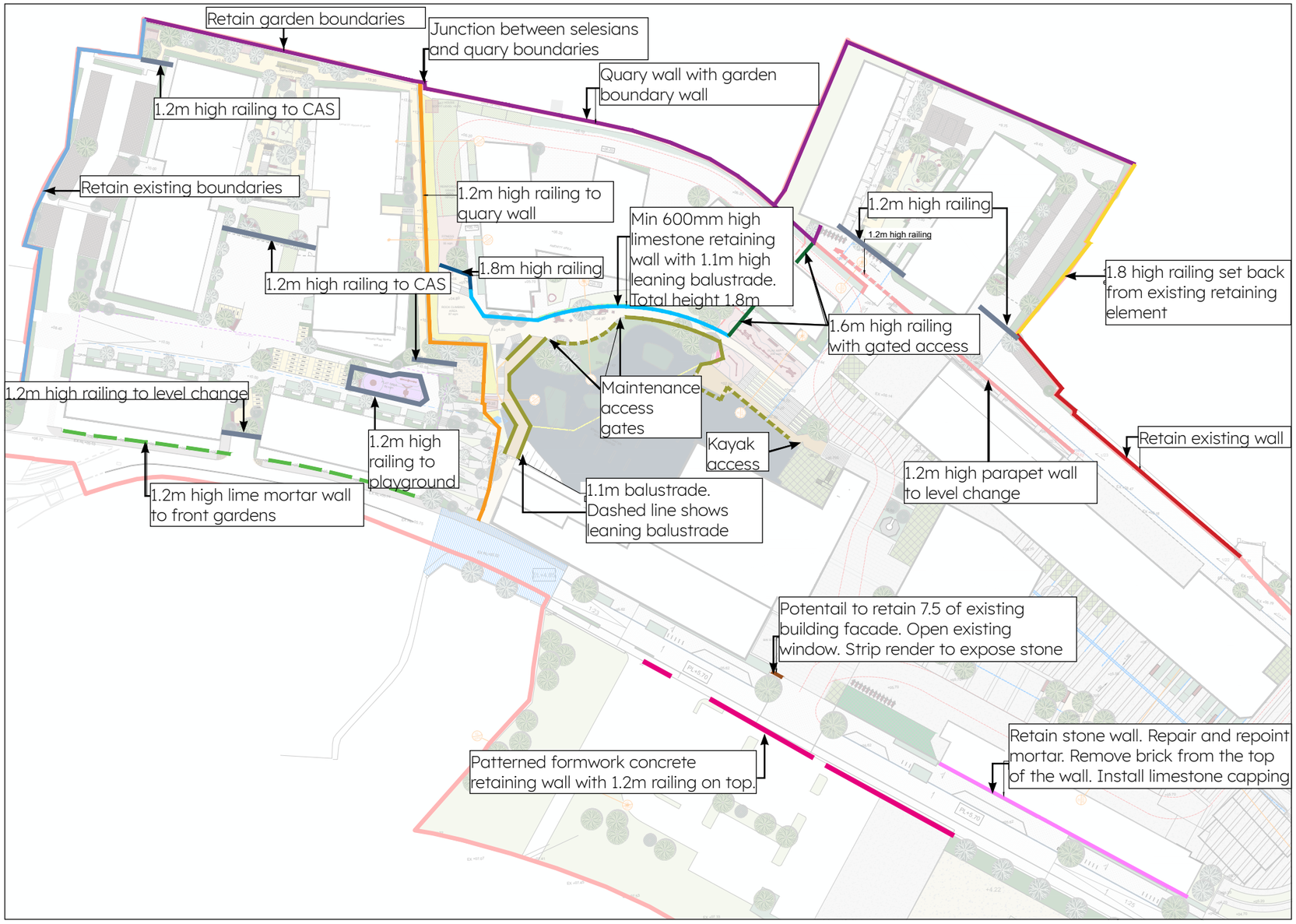




7.0 Boundary Treatments

Boundary Typologies

Boundary Diagram



Leaning Handrail to water features and viewing points

Image Above:
Mitchell + Associates
Dundrum Town Centre

Image Left:
Tract Consultants
Saltwater Coast

Limestone retaining wall with 1.2m ballustrade

Image Above:
Flannery and Sons Landscaping

Limestone Mortar wall to North Circular Rd.

Image Left:
Mitchell + Associates
Kilkenny Riverside Gardens

8.0 Hardworks

Recycled Materials

There is currently an abundance of high-quality and visually attractive materials on the site which can be reused and recycled in the proposed scheme. The landscape plan incorporates some of these materials as a method of preserving the cultural and industrial heritage of the site. The materials that have been chosen to recycle are durable and long-lived elements of the existing architecture which will improve the visual amenity of the space while.

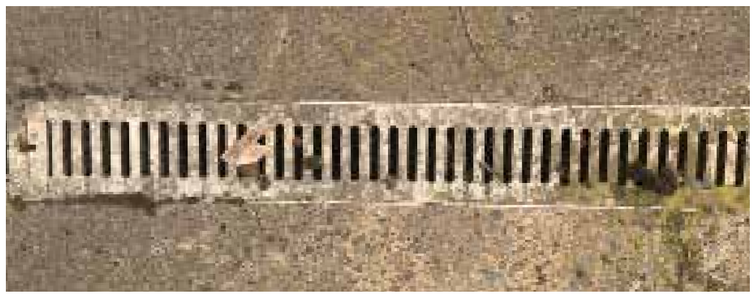
I Beams
I Beams are proposed to be recycled as water channels for nature-based drainage in locations such as the Stonetown Terrace water cascade system

Corrugated metal sheeting
This can be reused as cladding and roofing in various locations such as the bat houses

Downpipes and Hoppers
Downpipes are proposed to be recycled in the Stonetown Terrace water cascade while hoppers can be used in roof drainage for the proposed buildings, or as decorative wall-mounted planters.

Decorative Concrete Blocks
These concrete blocks can be used in the gravel areas in Flaxmill Square as recessed pavers in the aggregate surface.

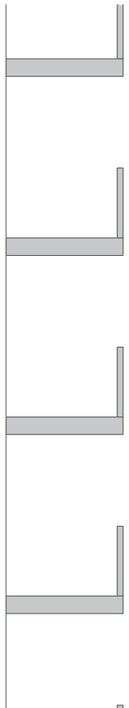
ACO Drain Covers
Steel ACO drain covers can be reused from various locations throughout the site to serve the same purpose in the proposed scheme.



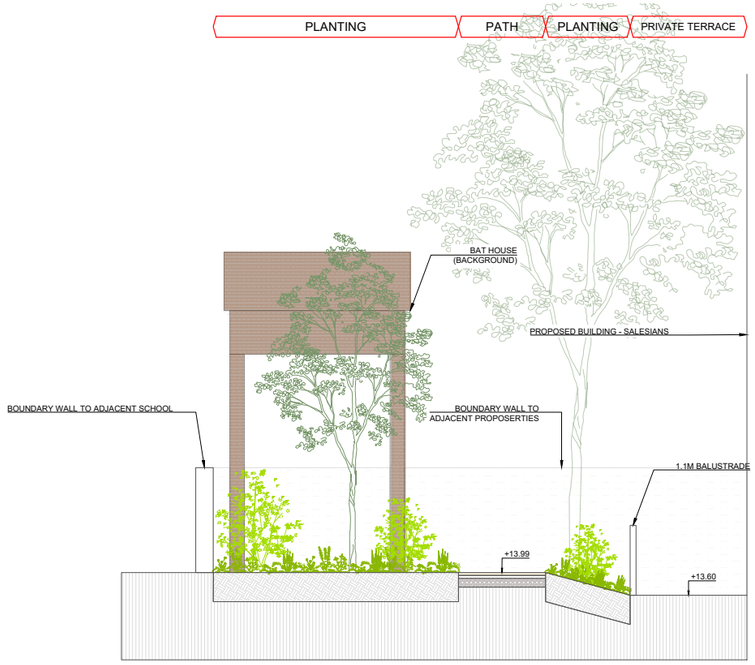
Drain Covers
Decorative drain covers are proposed to be recycled while traditional covers can be reused in raingardens and swales

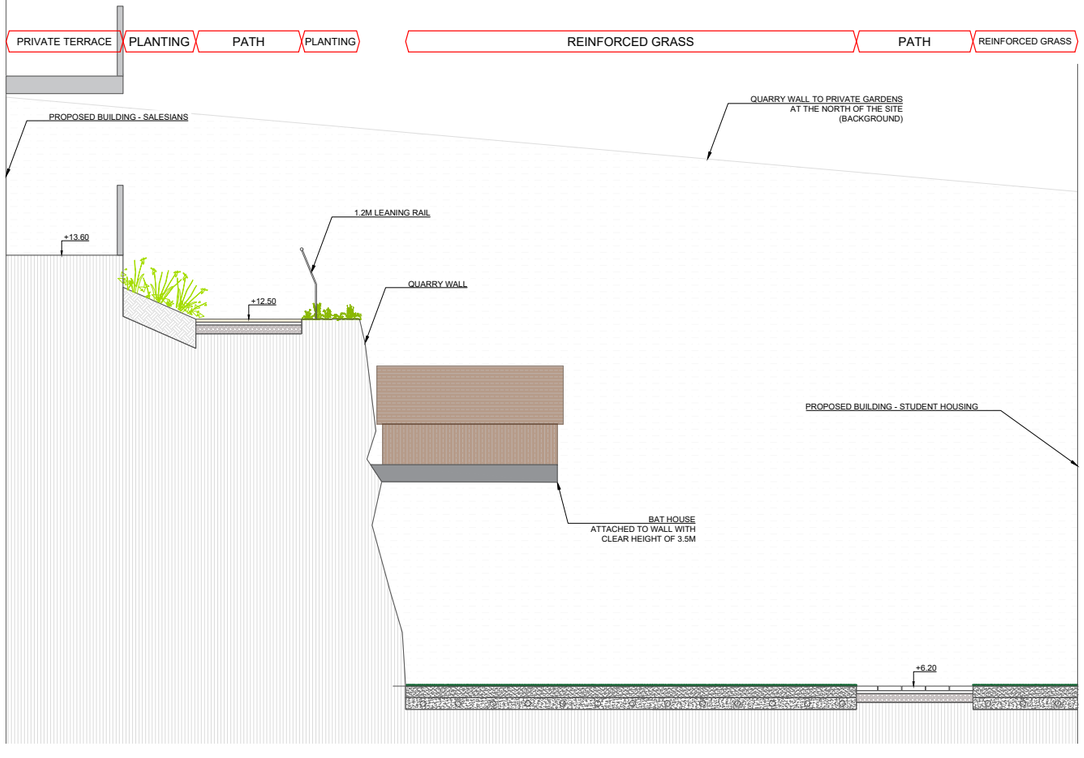
Ancillary Structures

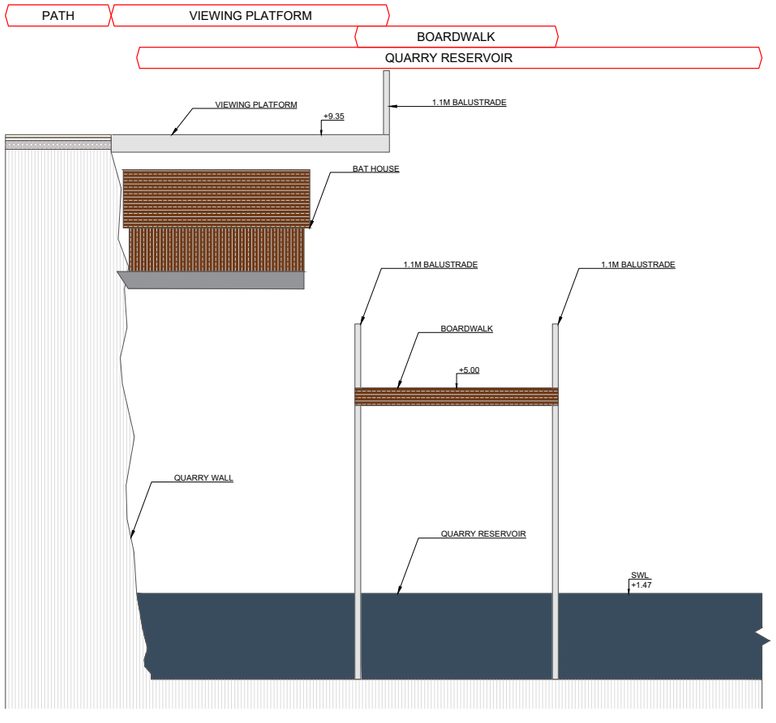
Bat Houses



3no Bat houses are proposed within the scheme. These are located above the quarry reservoir, at the north-west corner of the quarry behind the student housing, and at the north-western corner of Salesians. Refer to the landscape plan for accurate locations.
They are proposed to be suspended at least 3.5m above the ground level in all locations, either cantilevered off the quarry wall or on stilts.





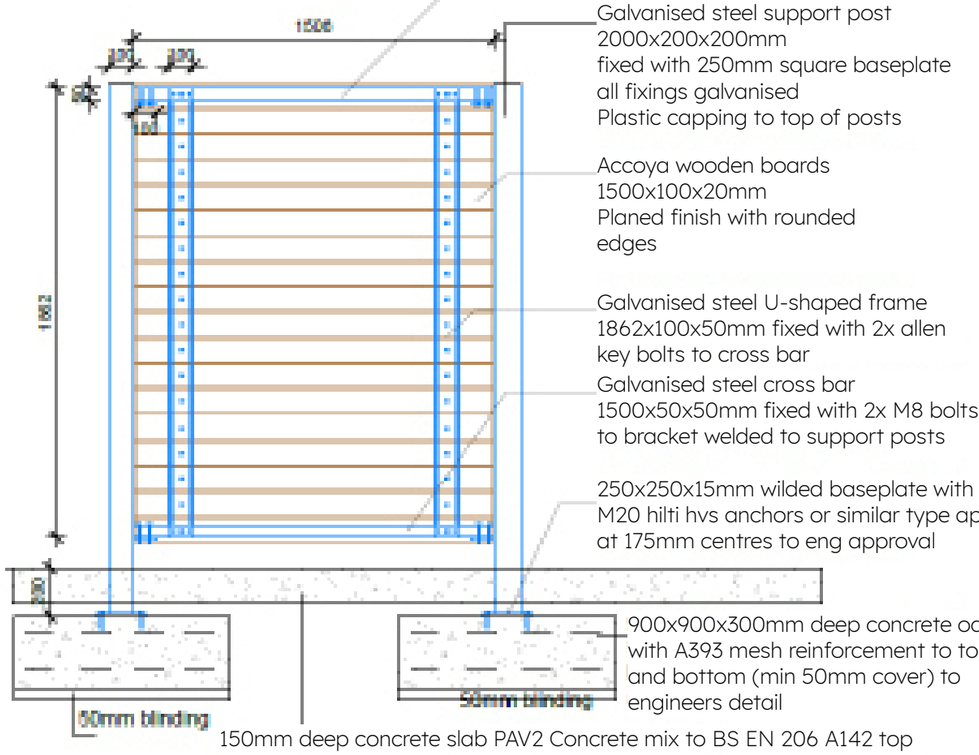


Ancillary Structures

Bin Store

The bin store at the Flaxmill entrance from North Circular Road is proposed to be an accoya timber bin store to provide a long-lasting and attractive screen to the bins. Accoya timber is a heat and chemical treated timber which makes the material much stronger while preserving the attractive timber appearance.

Bin Store as per detail below - UCD, Dublin



Galvanised steel cross bar
1500x50x50 fixed wiht 2x M8 bolts to bracket welded to support posts

Galvanised steel support post
2000x200x200mm
fixed with 250mm square baseplate
all fixings galvanised
Plastic capping to top of posts

Accoya wooden boards
1500x100x20mm
Planed finish with rounded edges

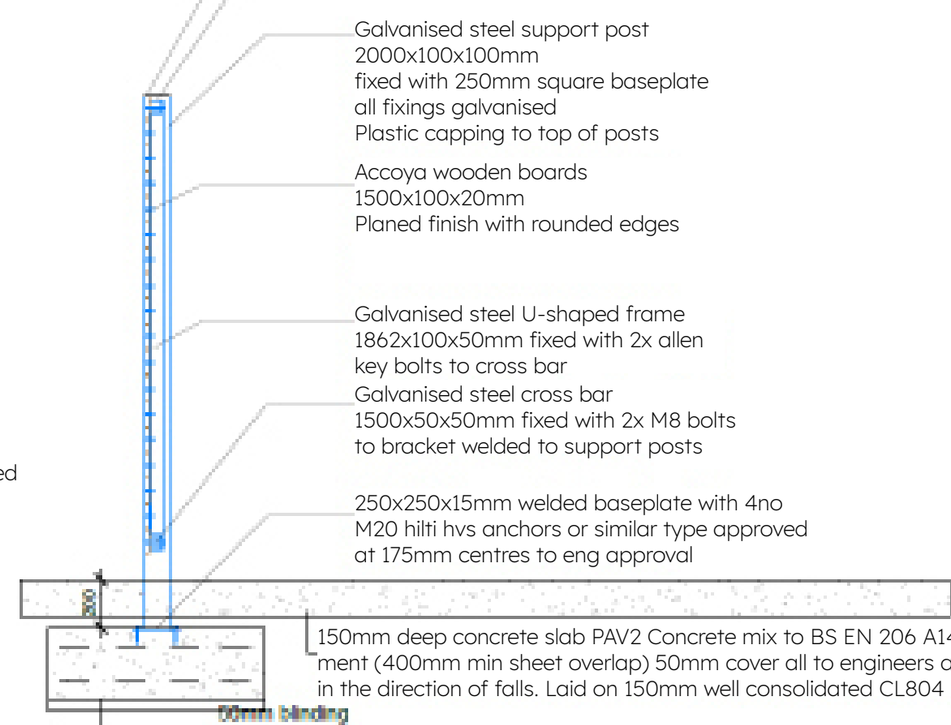
Galvanised steel U-shaped frame
1862x100x50mm fixed with 2x allen key bolts to cross bar

Galvanised steel cross bar
1500x50x50mm fixed with 2x M8 bolts to bracket welded to support posts

250x250x15mm wilded baseplate with 4no M20 hilti hvs anchors or similar type approved at 175mm centres to eng approval

900x900x300mm deep concrete oad with A393 mesh reinforcement to top and bottom (min 50mm cover) to engineers detail

150mm deep concrete slab PAV2 Concrete mix to BS EN 206 A142 top mesh reinforcement (400mm min sheet overlap) 50mm cover all to engineers approval. Brushed finish in the direction of falls. Laid on 150mm well consolidated CL804



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fixed with 250mm square baseplate
all fixings galvanised
Plastic capping to top of posts

Accoya wooden boards
1500x100x20mm
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Galvanised steel U-shaped frame
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Galvanised steel cross bar
1500x50x50mm fixed with 2x M8 bolts to bracket welded to support posts

250x250x15mm welded baseplate with 4no M20 hilti hvs anchors or similar type approved at 175mm centres to eng approval

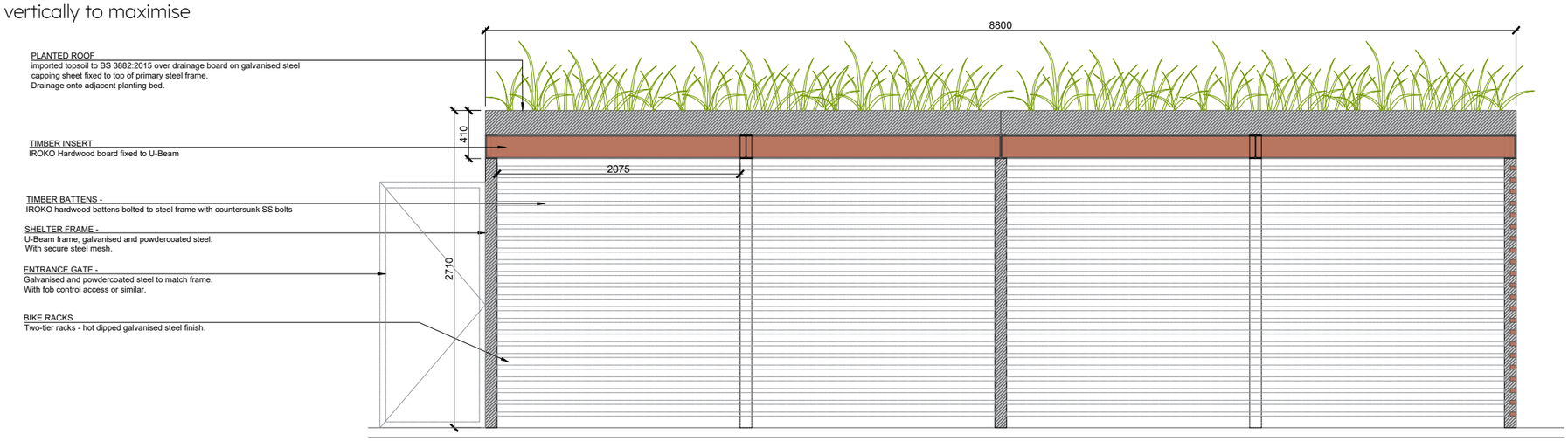
150mm deep concrete slab PAV2 Concrete mix to BS EN 206 A142 top mesh reinforcement (400mm min sheet overlap) 50mm cover all to engineers approval. Brushed finish in the direction of falls. Laid on 150mm well consolidated CL804

900x900x300mm deep concrete oad with A393 mesh reinforcement to top and bottom (min 50mm cover) to engineers detail

Ancillary Structures

Bike Store

The secure bike parking at Stonetown Terrace will serve the residents of the block of apartments, as well as those of the row of town houses. The bike store will include a secure perimeter of timber slats and wire mesh with an access gate at one of the gable ends.
A green roof is also proposed to improve local biodiversity and to soften the view of the bike store when viewed from the near-by apartments.
The storage system allows for bikes to be stacked vertically to maximise the capacity.



SECURE BIKE SHELTER ELEVATION - 1:25 @ A3 — 01 / 2007

Lockable bike shelter with green roof - © 2025 Green Roof Shelters Ltd

Stackable bike storage- © 1994 – 2025 Cyklos AB

Flaxmill Plaza

Recycled materials paving pattern

It is proposed to reused salvaged materials from the site in combination with large scale concrete paving to create a playful mosaic on Flaxmill plaza.

Reference image right: Example of combining cobbles (reclaimed) and new large scale concrete paving units.
Images bellow: Examples of materials that can be salvaged and reused from the site: Metal elements and cobble stones

Inlaying & Repaving

PAVING STRATEGY

A combination of three approaches is proposed for the paving of Flaxmill Plaza and the wilderness garden and entrance at the Chimney: inlaying, repaving and crushing the existing concrete.

Inlaying

Where the large concrete surfaces are in good condition, it is proposed to create a paving pattern through cutting the existing concrete and introducing banding of salvaged cobblestone .

Repaving

Where the large concrete surfaces are in not in good condition and in the main open area of the plaza, it is proposed to create a paving pattern through repaving with large scale concrete paving flags and introducing banding of salvaged cobblestone.

Pictures below showing large concrete paving slabs with banding.

Picture above showing example of cutting into existing (in this case tarmac) surface to introduce planting and local repaving.

Areas on site with concrete in good condition are reused and inlaid.

Crushing

PAVING STRATEGY

Crushing existing concrete

Where planting is to be introduced - such as wildflower planting at the Flaxmill facade or the wilderness garden, the existing concrete can be crushed and largely left in place with planting introduced in the cracks, or reused in the drainage layers and mulching of the planting beds.

Reference showing different sizes of stone/concrete in planted areas - creating option for stepping stones and access to the planted areas.

Reference showing the crushing of existing surface (tarmac in this case) on a former airport runway to create space for plants to grow.

Reference showing perennials and bulbs planted in gravel.

Process already naturally happening on site.

Safety surfacing

Resin bonded recycled rubber mulch safety surfacing for Older children's play, climbing and Fitness court in the Quarry

Grass surfacing and mounds to courtyards play areas

Lighting

Light fittings

Playfulness

The lighting plan aims to introduce playfulness, while keeping consistency with the overall landscape design, relating to other street furniture and colour scheme used throughout the site. Several ‘sculptural’ lighting poles of varying colours are proposed throughout the site.

Robust design

Robust lighting furniture is proposed. To maximise durability of the luminaires, lighting poles are proposed rather than bollard lighting and recessed lighting is minimised to only recessed lighting in handrails to stairs to provide maximum safety.

Safe yet environmentally friendly

Appropriate lighting an visibility across the site and streets are paramount for safety, passive surveillance, as well as perceived safety in the new development. At the same time minimising light pollution and protecting dark sky as much as possible to minimise disturbance of fauna and flora is necessary for the environment.

For this reason, uplighting is not proposed and all proposed light luminaires are to be shielded and directing light where it is necessary.
3000K soft white light is proposed to minimise impact on flora and fauna, while also creating a pleasant ambience. Dimmable luminaires are to be considered to further minimise the impact, adjusting the light colour and intensity at different times thorough the day and year, allowing warmer light in warmer months when animals and insects are the most active and adjusting light intensity throught the night.

Pole mounted lighting to complement the larger sculptural lights in form

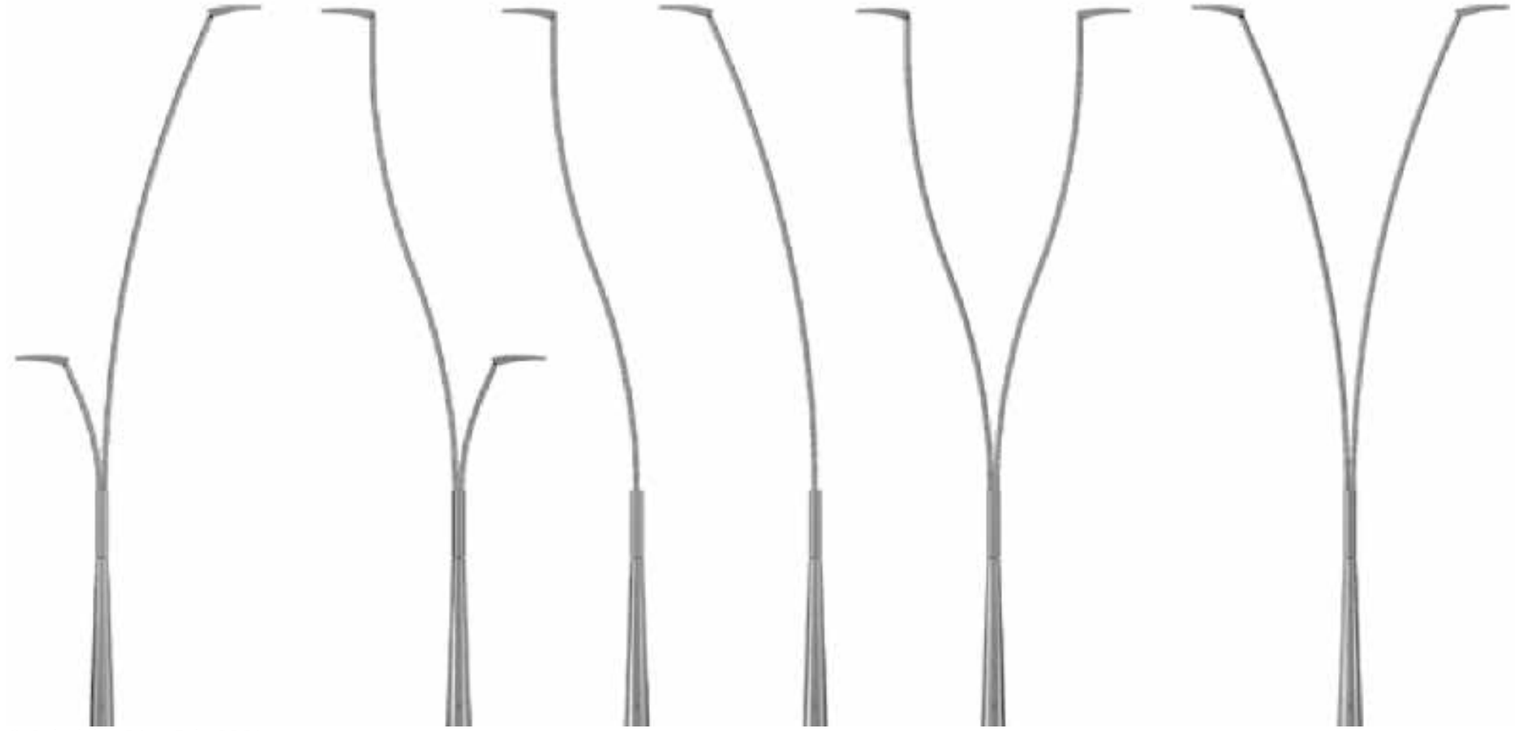
Recessed lighting to handrails to maximise safety on stairs

Lighting

Light fittings - Form

The form chosen for the sculptural lighting is inspired from nature, reminding reeds and vegetation growing up towards the sky in slightly different angles. This refers back to the theme of biodiversity as well as nature based water management which are central to the landscape design.

The form is repeated in the sculptural feature lights, as well as regular pole lights, and other street fittings, such as the railings, or bicycle stands.



9.0 Street Furniture

Seating

Seating

Playful sculptural concrete seats

Robust Timber benches

Tables and chairs (to Flaxmill Plaza and to Student Housing)

Fitness equipment

Outdoor gym equipment that can be attached to the quarry wall, such as pull up bars, ladders, leg lift and TRX

Low equipment installed in front of the wall, such sit up abs bench, lower back bench, dip bench and parallel bars

Play equipment

The playground in the central park is designed as a nature inclusive playground for all ages. Studies show that creating an interactive space with nature that triggers fantasy has a positive impact on children's play and social behaviours. Natural play enhances imaginative play as opposed to play equipment aiming largely to improve physical abilities. It also supports he development of positive relationships and allows for the environment to become a place of learning, it also has an impact on the social behaviour and structure - imagination becomes as valued as physical abilities

A diversity of play equipment is included in the playground including

- Integrating planting within the playground - meadow, trees, grasses - connection with nature
- Integrating natural structures: willow tunnel,timber stepping stones and logs
- Natural materials for play equipment - natural colour timber
- Natural loose materials: sand, wood-chip, tree leaves - encourages creative play
- Mounding - kept to a small height in order to maintain visual connectivity across the park, encourages creative play, adds visual appeal, creates diverse play options and helps to develop crucial sensory and motor skills

10.0 Planting

Trees

GENERAL TREE MIX		
Species	**Common Name**	**Code**
Acer palmatum 'Osakasuki'	Japanese Maple	**Ap**
Alnus glutinosa	Alder	**Ag**
Alnus glutinosa Laciniata	Cut-leaved alder	**Agl**
Amelanchier lamarckii	Juneberry	**Al**
Betula albosinensis 'Fascination'	Chinese red-barked birch	**Ba**
Betula nigra 'Heritage'	River Birch	**Bn**
Betula pendula	Silver Birch	**Bp**
Betula pendula 'Youngii'	Young's Weeping Birch	**By**
Betula pubescens	Weeping Birch	**B**
Betula utilis 'Jacqemontii'	Himalayan Birch	**Bu**
Carpinus betulus	Hornbeam	**Cb**
Cercidiphullum japonicum	Katsura Tree	**Cj**
Corylus avellana	Hazel	**Ca**
Gleditsia triacanthos	Honey Locust	**Gt**
Malus sylvestris	Crab Apple	**Ms**
Pinus nigra	Black Pine	**Pn**
Pinus sylvestris	Scots Pine	**Ps**
Prunus padus	Bird Cherry	**Pp**
Quercus ilex	Holm Oak	**Qi**
Quercus petraea	Sessile Oak	**Qp**
Quercus robur	Pedunculate Oak	**Qr**
Quercus robur Fastigiata 'Koster'	Fastigiate Oak	**Qf**
Robinia pseudoacacia 'Frisia'	Golden Locust	**Rp**
Salix alba	White Willow	**Sx**
Salix cinerea	Grey Willow	**Sc**
Sorbus aria	Whitebeam	**S**
Sorbus aria fastigiata	Fastigiate Whitebeam	**Sf**
Sorbus aucuparia	Rowan	**Sa**
Sorbus aucuparia "Sheerwater Seedling"	Ornamental Rowan	**Ss**
Sorbus aucuparia 'Rossica Major'	Rossica Major Rowan	**Sr**
Taxodium distichum	Swamp Cypress	**Td**
Tilia cordata 'Greenspire'	Small-leaved lime	**Tc**


Acer palmatum ‘Osakasuki’


Alnus glutinosa


Alnus glutinosa Laciniata


Amelanchier lamarckii


Betula a. ‘Fascination’


Betula nigra ‘Heritage’


Betula pendula


Betula pendula ‘Youngii’


Betula pubescens


Betula utilis ‘Jacqemontii’


Carpinus betulus


Cercidiphillum japonicum


Corylus avellana


Gleditsia triacanthos


Malus sylvestris


Pinus nigra


Pinus sylvestris


Prunus padus


Quercus ilex


Quercus petraea


Quercus robur


Quercus Fastigiata Koster


Robinia p. ‘Frisia’


Salix alba


Salix cinerea


Sorbus aria


Sorbus aria fastigiata


Sorbus aucuparia


Sorbus a. “Sheerwater Seedling”


Sorbus aucuparia ‘Rossica Major’


Taxodium distichum


Tilia cordata ‘Greenspire’

Planting Mixes

Proposed Plant Species

Flaxmill - Temporary microforest

Ilex aquifolium	Holly
Corylus avellana	Hazel
Quercus robur	Oak
Alnus glutinosa	Alder
Salix alba	Willow
Pinus sylvestris	Scots Pine
Betula pendula	Silver Birch
Crataegus monogyna	Hawthorn



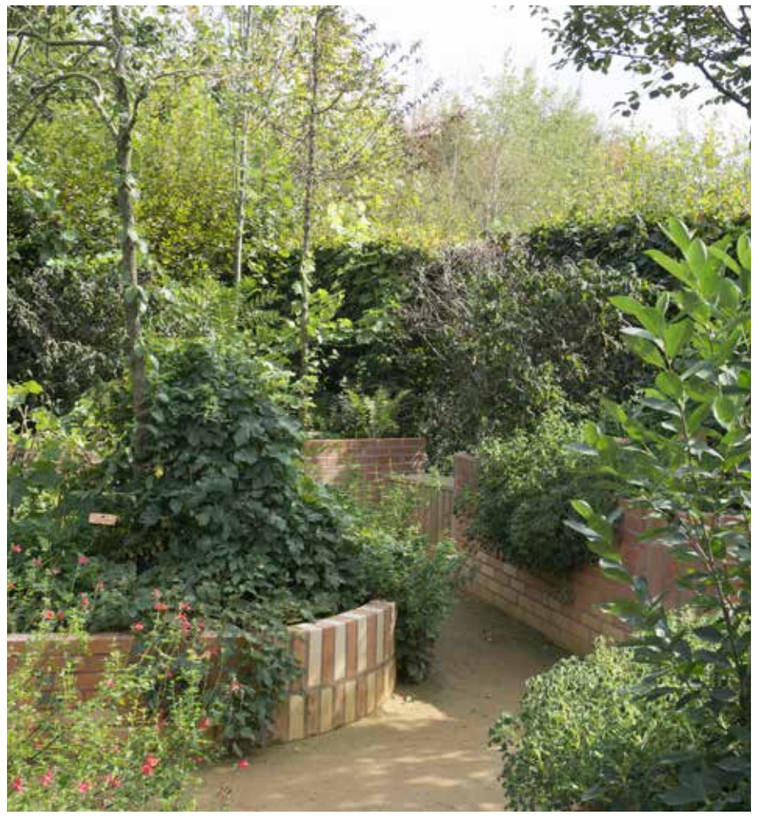





Future Forests

Chimney - Wilderness Garden

Luzula sylvatica	Great wood rush
Luzula nivea	Snowy woodrush
Polypodium vulgare	Common polypody
Polystichum setiferum	Soft shield fern
Galanthus nivalis	Snowdrop
Hyacinthoides non-scripta	Bluebell
Campanula trachelium*	Nettle-leaved bellflower
Digitalis purpurea, grandiflora*	Foxglove
Hypericum perforatum *	St John's wort
Leucanthemum vulgare*	Ox-eye daisy
Silene dioica*	Red campion
Primula veris*	Common cowslip
Primula vulgaris*	Primrose



Modern Garden Magazine

Flaxmill - Sunny Crushed Concrete Beds

Calamagrostis 'Karl Foerster'	Feather reed grass
Allium sp.*	Decorative garlics
Achillea millefolium*	Common yarrow
Achillea ptarmica*	Sneezewort
Aster cordifolius*	Blue wood aster
Campanula trachelium*	Nettle-leaved bellflower
Euphorbia polychroma*	Cushion spurge
Eupatorium canabinum*	Hemp agrimony
Gaura lindheimeri*	Gaura
Geranium 'Rozanne'*	Geranium Rozanne
Hypericum perforatum *	St John's wort
Leucanthemum vulgare*	Ox-eye daisy
Linum perenne	Perenial flax
Papaver orientale*	Oriental poppy
Salvia nemorosa*	Balcan clary
Sanguisorba 'Sangria'	Burnet
Scabiosa sp.*	Scabious
Sedum 'Autumn Joy'*	Sedum Autumn Joy
Silene vulgaris*	Bladder campion
Verbascum chaixii*	Nettle leaved mullein

Modern Garden Magazine

Floating islands

Proposed Plant Species

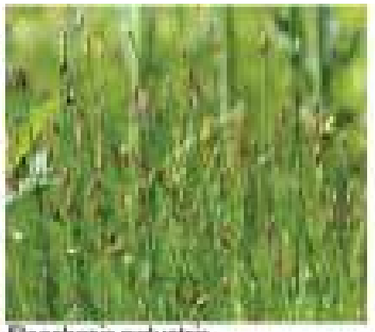
All plants proposed for Floating islands are native to Ireland. A wide variety of plants is proposed to maximise biodiversity.
A diversity of rushes and bulrushes is proposed to maximise nitrate reduction. Many of these can be invasive and need to be trimmed, the most invasive native species such as Phalaris arundinacea (reed canary grass) and Phragmites australis (common reed) are avoided as they tend to create large monocultures.
A diversity of native pollinator friendly flowering plants is added to maximise biodiversity, provide food for pollinators from spring to autumn and create an attractive look.
The final mix to be agreed with ecologist following also an inspection of the surrounding area and water testing. Other wildflowers might be added to the mix, such as Galium palustre (common marsh bedstream), Lycopus europaus (gypsywort), Hypericum elodes (marsh St' John's wort), Ranunculus flammula (lesser spearwort), or Sagittaria sagittifolia (Old World arrwohead).

Species		*Pollinator friendly*	*Evergreen*	*Flowring* *March*	*April*	*May*	*June*	*July*	*August*	*Sept.*	*Oct.*	*Height (cm)*
Sedges, bullrushes, rushes												
Carex riparia	Greater pond sedge											100 - 150
Eleocharis palustris	Common spike-rush		x									30 -70
Juncus effusus	Common rush		x									up to 100
Schoenoplectrus lacustris	Common club-rush		x									up to 300
Typha latifolia	Bullrush											150 - 250
Wildflowers												
Alisma plantago-aquatica	Water plantain	x										50 - 100
Butomus umbellatus	Flowering rush	x										100 - 150
Caltha palustris	Marsh marigold	x										10 - 50
Cardamine pratensis	Cuckoo flower	x										10 - 50
Epilobium hirsutum	Great willowherb	x										150-250
Eupatorium cannabinum	Hemp agrimony	x										100 - 150
Filipendula ulmaria	Meadowsweet	x										50 - 100
Geum rivale	Water avens	x										10 - 50
Hypericum tetrapterum	Square- stalked St. John's wort	x										50 - 100
Iris pseudacorus	Yellow iris	x										100-150
Lysimachia vulgaris	Yellow loosestrife	x										100-150
Lythrum salicaria	Purple loosestrife	x										100 - 150
Menyanthes trifoliata	Bogbean	x										10 - 50
Myosotis scorpioides	Water forget-me-not	x	x									10 - 50
Ranunculus lingua	Greater spearwort	x										60-120
Scutellaria galericulata	Skullcup	x										50 - 100
Scrophularia auriculata	Water figwort	x										50 - 100
Silene flos-cuculi	Ragged robin	x										50 - 100
Stachys palustris	Marsh woundwort	x										50 - 100
Valeriana officinalis	Common valerian	x										100 - 150
Veronica beccabunga	Brooklime	x	x									10+A3:M33A2:M33A27A1:M33

Floating islands

Proposed Plant Species


Carex riparia


Eleocharis palustris


Schoenoplectrus lacustris


Typha latifolia


Alisma plantago-aquatica

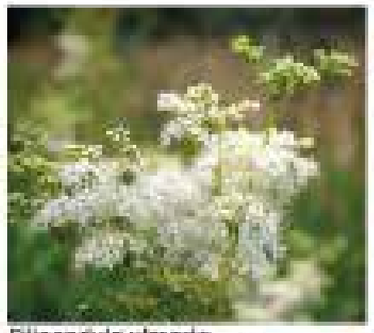

Butomus umbellatus


Caltha palustris


Cardamine pratensis


Epilobium hirsutum


Eupatorium cannabinum


Filipendula ulmaria


Geum rivale


Hypericum tetrapterum


Iris pseudacorus


Lysimachia vulgaris


Lythrum salicaria


Menyanthes trifoliata


Myosotis scorpioides


Ranunculus lingua


Scrophularia auriculata


Scutellaria galericulata


Silene flos-cuculi


Stachys palustris


Valeriana officinalis

Climbing Plants to Façades

Proposals

A number of façades have been identified throughout the site for the inclusion of climbing plants. These will aid in reducing the visual impact of buildings when viewed from key locations, while also providing valuable habitats and resources for birds, insects and pollinators.

The proposed façades on the buildings are largely brick which lends itself to allowing self-clinging climbers to attach to the wall without the installation of a trellis or other climbing systems. Plants such as Hydrangea petiolaris would be suitable for brick façades, particularly low areas in north facing locations, while Virginia creeper and Parthenocissus quiquefolia would be capable of reaching the higher parts of the buildings which are up to 6 stories tall in some locations.

In areas where self-clinging plants would not be suitable, it is proposed to implement a wire system to allow Clematis armandii to grow, particularly in lower light conditions.

Other ornamental plants can supplement the main species listed below. These include *Clematis montana Gradiflora, Lonicera periclymenum, Trachelospernum jasminoides*, and *Jasminum officinale*

Clematis armandii
Common Name: Armand's Clematis
Suitable for now light
Requires wire climbing system
Height: 8m+

Parthenocissus quiquefolia
Common Name: Virginia Creeper
Suitable for now light
Suitable for brick façades
Height: 15m+

Parthenocissus tricuspidata Veitchii
Common Name: Boston Ivy
Suitable for full shade
Suitable for brick façades
Height: 12m+

Hydrangea petiolaris
Common Name: Climbing Hydrangea
Suitable for north facing facades
Suitable for brick façades
Height: 6m+

11.0 Outline Specifications

Outline Specification

The following outline specification establishes the principles of the proposed landscape work in general and should be read in conjunction with the CEMP and mitigation measures in teh planning documentation.

Method of work

No works in relation to grading and topsoiling to be carried out in conditions where materials are wet.

Provide catchment drains or ditches to collect excess run-off and prevent water entering from adjacent land. Remove scrub as well as top growth by cutting and burning. Flail or swipe mowers can be used. Where turf is excessively thick, plough, disc harrow, and reduce vegetative content by weathering and cultivations.

Remove weeds by agreed method. Any use of chemicals shall be in accordance with the current Sustainable Use of Pesticides Directive guidelines and Plant Protection Product List which is issued and updated every year by Pesticide Control Division, Department of Agriculture, Food and The Marine.

Strip topsoil from all areas liable to disturbance of any kind, including building works, roads, underground services, all temporary access routes, compounds and storage areas. Strip the full designated working area, and any other areas liable to encroachment and traffic.

Do not run machinery over ground before stripping.

Strip the full depth of sod and topsoil. Avoid stripping into the subsoil layers.

Where a hedgerow is to be maintained, do not strip within 4 metres of it. Soil must not be stripped from any part of the area under the canopy of an tree which is to be retained.

Stockpiles

When soil is in a condition for stacking, remove all topsoil to its full depth and place it in heaps either off site in a convenient position, or on the neutral line of cut and fill. Strict precautions are essential to prevent loss or admixture with subsoil.

Soil heaps will be formed in positions which facilitate eventual respreading, reduce travel to a minimum and will not result in interference with subsequent major levelling and/or grading operations. Stockpiles shall be located on dry, free draining ground, not subject to standing water. If water ponds against the stockpile, temporary drains shall be cut to relieve it. Avoid running machinery over stockpiles.

Stockpile heaps should not exceed 1.5m in height to avoid compaction.

While topsoil is stacked, measures will be taken to ensure that weed growth is controlled by agreed methods and is carried out during the growing season to prevent weeds seeding. Any use of chemicals shall be in accordance with the current Sustainable Use of Pesticides Directive guidelines and Plant Protection Product List which is issued and updated every year by Pesticide Control Division, Department of Agriculture, Food and The Marine.

Topsoil stockpiles shall not be covered by subsoil, rock, rubble, site debris, fuel or chemical pollution. Where there is a danger of contamination or topsoil and subsoil stockpiles intermingling the topsoil stockpile shall be fenced off.

Temporary yards, storage areas or hardstanding areas shall not drain towards topsoil stockpiles.

Topsoil is the property of the Employer, and shall not be removed from site without consent given from Employer or Landscape Architect.

Subsoil cultivations

Subsoil will be placed in layers not exceeding 150mm thick; consolidation of fill will be accomplished by the use of special compacting machinery or by running over it with the next load; filling by tipping over an exposed face is not recommended because of the difficulty of consolidation.

After completion of subsoil moving, the formation level will be graded with the box scraper to even, running contours and then, depending on the soil texture and degree of compaction, loosened with a subsoiler or ripper.

Subsoil levels

Subsoil levels shall be 200mm below the finished ground levels in all areas for grass seeding to allow for 250mm of topsoil to be placed so that 50mm of topsoil stands proud of all kerbs, paths, etc.

Subsoil levels shall be 400mm below the finished ground levels in all areas for shrub planting to allow for 450mm of topsoil to be placed so that 50mm of topsoil stands proud of all kerbs, paths, etc.

Subsoil levels shall be 550mm below the finished ground levels in all areas for shrub planting to allow for 600mm of topsoil to be placed so that 50mm of topsoil stands proud of all kerbs, paths, etc.

Subsoil levels in all areas for tree planting shall be 600-900mm below the finished ground levels to allow for 900mm of topsoil to be placed.

Topsoil

Topsoil shall be native topsoil as removed and stored.

All imported topsoil to be of medium texture, pH matching that of the native topsoil, stone content 10mm in size not greater than 5% by weight, and no stones greater than 40mm in any dimension, and shall conform to BS 3882:1965. Topsoil shall be a free draining sandy loam. Depth of topsoil to be as specified.

Topsoil shall be free of perennial weed roots, i.e. couch grass, sticks, sub soil or any waste, toxic, putrescent or foreign matter.

After spreading, the soil should be cultivated to crumb size to a condition suitable for blade grading. Large stones and unwanted material 75mm and over will be picked off and carted away or recycled on site. Areas should then be blade graded to true flowing contours.

As topsoiling proceeds all consolidated wheel tracks shall be forked over.

Final grading of the top 150mm is to be carried out to ensure a true specified level and slope to avoid dishing or other depressions where water may collect. The use of a heavy roller to roll out humps will not be permitted and any area that becomes unduly compacted during the grading operation shall be loosened by forking or harrowing.

Topsoil levels

All topsoil shall be placed and graded by the Main Contractor to the following levels:

grass seeding	200mm
shrub / groundcover planting	450mm
hedge planting	600mm
tree planting	min 600mm

Maintenance of topsoil stockpiles

Stockpiles of 1 year duration or less: keep weed free with agreed methods. Any use of chemicals shall be in accordance with the current Sustainable Use of Pesticides Directive guidelines and Plant Protection Product List which is issued and updated every year by Pesticide Control Division, Department of Agriculture, Food and The Marine.

Stockpiles of up to 2 year's duration: roughly grade top and slopes of topsoil. Sow Italian Ryegrass at 50kg per hectare as a temporary grass cover. Control noxious weeds.

Tree Planting

Planting pits for trees in undisturbed ground will be backfilled with excavated material.

Tree pits in mounds or other made up ground shall be backfilled with topsoil.

All tree pits for all trees other than semimature trees shall be excavated 200mm wider in all directions than the natural root spread, or rootball, and the base forked to improve drainage. Stakes shall be positioned before backfilling.

Topsoil backfill shall be mixed with peat substitute in the ratio of 4:1.

60g approved slow release fertiliser shall be incorporated.

The backfill shall be settled and well firmed around the roots avoiding air pockets.

All semimature tree pits shall be excavated 500mm wider than the natural root rootball, and 150mm deeper to allow for 250mm of backfill mix, tamped firm to 150mm. In all semimature tree pits an additional depth of 150mm should be dug to allow for a 150mm gravel layer at the bottom of the pit to aid in drainage.

Sides of tree pit shall be ripped and loosened to ensure a good bond with the backfill and to avoid root girdling.

All semimature tree pits shall be backfilled with mix consisting of: 10 parts native topsoil and 5 parts sharp sand. 60g Enmag or similar approved slow release fertiliser shall be incorporated.

A 2m clear stem shall be maintained on trees generally. A 3.5m clear stem shall be maintained where a tree is directly adjacent to a fire tender access route.

Plants Generally

All plants shall conform fully to the specification in respect of species, size and quality. Substitutions will not be permitted. If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of nearest equivalent size or variety, with an equitable adjustment of contract price.

All plants shall be well grown, sturdy and bushy, according to type, and free from all disease and defects.

The Landscape Architect reserves the right to reject any plant material before or after planting if it does not conform with the specification.

All plants shall be adequately hardened off prior to planting, where frost or cold winds may be a problem. All plants shall be supplied with temporary labels with the full botanical name , on each bundle or batch of plants.

The Landscape Contractor should indicate in their tender source of material to be used and where it can be inspected prior to award of contract.

All plants that do not conform to the specification will be automatically rejected and must be removed from site and replaced at the Landscape contractor's expense.

All trees, shrubs and other plant material shall comply with the minimum requirement of the relevant EU or equivalent British Standards below:

BS 3936 Part 1: Specification for trees and shrubs

BS 3936 Part 4: Specification for forest trees

BS 3936 Part 5: Specification for Poplars and Willows

BS 3936 Part 6: Specification for herbaceous, perennials and alpines

BS 3936 Part 9: Specification for bulbs, corms and tubers

BS 3936 Part 10: Specification for groundcover plants

Outline Specification

Time of Lifting
Bare root plants must only be lifted when the ground is moist and the plant is dormant between November and end March of the current year. Lifting must never take place when there is a severe ground frost. Particular attention must always be paid to the protection of the roots on lifting when there is a strong drying wind or sun.

Protection
All semimature tree pits shall be excavated 500mm wider than the natural root rootball, and 150mm deeper to allow for 250mm of backfill mix, tamped firm to 150mm. In all semimature tree pits an additional depth of 150mm should be dug to allow for a 150mm gravel layer at the bottom of the pit to aid in drainage.
Sides of tree pit shall be ripped and loosened to ensure a good bond with the backfill and to avoid root girdling.
All semimature tree pits shall be backfilled with mix consisting of: 10 parts native topsoil and 5 parts sharp sand. 60g approved slow release fertiliser shall be incorporated.
Care must be taken to ensure that bare roots are protected from physical damage and desiccation at all times. All bare roots must be covered within two hours of lifting.

Bundling
Whip planting must be in bundles of the same species and size, all shoots must face in the same direction so that roots and shoots are not in contact, and must be of equal numbers. Bundles are to be securely tied with supple material which will not, by its nature or tension, cause damage to the plants.

Labelling
Each individual plant, bundle, bag, or lot of one species shall be labelled with a securely attached label, clearly indicating the plant name, grade and quantity.

Grass Seed
Grass seed shall conform to the requirements of British Standard 4428:1969 and subsequent amendments, and to the European communities (seed and fodder plants) regulations 1976.
The Landscape Contractor shall supply, with each seed mixture, a certificate stating the composition, purity, germination, year of collection and country of origin.
The germination capacity of each constituent of the mixture should be not less than 80%, and the purity of the mixture not less than 90%.
Total weed seed content should not be more than 0.5% and the total content of other crop seeds should not be more than 1%. These minimum figures shall be for the current 14 month period of annual tests.
The seed is to be thoroughly re-mixed before sowing to avoid patchiness on the ground and sown at a rate of 35 - 50g per square metre.

Container-grown Shrubs, Groundcovers, Climbers & Herbaceous Plants
Shrubs shall be bushy, well established nursery stock with a good fibrous root system. They shall be container grown, true to size, name and description as scheduled. Shrubs shall conform to the appropriate British Standards.
Plants shall not be pot bound, nor with roots deformed or restricted.
Bare root material will only be accepted where specified.
Herbaceous plants shall be supplied as well rooted clumps, showing several healthy buds, and grown in pots. Pots shall be appropriate to the size of the plant supplied, minimum size 0.5litres (80mm square or 90mm diameter).

Whips and Transplants
All plant material must comply in all respects with the current edition of BS 3936 Parts 1, 4, and 5.
Transplants shall not be less than 3 years old and have been transplanted at least once. Trees shall be sturdy, with a balanced root and shoot development, sizes shall conform to schedule.
Willows shall have been stumped and transplanted at the end of the first year in the nursery.

Trees
Trees shall conform to the appropriate British Standards.
All trees should be full and well shaped, bark unmarked and have healthy root systems.
The Landscape Architect must inspect and approve all trees prior to lifting or planting.
Trees must all be of identical size and shape and should originate from the same stock nursery and stand.
Rootballed trees shall be rootballed immediately when lifted at the nursery.
The rootball shall be suitable for the size of crown and the rootball shall be flat bottomed.
The rootball shall be formed through regular transplanting; every 2-3 years minimum.
The rootball shall be wrapped in hessian and steel wire netting or other suitable and approved decomposable material.
Standard pleached trees shall have a clear stem 1.7m to 1.85m in height from ground level to the lowest branch, a minimum girth of 8cm at 1m from ground level and a total height of 2.75m to 3m.
They shall have a well defined, straight and upright central leader, with branches growing out of the stem with reasonable symmetry. The crown shall be well shaped, balanced, of a form and habit natural for the species.
All advanced nursery trees shall comply with BS 5236: 1975. They shall have a well defined, straight and upright central leader, with branches growing out of the stem with reasonable symmetry. The crown shall be well shaped, balanced, of a form and habit natural for the species. Trees shall have a sturdy, reasonably straight stem not less than 1.8m from ground level to the lowest branch.
All advanced nursery stock trees shall be supplied with roots balled.
All coniferous trees shall be supplied rootballed or container grown, with a good fibrous root system. Trees shall conform to specified height with well developed, uniform branching systems.

Shrub/Groundcover Sizes
All shrubs and groundcovers shall be supplied as sizes indicated in the schedules and drawings.

Tree Sizes

Type	Girth	Height
Whip planting	-	600-1200mm
Half Standard Tree	4-6cm	1.8-2.1m
Light Standard Tree	6-8 cm	2.25-2.5m
Standard Tree	8-10 cm	2.75-3m
Selected Standard Tree	10-12 cm	3-3.5m
Heavy Standard Tree	12-14 cm	3.5-4m
Extra Heavy Standard Tree	14-16 cm	4-4.5m
Advanced Extra Heavy Standard Tree	16-18 cm	5m
Semimature Tree	20-22 cm +	6.5-7m +

Tree Anchors, Stakes, Guys, etc.
All trees other than semimature trees and whips trees shall be supplied and fitted with one tree stake per tree. Tree stakes shall be peeled poles of oak, sweet chestnut, pine or douglas fir, or tanalised larch. They shall be at least 1.8 metres long unless otherwise specified, with a minimum diameter of 75 mm at both butts. Stakes shall be driven prior to planting with a drive all, wooden maul or cast iron mell, not with a sledge hammer.
Trees shall be tied to each stake with a purpose made tie and spacer, the tie to be overlapped and thrice nailed to the stake. Tree ties shall be rubber or PVC or proprietary fabric laminate composition, and shall be durable enough to hold the tree secure in all weather conditions for a period of three years.
They shall be flexible enough to allow for proper tightening of the tie.
Tree ties shall be 25mm -40mm wide depending on tree size. They shall be fitted with a simple collar spacer to prevent charring, and with a buckle for adjustment.
All Semimature trees shall be supplied and fitted with anchoring system.

Mulch
Mulch shall be graded bark chippings from coniferous trees, particles 25 - 75mm, free of fine material, dust or wood. Mulch will be rejected if in the Landscape Architect's opinion it is likely to be wind blown.

Approved chemicals
Any use of chemicals shall be in accordance with the current Sustainable Use of Pesticides Directive.
All weed killer and fertiliser shall be applied with properly designed equipment, maintained in good order and calibrated to deliver the specified volume, evenly and without localised overdosing. All quantities shall be accurately measured.

12.0 Risks and Next Steps

Risks and Next Steps

The following components to the scheme will require further coordination, updating and review closer to detailed design stage. The public realm works is engaged across the current scheme (Residential and Public Realm). This means that the residential sites are not solely stand alone projects in isolation of the public realm.

Phasing of public realm and individual residential sites will require coordination relating to access, amenity, water stewardship and biodiversity

The amenities provided in the public realm contribute to the residential schemes. The delineation of the residential sites and their delivery is interrelated to the delivery of the public realm. It also implies that the detailing of the public realm should be seamless, whilst respecting character areas.

The provision of the older children's play space fulfils the requirement of the apartment guidelines, whilst smaller children's play is located in residential communal space.

The functions of the reservoir are threefold; recreational amenity, water stewardship and biodiversity. The reservoir functions for both water attenuation and water quality, and collects surface water from Salesians and Stonetown schemes, as well as the public realm. The Flaxmill Square (and ultimately the buildings not in this scheme) and the O'Callaghan Strand scheme have localized Nature Based SuDS designed in to them. The overall strategy for water stewardship is interrelated across the sites within the current scheme.

Repurposing materials in external spaces will require further review as to suitability of materials in relation to proposed functions – relating to strength, safety, compliance, costs and aesthetics. Salvaging, cleaning and storage will need to be coordinated, with some elements managed on site where possible. This includes existing construction materials on site, stored materials and potential rock excavations.

Balancing the sequence of site investigations and ecology and structural surveys and protection/enhancement of biodiversity will need careful phasing. In particular, works relating to the reservoir, and the quarry walls and boundaries will require coordinated methodologies across disciplines. This will include the timing of placing bat houses on the site.

Enabling works and construction compounds will require coordinated approaches across disciplines to minimise impact on cultural and natural heritage, including rock removal .

Sequencing of servicing and emergency uses will require temporary or finished areas in the public realm to facilitate the residential developments as they come on stream.

Further exploration of tree planting strategy and project phasing will help define the practicalities of temporary tree planting in meanwhile use areas and whether it can be transplanted to the residential and public ream areas at a later date, or some alternative use.

The strategy for the management of the site(s) will help determine whether any equipment is retained on site. This relates to external maintenance and cleaning equipment, and storage of equipment that facilitates amenity use (potentially related to water sports and rock climbing).

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