Residential Development at Former Teagasc Lands, Kinsealy, County Dublin

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GREEN INFRASTRUCTURE PLAN

January 2025



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1. SITE CONTEXT

Site Location





Gross Site Area c.8.2 ha

Existing School Site

The proposed development consists of the demolition of existing buildings and structures on a site associated with the former Teagasc Research Centre, and the construction of 193 no. residential dwellings comprising 153 no. two storey houses (consisting of 30 no. two-bed; and 123 no. three-bed terraced houses) and 40 no. duplex units (comprising 20 no. two-bed ground floor apartments with 20 no. three-bed duplexes above) arranged in three storey blocks.

The proposed development includes a single storey childcare facility (approx. 283 sqm gross floor area) with the capacity for approximately 50 children.





Site Context

Wider Context

Malahide/Portmarnock Educate Together NS



Saint Nicholas of Myra National School





Subject Lands

Schools

Recreation & Sports Facilities

2. GI OVERVIEW

Design Principles

The use of nature-based solutions, alongside traditional drainage, in our roads and streets is particularly important with the multiple benefits that it provides, such as:

• Improving water quality in our receiving water bodies thus benefiting human, marine and aquatic health,

- Protecting groundwater recharge,
- Improved road safety through landscape interventions,
- Creating a high-quality public realm,
- Reduced flood risk, water channel erosion and overflows in our drainage and sewer systems,
- Creating more sustainable and climate adaptive urban neighbourhoods,



- Increased biodiversity,
- Provision of shade and reducing the "heat island" effect,
- Reduction of noise pollution,
- Improved air quality,
- Enhanced visual amenity
- Lessening the negative impacts of urban development on the natural environment,
- Potential for lowering capital and operating costs associated with development.

-Advice Note 5 Road and Street Drainage using Nature Based Solutions - Design Manual for Urban Roads and Streets







Proposed Primary GI Conectivity Route



Proposed Primary GI Conectivity Route

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GI Overview

Main Themes

Biodiversity

As seen in the Arborist plan of the site, the majority of existing trees, woodland and hedgerows are due for removal to accommodate the proposed development. It is recommended to augment this existing vegetation with new dense woodland, native trees, native hedges and wildflower mix, bolstering the ecological grounding and biodiversity of the site.

Additional woodland areas are proposed to connect to existing vegetation in a wider context. . The woodland habitat is additional to the existing landscape which consists native hedgerows and trees. In grassed areas, wild flower/meadow mixes are being introduced to increase the range and species present on site. Therefore, appropriate additional habitats are being introduced to the site area which will both preserve and contribute to the existing ecological networks and overall biodiversity value of the subject site.

A proposed pond in the form of a standing water reservoir, spanning approximately 250 square meters, is designed to support local bat and bird wildlife in the area. It is propsed as a mitigation measure required by the bat surveyor.

Open Space

Public open spaces have been provided across the site. These areas are thoughtfully designed to create an enjoyable communal experience, with clear Landscape Architecture principles guiding our design approach, and ecological principles guiding our planting approach.

Sustainable Water Management

Please see the Engineers drawings for their SUDS interventions, natural SUDS measures have been introduced where appropriate as part of the proposed development.

It is proposed to introduce permeable paving in private parking spaces serving the development. The goal of permeable paving is to control stormwater at the source to reduce runoff. In addition to reducing surface runoff, permeable paving has the dual benefit of improving water quality by trapping suspended solids and filtering pollutants in the substrata layers.

Swales are grassed channels proposed to run along the west of the site. The roads, footpaths and cycle lanes in these areas will be linked to the swales, and rainfall from these surfaces may then be percolated to the soil. Grassed swales also enhance surface water runoff quality as the blades of grass slow down water flow, allowing suspended particles to filter and settle out of suspension. The swales will be connected to the surface water network so that any excess flows can be directed to the mains rather than overspilling to open spaces on the site.

Landscape

The proposed development has been designed to be integrated sensitively into a high quality landscaped environment consisting of grasslands and woodlands. The overall character of the landscape shall be naturalised with a range of habitats, hedgerow, woodland and grassland. This will add to the green infrastructure of the local area and shall feed into the existing hedgerows and trees surrounding the proposal.





Green Infrastructure Plan

The landscape design will provide for the following;

1. Support an increase in species and new habitats in and around the new Development.

2. Provide a wide variety of Park areas with a range of habitats and amenity spaces to meet the needs of nature and residents.

3. Be equipped to cope with the effects of climate change and weather events, this includes the integration of Suds into the landscape design, swales and tree pits.

4. The landscape design has been developed to fit into the landscape setting and the surrounding context.

The proposed landscape design seeks to use native landscape materials in a high development low impact way, i.e. the use of natural materials, planting (native pollinator) to achieve a sustainable landscape that will increase the range of species and or improve the existing landscape habitat on site. The sustainable nature of the design requires it to be used by both nature and people, based on the following principles;

 Connectivity – A well-connected green space network that can serve both humans – amenity and nature – biodiversity. Theses shall link to the external landscape wherever possible.
Multifunctionality, Provision of a number of ecosystems within the development, combined between human and natural needs.

3. Integration – Interactions and links between grey and green infrastructure, Suds interventions. Liaise with the consulting Engineers on drainage.

4. Diversity – Enhancing the different structures that are in place – managed/artificial or natural and combine them as a sustainable landscape design. (Large or small).

5. Applicability – Considers if the proposals are realistic, that were developed by the design team . I.e. if the solutions to sustainable issues are adaptable to the site or not.







3. GI POLICIES

Response to Green Infrastructure Objectives in Fingal Development Plan 2023 - 2029

Policy GINHP1 - Resilient Design

Promote an awareness of the benefits of Resilient Design and the multi-functional nature of Green Infrastructure. Apply principles of Green Infrastructure to inform the development management process in terms of design and layout of new residential areas, business/industrial development and other significant projects while maximizing the multi-functional nature of Green Infrastructure by ensuring the development of synergies between Public Open Space, Biodiversity, SuDS/Water Sensitive Design and Active Travel objectives.

Response

Our design integrates Green Infrastructure as a fundamental framework, shaping the layout and functionality of the development:

Public Open Space:

Large, multi-functional open spaces have been incorporated to serve as hubs for recreation, social interaction, and ecological conservation. Features include playgrounds, sports facilities, and quiet areas for relaxation, all interwoven with natural landscapes.

Biodiversity:

Native vegetation and pollinator-friendly planting schemes have been utilized throughout the site. Wildlife corridors, bird nesting areas, and aquatic habitats are integrated to support local ecosystems.

Policy GINHP1

Sustainable Drainage Systems (SuDS) / Water-Sensitive Design:

The design incorporates bioswales, permeable pavements, and retention basins that manage stormwater while enhancing the aesthetic and ecological value of the site. These features are designed to mitigate flooding, improve water quality, and create opportunities for biodiversity.

Active Travel Objectives:

The development prioritizes pedestrian and cycling routes that connect residential, and recreational areas. Treelined paths and shaded rest areas encourage active travel, while strategically located bike racks and access to public transport hubs further reduce reliance on cars.

Adaptable Design:

The project is designed to evolve with changing climate conditions, ensuring long-term functionality. Green roofs are incorporated into building designs, contributing to energy efficiency and urban cooling.



Proposed Tree Canopy



Proposed SuDS

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GI Policies

Policy GINHP10

Response to Green Infrastructure Objectives in Fingal Development Plan 2023 - 2029

Policy GINHP10 -Green Infrastructure and Development :

Seek a net gain in Green Infrastructure through the protection and enhancement of existing assets, through the provision of new Green Infrastructure as an integral part of the planning process, and by taking forward priority projects including those indicated on the Development Plan Green Infrastructure maps during the lifetime of the Development Plan.

Response

Our design fully aligns with Policy GINHP10 by seeking a net gain in Green Infrastructure through the following measures:

Protection and Enhancement of Existing Assets: Preservation of Natural Features: Existing trees and hedgerows are integrated into the design where possible, ensuring their protection and enhancement. Buffer zones have been created around these features to safeguard their ecological value.

Enhancement of Ecosystem Services:

We have improved existing habitats with native planting, and biodiversity-focused management practices, supporting pollinators, birds, and small mammals.

Creation of New Spaces:

The design includes new greenway corridors, public parks, and urban woodlands that enhance connectivity and accessibility. These spaces are designed to serve both ecological and recreational purposes. The development area's key feature is the green route that runs on an east west axis through the site. The route shall contain a cycle route and a natural setting, setting the tone for a theme applied throughout the development.

The green route will act as a green buffer between residential units and frame the active open spaces that along the centre of the site.

Integration with the Planning Process:

Green Infrastructure has been a guiding principle from the concept stage, ensuring seamless integration into the broader development layout.

Alignment with Development Plan Green Infrastructure Maps:

Our proposal directly addresses priority projects outlined in the Development Plan. Specific features, such as linear parks and wildlife corridors, have been positioned to align with identified green infrastructure opportunities.

Collaborative Approach:

Partnerships with local authorities and stakeholders ensure our design supports long-term objectives, contributing to the Green Infrastructure network at a regional scale.



East-west Greenway & North-south park areas





Green Infrastructure

Policy GINGP6

Response to Green Infrastructure Objectives in Fingal Development Plan 2023 - 2029

Policy GINHP6 – Multi-Functionality

Ensure delivery of multifunctional green and civic spaces that meet community needs, promote active and passive recreation, flood and surface water management and local habitat improvements. The multi-functionality of spaces will be balanced against the need to protect and enhance local habitat and the recreational and functional requirements of parks

Response

Our design approach exemplifies the principles of Policy GINHP6 by ensuring the delivery of multifunctional green and civic spaces that address community, ecological, and functional needs.

Meeting Community Needs

Recreation Opportunities:

The design includes diverse recreational facilities such as playgrounds, sports areas, and woodland walks to cater to all age groups and activity levels.

Social Integration:

Open spaces are designed to foster community interaction, featuring flexible event spaces and gathering areas.

Promoting Active and Passive Recreation Active Recreation:

Dedicated pathways for walking, cycling, and jogging connect residential, business, and leisure areas, encouraging active lifestyles.

Passive Recreation:

Quiet zones with seating and shaded areas provide opportunities for relaxation and connection with nature.

Flood and Surface Water Management Sustainable Drainage Systems (SuDS): Bioswales and retention basins are integrated into the design, effectively managing surface water while enhancing aesthetics.

Flood Mitigation: The use of permeable pavements and strategically placed vegetation reduces runoff and supports groundwater recharge.

Local Habitat Improvements

Biodiversity Enhancement: The design incorporates pollinator-friendly plants, wildlife corridors, and water features to support diverse habitats.

Habitat Protection: Sensitive ecological areas are protected with minimal intervention zones, ensuring balance between recreational use and ecological preservation.

Balancing Multi-Functionality

The design carefully balances recreational, ecological, and functional requirements. For example, a retention pond serves as a flood management feature while doubling as a habitat for aquatic species and a visual amenity for park users.

Parks and green spaces are zoned to manage foot traffic and protect sensitive habitats without compromising usability.







GB Zoned POS 0.85ha

Greenbelt Lands Zoned 2.25ha





Play Spaces





GI Policies

Fingal Development Plan 2023-2029

Objectives of the Fingal Development Plan 2023-2029 relating to Hollystown Residential Development:

Objective DMSO129 – Use of Native Species in New Developments Require the use of native species where appropriate in new developments in consultation with the Council. **Objective DMSO131 – Tree Selection** Consider in tree selection the available rooting area and proximity to dwellings or business premises particularly regarding shading of buildings and gardens. **Objective DMSO132 – Planting of Large Canopy Trees –** Promote the planting of large canopy trees on public open space and where necessary provide for constructed tree pits as part of the landscape specification. **Objective DMSO133 – Street tree Planting Plans -**Street tree planting plans shall accompany developments over 50 units. Constructed tree pits will be required where trees are planted in hard surfaces and grass verges less than 1.2m wide. These plans will include the location of each constructed tree pit of a minimum rooting volume of 16 cubic metres, lamp standards and underground services. The location of tree planting in proximity to built features including footpaths must refer to BS5837:2012 Trees in relation to design, demolition and construction – Recommendations The width of grass verges where tree planting is proposed must be labelled on landscape plans. **Objective DMSO134 – Planting along Distributor Roads** Ensure new Distributor Roads or similar provide for grass verges of a minimum width of 2.4 metres to allow for avenue tree planting and where necessary provide for constructed tree pits as part of the landscape specification. Road verges shall be a minimum of 1.2 metres wide at locations where small canopy trees are proposed. **Objective DMSO135 – Location of new Trees** Where new trees are being planted, these will be located so they do not cause future interference to streetlights, typically trees shall be located so there is a distance of no less than 7m from the centre of the main stem to the lighting pole. **Objective DMSO139 – Replacement of Removed Trees** Ensure trees removed from residential areas are replaced, where appropriate, within the first planting season following substantial completion of construction works.

Response

DMS0129 - We have incorporated native trees into our planting scheme

DMS0131 - We have incorporated root barriers / protection into our scheme

DMS0132 - We have incorporated large canopy trees into our planting scheme

DMS0133 - We have a strong street tree design in our planting scheme. Constructed and utilised between car spaces

DMS0134 - Ample street trees have been provided on all road types with grass verges that provide sufficient space for a tree to fully establish.

DMS0135 - We have a considered street lighting through the design and have kept trees away from lighting. - approx 7m from light stand

DMS0139 - We have incorporated our design to replace removed trees and enhance the space with lots more proposed than existing







4. GI DESIGN

Proposed Trees



Betula jacquemontii multi stem



Malus domestica



Pinus sylvestris



Proposed Trees Planting Location



Amelanchier lamerkii



Prunus domestica



Sorbus aucuparia



Quercus robur



Prunus avium

Fagus sylvatica

Proposed Shrub Planting





Bergenia cordifolia







Persicaria affine

Libertia grandiflora



Aucuba japonica



Prunus 'Otto luyken'



Lavandula angustifolia



Hypericum hidcote



Astellia 'Silver Spear'



Proposed Shrub Planting Location



Agapanthus 'Blue Giant'



Kniphofia 'Royal standard'



Nerine bowdenii



Sedum spectabile



Miscanthus sinensis











Proposed Hedgerow



Proposed Native hedgerow



Prunus Iusitanica



Proposed Hedgerow to define boundaries and create a village like look to the place.









GI Design

SuDS - Rain Garden



Raingardens are designed to collect and manage reasonably clean water from roofs and low pollution risk drives and pathways. They are generally installed where community or private maintenance is available to upkeep these attractive features.

Key aspects of raingarden design include:

- 1. gentle side slopes with water collected at the surface
- 2. a free-draining soil, sometimes with an underdrain to avoid permanent wetness
- 3. a minimum of 450mm improved topsoil with up to 20% coarse compost
- 4. garden plants that can tolerate occasional submersion and wet soil this includes
- most garden plants other than those particularly adapted to dry conditions
- 5. an overflow in case of heavy rain or impeded drainage.



Rain Garden Locations





GI Design

Proposed Miyawaki Forest Planting



The Miyawaki Mini Forest Method







Miyawaki mini-forest locations

The Miyawaki Method is a reforestation technique that involves planting a diverse mixture of native tree species in a small area, closely packed together to mimic the natural density and biodiversity of a forest. The method aims to accelerate the growth of a dense, native forest in a short period, typically within 20 to 30 years, compared to the decades or centuries required for traditional reforestation techniques. This technique is known for its ability to restore degraded land, improve soil quality, increase biodiversity, and mitigate climate change by sequestering carbon dioxide. It has gained popularity worldwide as an efficient and sustainable approach to ecological restoration and urban greening.





GI Design

SuDS - Swales

Swales are shallow, flat bottomed vegetated channels which can collect, treat, convey and store runoff.

1. The basic profile is a 1 in 3 or 1 in 4 side slopes to a flat base falling at no more than 1 in 50 to prevent erosion. Check dams or terraced swales can be used to mitigate risk of erosion where 1 in 50 falls cannot be achieved.

2. Base width less than 1m wide will increase the risk of erosion and ditch forming, conversely, base width wider than 3m a meandering channel can develop.

3. 150mm clean topsoil over subsoil. Ripping or light harrowing will improve establishment of the swale by providing a key for the topsoil, encourage deep rooting and assist infiltration.

4. Where swale vegetation is kept less than 100mm, the shoulders at the top of the swale can be 'scalped' leaving bare soil. The shoulders should therefore be rounded to prevent this happening.

- 5. Swale can be vegetated with more biodiverse plants to attract pollinators etc.
- 6. Swale can be under-drained using a filter drain to create a dry swale.

















MULTIDISCIPLINARY DESIGN TEAM



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