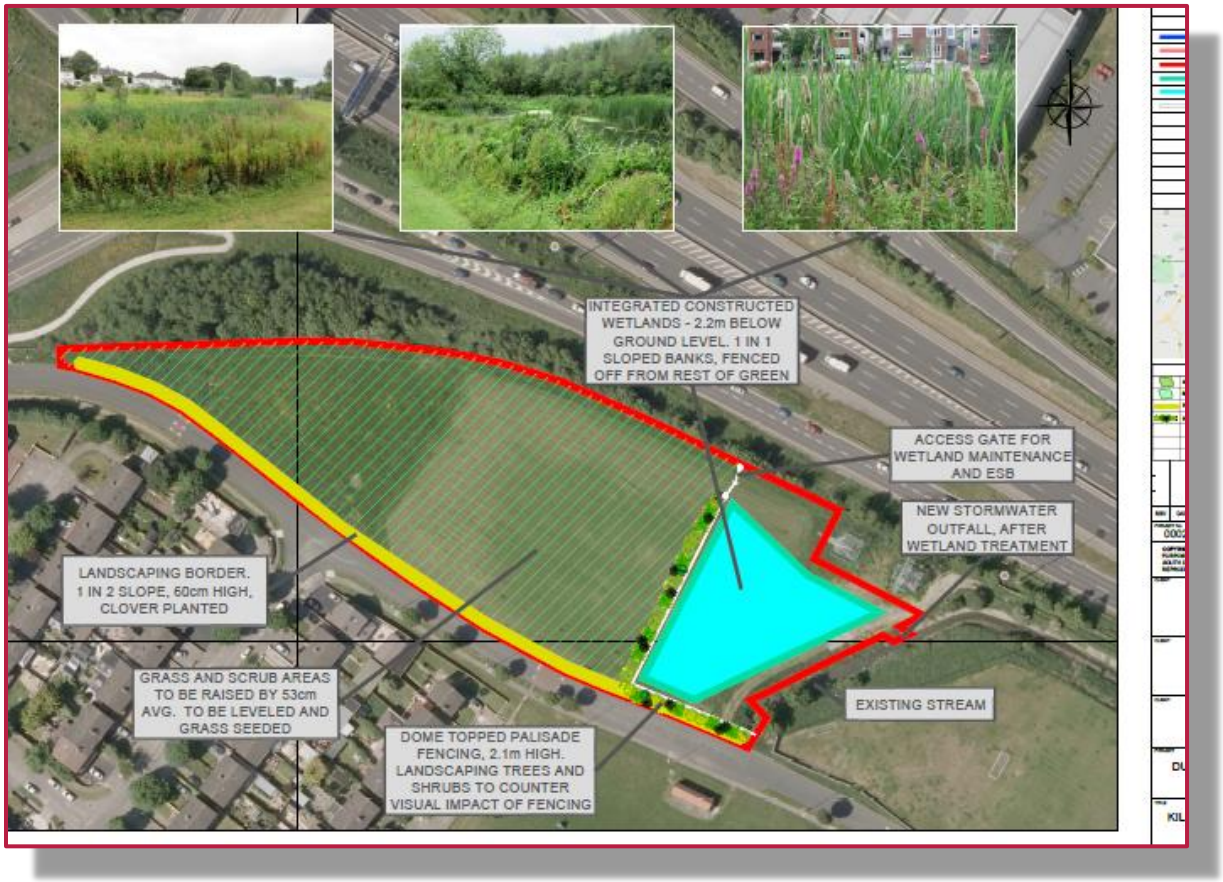
INTEGRATED CONSTRUCTED WETLAND - KILNAMANAGH

PROPOSED PART 8 TO BUILD AND INTEGRATED CONSTRUCTED WETLAND IN KILNAMANAGH

TO PURIFY STORMWATER IN THE KILNAMANAGH STREAM USING A NATURE BASED WETLAND SYSTEM



Prepared by Dublin Urban Rivers LIFE project

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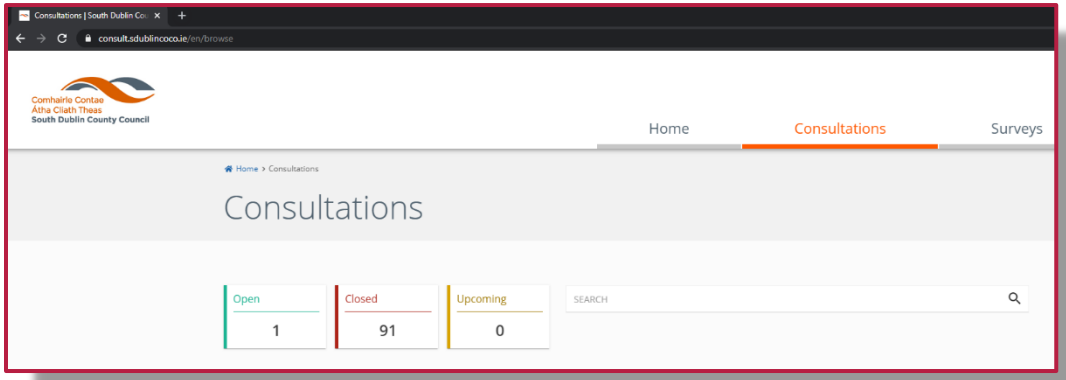
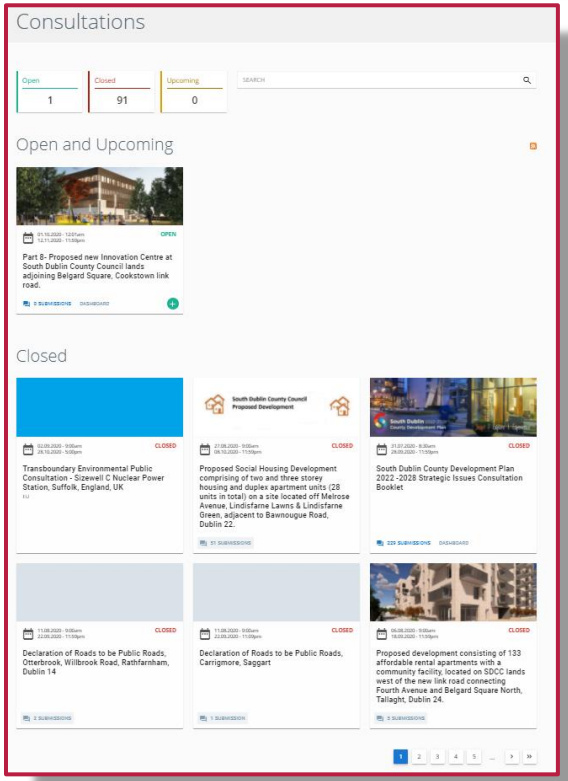




INTRODUCTION

The objective of this report is to describe the environmental needs for the Proposal, the reasons for choosing an integrated constructed wetland as an environmental solution, and the added combined benefits of the proposal.

This report should be read in conjunction with the environmental reports included with the Part 8 planning proposal package, in particular the Appropriate Assessment Screening report and the Environmental Impact Assessment Screening report.

A series of planning compliant drawings have been prepared and combined into one document as a pdf document for ease of downloading for consideration.

The proposal can be accessed on South Dublin County Council's public consultation portal https://consult.sdublincoco.ie/ and submissions on the proposal can be made using the portal or can be made in writing to the:

Senior Executive Officer,

Environment, Water and Climate Change Department,

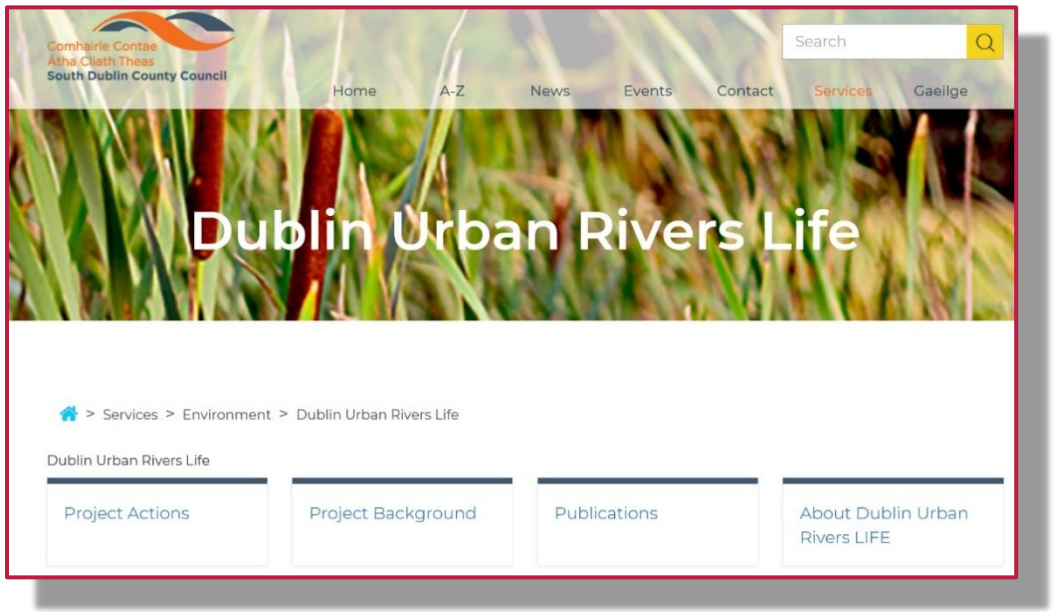
South Dublin County Council,

County Hall,

Tallaght,

Dublin 24

Eircode: D24 YNN5



DUBLIN URBAN RIVERS LIFE PROJECT

This Part 8 proposal is a component of the innovative Dublin Urban Rivers LIFE (DURL) project which is a collaborative project between South Dublin County Council (SDCC), Dun Laoghaire-Rathdown County Council and the EU LIFE Fund Programme. The project aims to transform water quality in a selection of rivers in both counties including the Kilnamanagh Stream, and this proposal is a key component in that transformation.

This project will five build integrated constructed wetlands at four strategic locations in South Dublin County for the purpose of purifying stormwater before it discharges to rivers. This purification step will improve the quality of receiving river water (including the Kilnamanagh Stream), provide flood alleviation, bioretention of particulates and nutrients, improve habitat conditions and biodiversity, and promote the relationship between green infrastructure and public wellbeing.

The project also aims to promote water quality improvement in urban areas in Ireland and Europe by making it quicker and cheaper to carry out domestic misconnection inspections using a Geographical Information System based approach, and provide a suite of educational information for homeowners and other stakeholders.

More information about the DURL project can be found at www.dublinriverlife.ie

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Life

dlr
Comhairle Contae County Council

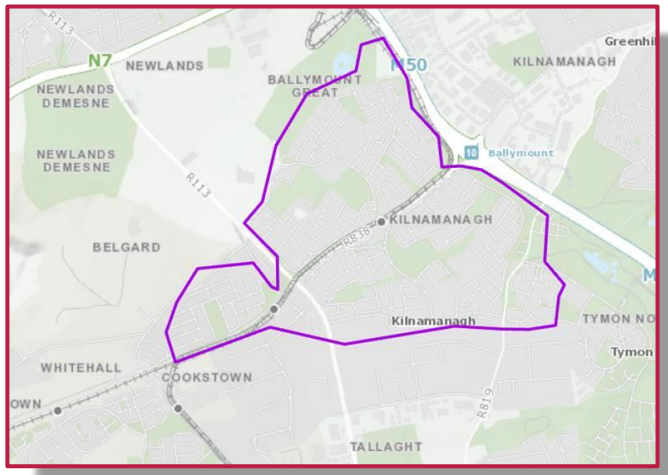
NEED FOR THE PROPOSAL

South Dublin County Council have recorded 8% domestic misconnection rates in housing estates in the county because of washing machines, dishwashers and sinks piped to the storm water drainage system. Dun Laoghaire-Rathdown County Council also found 8% of households were misconnected in their county. The effluent from these misconnected houses eventually flow to local rivers This causes pollution of those rivers. These misconnections are a source of nutrient-enrichment and microbial contamination of impacted waterbodies including the Kilnamanagh Stream.

The mitigation of untreated domestic wastewater discharges to aquatic environments will be fundamental in meeting the objectives of the Water Framework Directive. This includes discharges from domestic misconnections and pollution from common urban areas such as roads and footpaths.

In the greater Kilnamanagh Stream catchment there are approximately 2,000 dwellings and associated roading and footpath infrastructure which, in combination, are a potential significant pressure on water quality to that small river. As the urban catchment expands in the future this potential pressure will increase. Currently, the Kilnamanagh Stream frequently exceeds the prescribed maximum Good Status concentration of phosphorus and ammonia nutrients.

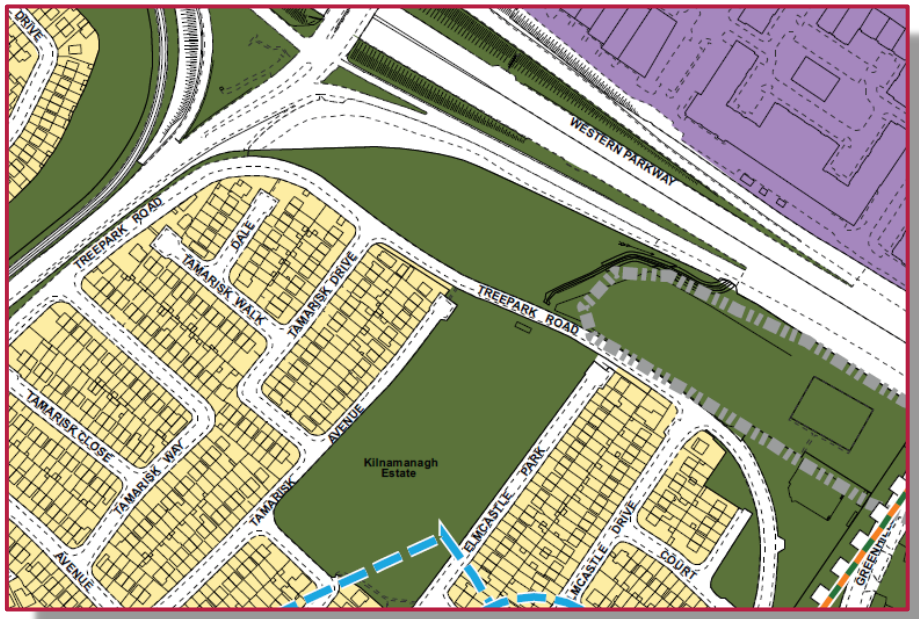
The multiple method approach of point source pollution removal and the building of a stormwater purification wetland, as per this proposal, is required if the river is to meet and maintain good and socially acceptable water quality and habitat standards.



Kilnamanagh Stream urban catchment

Kilnamanagh Stream

Kilnamanagh proposed ICW site



Objective OS — To preserve and provide for open space and recreational amenities

Draft Biodiversity Action Plan for South Dublin County 2020-2026

Action 3.3 In the preparation process for the SDCC Development Plan, innovative approaches to promote strategic biodiversity policies and objectives will be developed

POLICY CONTEXT FOR THE PROPOSAL

The two main policy documents that apply at a county level are as follows:

1. **County Development Plan 2016-2022** and the Objectives within aim to protect and improve our environment including our river environment. The important Objectives this proposal aims to fulfil are:

   IE2 Objective 3:

   To maintain and enhance existing surface water drainage systems in the County and promote and facilitate the development….including integrated constructed wetlands…to protect water quality, and

   IE2 Objective 6:

   To promote and support the retrofitting of Sustainable Urban Drainage Systems (SUDS) in established urban areas, including integrated constructed wetlands.

2. **River Basin Management Plan 2018-2021** which requires South Dublin County Council to restore (river) water quality to Good status by 2027.

The Council has a commitment in the Dublin Urban Rivers LIFE project to build 5 Integrated Constructed Wetlands (ICWs) in public parks in SDCC area, as part of that comprehensive project.

The proposal also feeds into the Biodiversity Action Plan through the innovative Dublin Urban Rivers LIFE project.

Polluted stormwater discharge to river

Environmental reports

Archaeology & Built Heritage report

County Development Plan

Proposal Designs

WHAT IS THE PROPOSAL?

The proposal is to take a portion of the total stormwater flow from the Kilnamanagh Stream in Kilnamanagh, route the flow through a wetland in the park adjacent to the stream to purify that water, and then let that purified water flow back into the Kilnamanagh Stream via a new outfall. The steps in the process of implementing the Proposal are as follows:

- Determine the need of the Proposal
- Find a site where a wetland can physically be built
- Ensure that site has no endangered plants or animals living there
- Ensure there are no archaeological structures on the site
- Ensure the proposal meets County Development Plan requirements
- Create a design proposal and bring it to the public for consultation and bring it through the planning process
- If the proposal is successful in the planning process, then prepare detail design drawings and specifications
- Tender for, and build the wetland

Once the wetland is built, schedule its long-term maintenance and care work to South Dublin County Council's Parks Department and Water Pollution Section.

It is worth noting the concept of building a wetland in a public park is not new to Dublin and two good examples are Kilbogget Park in Dun Laoghaire-Rathdown County and Tolka Valley Park in Dublin City. These wetlands are well established and provide multiple benefits to the citizens and local authorities of those areas. There are other wetlands built in other counties totalling over 100 at present. Their main purpose is to purify polluted water using a treatment system (the wetland) that is natural.

Appropriate Assessment Screening Report

"In view of best scientific knowledge therefore, this report concludes that the proposed ICW development at Kilnamanagh, individually or in combination with another plan or project, is not likely to have a significant effect on European sites under Article 6 of the Habitats Directive (92/43/EEC) in light of their conservation objectives. The proposed development does not require Appropriate Assessment."

Environmental Impact Assessment Screening Report

"Having regard to the nature and limited scale of proposed development and to the limited nature of environmental sensitivities the Preliminary Examination has concluded that there is no real likelihood of significant effects on the environment arising from the proposed ICW development at Kilnamanagh.

The need for further screening for Environmental Impact Assessment (EIA) or for Environmental Impact Assessment (EIA) can therefore be excluded on the basis of the Preliminary Examination, in accordance with article 120(1)(b)(i) of the Planning and Development Regulations 2001-2019."

Ecological Baseline Report

"This ICW location is dominated by improved grasslands and/or managed habitat features which can be classified as being of low ecological value. There were no species listed in the FPO nor any invasive species or rare/protected faunal species found within the footprint of this proposed ICW site."

ENVIRONMENTAL REPORTS

The Council commissioned several environmental field assessments and reports for the purpose of ensuring the Proposal was not going to harm our natural environment and are submitted as part of the statutory requirements of the planning process. Those reports we as follows:

- Appropriate Assessment Screening report
- Environmental Impact Assessment Screening report
- Ecological Baseline report

And

- Archaeology & Built Heritage Assessment report

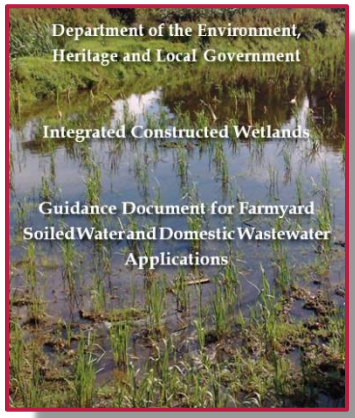
The Appropriate Assessment Screening report prepared by the environmental consultant Brady Shipman Martin stated in their overall conclusion the proposal to build a wetland is not likely to have any significant effect on environmentally conserved sites.

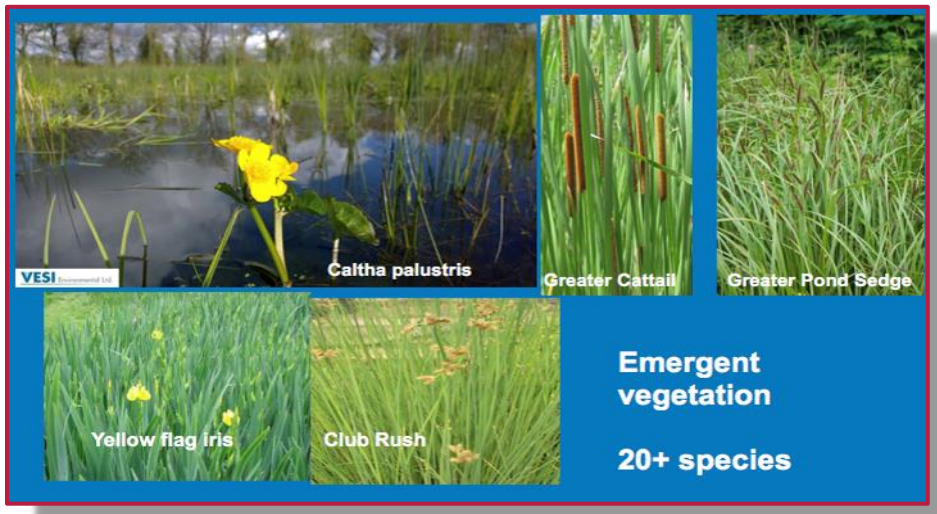
The Environmental Impact Assessment Screening report concluded due to the limited scale of the wetland and the limited sensitivities of the build location the proposal is unlikely to have any significant effect on the local environment.

The Ecological Baseline report, prepared by the consultants Roughan & O'Donovan, notes the location of the proposed wetland is improved grassland, which is of low ecological value, and no sensitive or protected species were found at the footprint of the proposed wetland.

Finally, the Archaeology and Built Heritage report noted, *"There are no known archaeological monuments or protected structure within the footprint of the proposed ICW's"* and "*It is advised that the proposed ground works be archaeologically monitored during construction to record any potential sub surface features".*

WHAT ARE INTEGRATED CONSTRUCTED WETLANDS?





The Department of the Environment, Heritage and Local Government's Integrated Constructed Wetlands (ICWs) documents sets out the principles of operation and build for ICWs in the context of Ireland. It notes.

"*An 'Integrated Constructed Wetland' (ICW) is a series of shallow, interconnected, emergent-vegetated, surface-flow wetland compartments that receive/intercept water- flows from a variety of sources.*"

The intention of the proposed ICW is to optimise stormwater treatment and integrate the benefits from its associated wetland infrastructure to deliver a wide range of environmental returns, such as the protection and enhancement of biodiversity, the delivery of good ecological status of rivers, the protection of fisheries and improved landscape aesthetics.'

The general construction of the ICWs is they have a standing water depth of approximately 30 cm, are planted with a variety of native Irish wetland plants. They are sparsely planted in the beginning and within a few years they form lush wetlands. They are low maintenance water purification systems with the added benefit of high-density biodiversity, and are visually appealing

ADDED BENEFITS OF USING WETLANDS FOR WATER PURIFICATION

The Department elaborates that by using a nature-based water purification system such as an ICW there are wider benefits.

"By adopting and implementing a strategy that integrates the management of land, water and biological resources, whilst promoting conservation and sustainable use in an equitable way, the ICW concept addresses the objectives of the EU Water Framework Directive (WFD) and has further advantages."

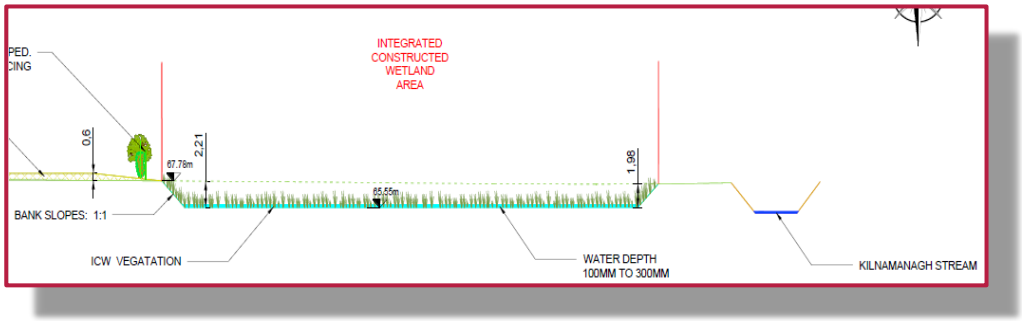
And go on to state,

"Wetlands are havens for aquatic and semi-aquatic life, both animal and plant. Over 60% of all known Irish macroinvertebrates (aquatic insect life) have been recorded in the ICW systems in the Anne Valley in Co. Waterford."

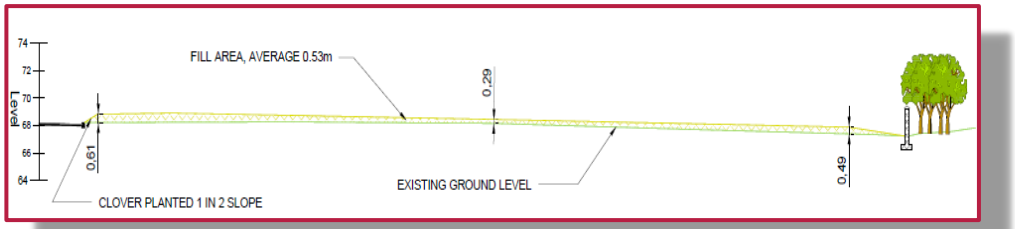
The preliminary feasibility report prepared for the Dublin Urban Rivers LIFE by Vesi Environmental Ltd notes.

"The performance of all monitored ICW systems over the past 20 years have shown them to be sustainable efficacious treatment additions to the Irish landscape whilst also providing many important additional ecosystem services. The major advantage of the ICW approach is that it explicitly looks for wider societal gains through the use of reanimated wetlands in dealing with water-vectored pollutants. The approach is broadly one that optimises benefits rather than simply maximising for pollution control alone."

Overall, the proposal to build a wetland in Kilnamanagh will positively contribute to the biodiversity of aquatic plants, insects, frogs and newts, and to the variety of border plants which will add to the pollinator credentials of the Park. It will also positively contribute the county's Climate Change Action Plan 2019-2024 as the ICWs are expected to remove (sequester) carbon from the atmosphere each year.



Typical section design of the proposed wetland



Typical section design of the proposed reinstatement of park area

WILL THE WETLAND BE SAFE?

The proposed wetland will be built with safety in mind.

The proposed wetland will have a typical standing water depth of 30 cm or approximately 1ft. which is similar to the adjacent Kilnamanagh Stream in low flow. However, the main difference is the wetland will have a limit to the amount of water it can accept and therefore, the depth of water in the wetland will not fluctuate very much over the year.

The wetland is also expected to be approximately 2.5 metres below the existing ground level with steep sides (1:1 gradient) and therefore, the wetland will be entirely fenced off with a 2-metre-high fence. There will not be any access to the wetland by the public. However, it is intended to explore the option to provide viewing portals in the surrounding fence for the public to view into the wetland and appreciate its wildlife.

The public area outside the wetland fence will be tastefully landscaped in-keeping with the Council's Parks Department standards for such a development. Please see separate Proposal drawings document for detail.

Finally, it should be noted it is the intention of the Proposal to reuse the excavated soil from the wetland area to reinstated the opposite end of the park area and to raise the entire park area by approximately 0.5 metres and reinstate to grassland for the park area in keeping with the Council's Parks Department standards.

TYPICAL PLANTS SEEN AT A WETLAND

Table provided by Vesi Environmental Ltd.

Table 3: Example wetland species

						
Glyceria maxima	*Carex riparia*	*Typha latifolia*	*Iris pseudacorus*	*Typha angustafolia*	*Ranunculus lingua*	*Lythrum salicaria*

MAIN SPECIES PLANTED IN THE WETLAND

Table provided by Vesi Environmental Ltd.

Table 1: Main species used in ICW

Botanical name	Common name	Flowering period	Max height	Max water depth	Summer	Winter
Glyceria maxima	Reed sweet grass	Jun – Aug	2.5m	0 – 60cm		
Carex riparia	Common sedge	May – Jun	1.5m	0 – 30cm		

Botanical name	Common name	Flowering period	Max height	Max water depth	Summer	Winter
Typha latifolia	Reed mace	Jun – Aug	2.5m	10 – 80cm		
Iris pseudacorus	Yellow flag iris	May – Jun	1.0m	0 – 20cm		Deciduous Not visible in winter
Typha angustafolia	Small reed mace	Jun - Jul	3.0m	0 – 15cm