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Engineering Services Report
Proposed Cemetery Development
City West, Saggart, County Dublin.

Client: Cape Wrath Hotel Unlimited

Job No. T058





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ENGINEERING SERVICES REPORT

PROPOSED CEMETERY DEVELOPMENT, CITY WEST, SAGGART, COUNTY DUBLIN.

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BS 1192 FIELD T058-CSC-Z			Z-XX-RP-C-0002-P1 Engineering Services Report					
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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned to prepare an Engineering Services Report to accompany a planning application for a proposed cemetery at City West Saggart, County Dublin.

This report assesses the proposed development under the following headings:

- Foul Drainage Infrastructure
- Stormwater Drainage Infrastructure
- Potable Water Infrastructure.
- Site Access

In preparing this report, CS Consulting has made reference to the following:

- South Dublin Development Plan 2022–2028,
- Regional Code of Practice for Drainage Works,
- The Greater Dublin Strategic Drainage Study,
- Irish Water Code of Practice for Water,
- Irish Water Code of Practice for Wastewater,
- Local Authority Drainage Records.

The Engineering Services Report is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, as part of the planning submission.



2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The proposed development site is located in City West, Saggart, County Dublin. The site is located in the administrative jurisdiction of South Dublin County Council and has a total area of circa 13.45 ha.



Figure 1 – Site location Indicated in Yellow (map data: Google Maps)

The location of the proposed development site is shown in Figure 1 above.

The site is bounded by the N7 National Road to the north, Garters Lane to the east, and the existing City West Complex to the south and west.



2.2 Existing Land Use

The subject site is currently configured to be a golf course, with associated water courses and golf relief features.

2.3 Proposed Development

The development will consist of a cemetery including: 8,047 No. traditional burial plots; Columbarium walls; 1 No. single storey reception building (214.7m² Gross Floor Area (GFA)) comprising a reception, 1 No. office, 1 No. reception store, WC, kitchenette with photovoltaic (PV) solar panels at roof level; and the provision of an ancillary maintenance shed, bin and battery storage structures.

The development includes a new vehicular access road from Garters Lane to the N7/M7 Naas Road, with 2 No. vehicular access points serving the proposed cemetery; 110 No. car parking spaces (25 No. spaces to the east of the reception building and 85 No. within overflow car park areas to the south of the development); 8 No. bicycle parking stands; and all associated hard and soft landscape and boundary treatment works including the reshaping of an existing lake and provision of a footbridge; provision of SUDS measures, associated lighting, associated signage, site services (foul and surface water drainage and water supply); and all other associated site excavation, infrastructural and site development works above and below ground.

Refer to Tom Philips & Associates submission with this application for a detailed breakdown of the proposed development.



3.0 FOUL DRAINAGE

3.1 Existing Foul Drainage Infrastructure

South Dublin County Council's drainage records indicate an existing 225mm diameter foul sewer traversing the subject lands from west to east. This sewer connects into an existing sewer flowing south to north. It is proposed to divert a section of the existing 225mm foul sewer, which is currently not live. See **Figure 2** for the section to be diverted & drawing **CTW-CSC-ZZ-XX-DR-C-0101** For details of same.

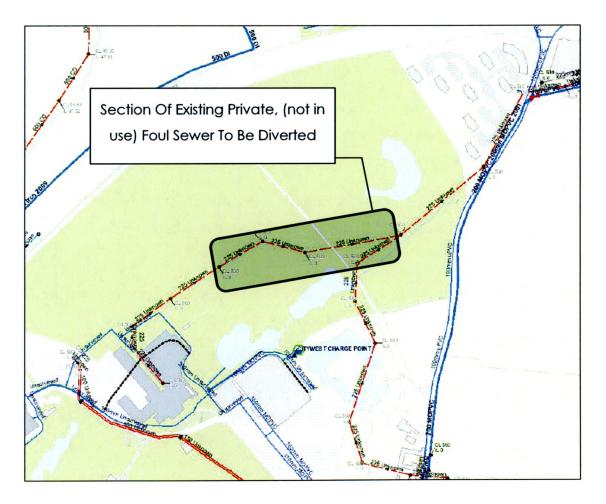


Figure 2 – Existing Services Crossing The Subject Lands

(map data: Irish Water Records)



See **Appendix A** for South Dublin County Council's drainage records.

3.2 Proposed Foul Drainage Arrangements

The proposed development is to consist of burial & comfort facilities for the proposed cemetery. It is estimated that up to 500 people may use the proposed complex during its most demanding period. Irish Water give an effluent generation rate of 40l/person/day.

- \Rightarrow 401/day/person x 500 people = 20,000 l/day = 20 m³/day;
- \Rightarrow 0.22 l/sec Average flow (1 DWF);
- \Rightarrow 1.38 l/sec Peak Flow (6 DWF).

All foul effluent generated from the proposed development shall be collected in separate foul pipes and flow under gravity, to the existing 225 mm diameter foul sewer on the subject lands.

The drainage network for the development shall be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

The proposed foul water drainage infrastructure and routing plan is shown on drawing CTW-CSC-ZZ-XX-DR-C-0103.



4.0 STORMWATER DRAINAGE

4.1 Existing Stormwater Drainage Infrastructure

Following receipt of SDCC drainage records (see **Appendix A**) there is no storm water sewer crossing the subject lands. The subject lands are no longer used as a golf course. Its previous use led to an artificial storm water system, of ditches and ponds, crosses the site before existing to the east.

There is a pumped stormwater system from the northern apartment block, (Westpark Apartments), which outfalls an attenuated storm water flow into an existing water feature on the golf course. It is proposed to reroute this outfall, within the application site & without interference to the adjacent neighbour's drainage system, see drawing CTW-CSC-ZZ-XX-DR-C-0101.

4.2 Proposed Stormwater Drainage Arrangements

In accordance with the requirements of SDCC Drainage Division all new developments are to incorporate the principles of Sustainable Urban Drainage Systems, (SuDs). The SuDs principles require a two-fold approach to address storm water management on new developments.

The first aspect is to reduce any post development run-off to predevelopment discharge rates. The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1 in 100 year storm event increased by 20% for predicted climate change factors.

To ensure an accurate calculation of the required attenuation for the site Met Eireann was contacted to provide:

a) The SAAR (Standard Annual Average Rainfall) for the area: 731mm/year



b) The sliding duration table for the site indicating the 1:100 year rainwater intensities to be used.

The proposed site, where hard standing is to be introduced will be attenuated to 2.01/sec/Ha. The majority of the site will use infiltration systems to allow storm water generated on site to infiltrate into the subsoil. The proposed building located close to the existing pond will require storm water attenuation. The volume required for the 1-in-100 year event (increased by 20%) is 163m3. This volume will be provided in the reengineered pond. The current pond serves as part of the golf course and will be redeveloped as a water feature for the development. See **Appendix B** for the attenuation calculations.

The second aspect is the policy of the Local Authority is to include Sustainable Urban Drainage Systems, SuDS, for all new applications, as such it is proposed to use a range of SuDS devises for the scheme they are listed below:

SuDs proposals are as follows;

- · Permeable Paving to all new parking spaces,
- Waterbutts for local irrigation and washing down areas,
- Attenuation tank with flow control device, sized to contain a 1-in-100-year storm event and increased by 20% for predicted climate change to limit the surface water discharge from the site during extreme rainfall events,
- Proposed roads areas will be drained via porous surfacing. This will allow any storm water generated on site to recharge the ground water table.



 As the vast majority of the site will be grass/porous surfaces the scheme will fully allow storm water generated on site to drain into the subsoil. See Drawing No. CTW-CSC-ZZ-XX-DR-C-0102 for the proposed drainage layout.

The subject lands currently has a pond on the site which forms part of the previous lands use as a gold course. It is proposed to modify the general geometry of the lake but to retain it. The lake will allow storm water generated on site from the proposed building to be stored in the lake. The lake has an existing connection to the water coarse which passes through the subject lands. This connection which operates with a high level overflow will be maintained.

The proposal to include a new access road from Garters Lane, will require that a section of the existing water course to be culverted to allow the roads construction.



5.0 POTABLE WATER SUPPLY

5.1 Existing Potable Water System

Records obtained from Irish Water indicate public watermains (200mm diameter MoPVC) adjacent to the development site on Garters Lane and on Fortunestown Lane.

5.2 Proposed Potable Water System

It is proposed to make a new connection off the existing watermain on Garters Lane to the development site and supply a 100mm diameter watermain to the proposed development site.

It is estimated that up to 500 people may use the proposed facility during its most demanding period. Irish Water give an effluent generation rate of 401/person/day.

- \Rightarrow 401/day/person x 500 people = 20,000 I/day = 20 m³/day;
- \Rightarrow 0.22 l/sec Average flow (1 DWF);
- \Rightarrow 1.14 l/sec Peak Flow (5 DWF).

All firefighting & potable water requirements will be fed off this proposed main. Refer to drawing CTW-CSC-ZZ-XX-DR-C-0104 for details.



6.0 PROPOSED ROAD & ACCESS

- 6.1 The scheme will access the site off Garters Lane to the east of the subject lands. The roads have bene designed in accordance with the requirements of South Dublin County Council. Refer to drawings CTW-CSC-ZZ-XX-DR-C-0105 for detail of the overall road layout. For swept path analysis see drawings CTW-CSC-ZZ-XX-DR-C-0107 & 108 for details.
- 6.2 A traffic & transportation assessment for the proposed development has been undertaken by NRB consulting Engineers and has been submitted with this application as a separate document.



7.0 HYDROGEOLOGICAL ASSESSMENT OF THE SITE

Due to the proposed nature of the development a detailed hydrogeological assessment of the site was required to be undertaken. The client commissioned Verde to complete same. Their report (Environmental & Hydrogeological Assessment Report for Proposed Cemetery Site, Citywest, Co. Dublin, Report Ref.: 53811) has bene lodged under a separate cover with this submission.

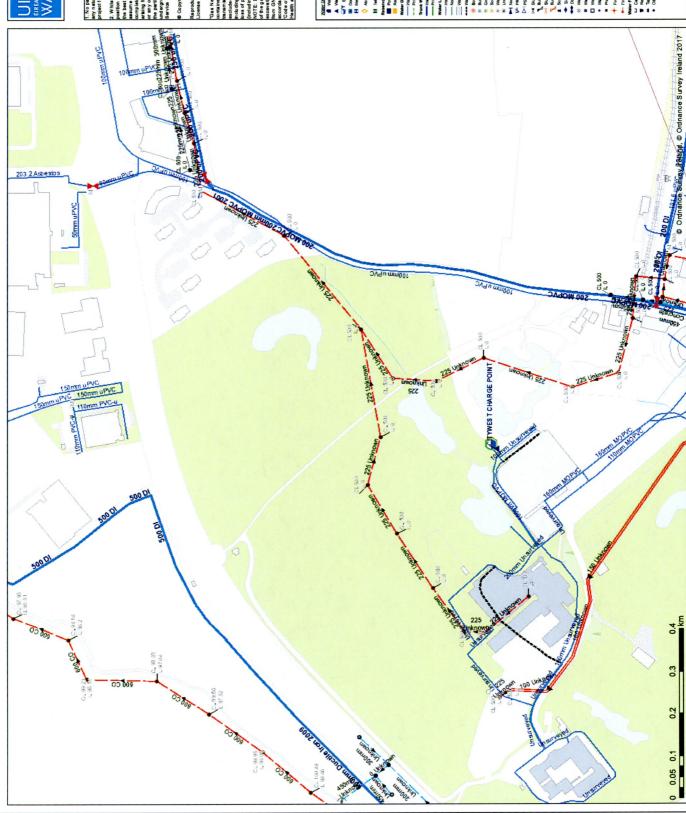


Appendix A: South Dublin County Council & Irish Water Records





Irish Water Web Map



Printed by: Irish Water

Print Date: 09/12/2020

Water Distribution Network	Sewer Foul Combined Network	Sform Water Network
Water Treatment Plant	Waste Water Treatment Plant	Surface Water Mains
▲ Water Pump Station	▲ Waste Water Pump station	Surface Gravity Mains
✓ Storage Cell/Tower	Sewer Mains Irish Water	Surface Gravity Mains Private
	Gravity - Combined	Surface Water Pressurised Mains
Meter Station	Gravity - Foul	Surface Water Pressurised Mains Private
	- Gravity - Unknown	inict Type
Abstraction Point	- Pumping - Combined	Gully
M Telemetry Koak	Pumping - Foul	
Beenvole	Pumping - Unknown	O Diher; Unknown
Breskie	Syphon - Combined	Storm Manholes
	Syphon - Foul	
HOW WANTE	- Overflow	O Backdrop
Water Distribution Mains	Sewer Mains Private	
A PARTY NAME	Gravity - Combined	Calculate
20011	- Gravity - Foul	Brucation
Trunk Water Mains	Gravity - Unknown	() Halchbox
Inth Wiler	Pumping - Combined	Lamphole
TIVE	Pumping - Foul	▲ Hydrobrake
Water Lateral Lines	Pumping - Unknown	Other; Unknown
- Irish Water	Syphon - Combined	Storm Culverts
Won W	Syphon - Foul	Storm Clean Outs
Water Casings	Overflow	
Water Abandoned Lines	Sevver Lateral Lines	Slomwater Chambers
Boundary Meter	Sevier Casings	Discharge Type
N. Bulk/Check Meter	Sewer Manholes	- Ontail
Group Scheme	Standard	Overflow
Source Meter	O Backdrop	Soskaway
W Waste Meter		or &* " Other, Unknown
8: Unknown Meter; Other Meter	Catchpit	Gas Networks Ireland
Non-Return	Bilurcation	Transmission High Pressure Gasline
IF PRV	Hatchbox	Distribution Medium Pressure Gasline
^Sd ∑	Lamphole	- Distribution Low Pressure Gastine
States Line Valve Doen Closed	Hydrobrake	ESB Networks
A Butterfiv Line Valve Oren/Closed	O Other Unknown	ESB HV Lines
States Brandary Volum Oranic Descriptions	Machana Tura	HV Underground
Bulland Bounday Value Open Change	1	HV Overhead
Southerny Boundary varie Openingse	Outsi	HV Abandoned
Scori varves	Overflow	ESB MVLV Lines
Single Air Control Vaive	Soakaway	MV Overhead Three Phase
	Standard Outlet	MV Overhead Single Phase
Water Stop Valves	o' 4* Other: Unknown	- LV Overhead Three Phase
	Cleanout Type	LV Overhead Single Phase
■ Water Distribution Chambers	RE Bodding Era	- MVLV Underground
 Water Network Junctions 	Connect Eye	Abandoned
Pressure Monitoring Point	C Fluening Structure	Non Service Categories
File Hydrant	Carer, Unanown	Proposed
The state of the s	Signal Lines	Out of Section
		Decomplished a
Water Pittings	1	
	Danish	WALLET NOT SERVICE ASSESSED.
- Tan	Control Control	The Water Pine
Other Filtines	Sever Fillings	Water Structure
	VendCol	Waste Non Service Assets
	Other, Unknown	X Waste Point Feature



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Appendix B: Attenuation Calculations

Date:

Citywest - Cemetery

T058

Attenuation 100-year - Catchment -A - Building

Project: Project No.: Calculation: Calcs By: Checked By:

PJC **RFM** 2/11/22 CS CONSULTING

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DUBLIN - LONDON - LIMERICK

Site Location:	Dublin	
Design Storm Return Period:	100 years	
Climate Change Factor:	20 %	
Soil Type:	2	
Total Site Area:	0.2000 ha	
Hardstanding:	0.2000 ha	@ 100%
Grassed Areas: Drained	0.0000 ha	@ 0%
Not Drained	0.0000 ha	@ 0%
Effective Impermeable Area:	0.2000 ha	

Allowable Outflow	Calculate	
IH124: QBAR = 0.00108 x AREA ^{0.85}	x SAAR ^{1.17} x SOIL ^{2.17}	
AREA:	0.00 km ²	
SAAR:	808 mm	
SOIL:	0.3	
QBAR/ha	2.16 l/s/ha	
Allowable Outflow	2.0 l/s	Smallest Allowable Discharge Rate (2l/s)

Storage required =	163 m ³
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Duration	Rainfall 100-Year	Rainfall 100-Year with CCF	Intensity	Discharge (Q = 2.71iA)	Proposed Runoff	Contiguous Land Runoff	Total Runoff	Allowable Outflow	Storage Required
(min)	(mm)	(mm)	(mm/hr)	(l/s)	(m ³)	(m ³)	(m ³)	(m ³)	(m³)
5	18.2	21.8	262.1	142	43	0	43	1	42
10	25.4	30.5	182.9	99	59	0	59	1	58
15	29.9	35.9	143.5	78	70	0	70	2	68
30	37.5	45.0	90.0	49	88	0	88	4	84
60	47.1	56.5	56.5	31	110	0	110	7	103
120	59.2	71.0	35.5	19	139	0	139	14	124
180	67.6	81.1	27.0	15	158	0	158	22	137
240	74.3	89.2	22.3	12	174	0	174	29	145
360	84.9	101.9	17.0	9	199	0	199	43	156
540	97.1	116.5	12.9	7	227	0	227	65	163
720	106.7	128.0	10.7	6	250	0	250	86	163
1080	121.9	146.3	8.1	4	285	0	285	130	156
1440	134.0	160.8	6.7	4	314	0	314	173	141
2880	145.9	175.1	3.6	2	342	0	342	346	-4
4320	156.3	187.6	2.6	1	366	0	366	518	-152
5760	165.6	198.7	2.1	1	388	0	388	691	-303
8640	181.8	218.2	1.5	1	426	0	426	1037	-611
11520	195.9	235.1	1.2	1	459	0	459	1382	-924
14400	208.7	250.4	1.0	1	489	0	489	1728	-1239
17280	220.4	264.5	0.9	0	516	0	516	2074	-1558
23040	241.7	290.0	8.0	0	566	0	566	2765	-2199
28800	260.9	313.1	0.7	0	611	0	611	3456	-2845
36000	282.8	339.4	0.6	0	662	0	662	4320	-3658



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