TORQUE

CIVIL STRUCTURAL | CONSULTING ENGINEERS

18/11/2021

ENGINEERING SERVICES REPORT & FLOOD RISK ASSESSMENT

FOR

NEW PROPERTY AT

No. 6A BODEN VILLAS, BALLYBODEN,

DUBLIN 16

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18th November 2021

INDEX:

APPENDED:

NOTICE

DOCUMENT CONTROL & HISTORY

Job No. L021		Document Ref.: L021 – ESR & FRA for New property at No. 6A Boden Villas, Ballyboden, D16				
Rev.	**Status**	**Authors**	**Checked**	**Reviewed**	**Authorised**	**Issue Date**
8						
7						
6						
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0	Issued	Arthur Shirran	Arthur Shirran	Ken Moriarty	Ken Moriarty	18/11/2021

ENGINEERING SERVICES REPORT & FLOOD RISK ASSESSMENT FOR NEW PROPERTY AT No. 6A BODEN VILLAS, BALLYBODEN, DUBLIN 16

18th November 2021

1. INTRODUCTION

Torque Consulting Engineers have been instructed to prepare an Engineering Services Report & FRA for a proposed new house at the rear of No. 6 Boden Villas, Ballyboden, Dublin 16.

The site is 0.041 Hectares, in area, See ***Figure 1*** & ***2*** below for site location and this was originally the rear garden of No. 6 Boden Villas.

The site is located within the administrative jurisdiction of South Dublin County Council and is bounded by;

- Taylor's Lane to the North;
- Palmer Park to the East;
- Existing residential properties to the West
- Existing drainage ditch/ stream to the South

The site is currently green field site.

The proposed development will involve the construction of a single residential unit with flat roofs

Site Location

Figure 1. Site Location - Perspective view

Figure 2. Site Location – OS map view

2. SCOPE

This report was compiled by reviewing available data from the design team, Local Authority sources and national bodies, i.e. Flood mapping site www.Floodinfo.ie, South Dublin County Council and the Design Team.

This report addresses:

- Stormwater Drainage;
- Foul Water Drainage;
- Potable Water Supply;
- Flood Risk.

All design calculations will be accordance with:

- Local Authority requirements;
- Irish Water specifications and details;
- BS EN 752 – Drainage Outside Buildings;
- The Building Regulations – Technical Guidance Document 'H';
- Recommendations for Site Development Works for Housing Areas, Dept. of Environment, 1998;
- Office of Public Works, The Planning System and Flood Risk Management, November 2009.

Other elements of the application pertaining to landscaping/planning or architectural issues are covered by other members of the design team.

3. FOUL DRAINAGE

It is proposed to construct a new foul drainage network in accordance with BS EN 752, The Building Regulations Part 'H' & the Regional Code of Practice for Drainage Works.

It is proposed that the foul flows will be directed by gravity to the existing foul water sewer that runs along Palmer Park. Based on the LA public record information the existing sewer is a 225mm dia. vitrified Clay sewer which runs northwards. All new foul drainage will be laid in PVC pipes to suitable falls to accommodate and ensure self-cleansing velocities.

All pipes, rising mains, pumping station and manholes be constructed in accordance with Irish Water requirments and details.

From Irish Water's *"Code of Practice for Wastewater Infrastructure"* the recommended flow per person is 150 litres/day for a residential development. The proposed drainage scheme is designed and detailed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works.

Wastewater loading rates

IW-CDS-5030-03 (Revision 1 - December 2017)

Flow Rates for Design

Per person / activity / day (unless otherwise specified)	FLOW (Litres)
DOMESTIC DWELLINGS	
Standard residential	150
Mobile home type caravans with full services	150
INDUSTRIAL	
Office / Factory without canteen	50
Office / Factory with canteen	100
Open industrial site, e.g. construction, quarry, without canteen	60
*Full-time Day Staff	90
*Part-time Staff (4 hr shift)	45
SCHOOLS	
Non-residential with canteen cooking on site	90
Non-residential without a canteen	50
Boarding school (i) residents	175
Boarding school (ii) day staff (including mid-day meal)	90
HOTELS, PUBS & CLUBS	
Hotel Guests	250
Residential Training/Conference Guest (inclusive all meals)	350
Non residential Conference Guest	60
Public House Patrons	12

Holiday Camp Chalet Residents		227
Resident Staff		180
Restaurants	- Full Meals	30
Restaurants	- pre-prepared catering	25
Restaurants	- Snack Bars & bar meals	15
Restaurants	- Function Rooms including buffets	15
Restaurants	- Fast Food i.e. (roadside restaurants)	12
Restaurants	- Fast Food Meal (burger chain and similar)	12
Students (Accommodation only)		100
AMENITY SITES		
Toilet Blocks (per use)		10
Toilet (WC) (per use)		10
Toilet (Urinal) (per use)		5
Toilet Blocks in long stay car parks/lorry parks (per use)		10
Shower (per use)		40
Golf Club		20
Local community sports club, e.g. squash, rugby & football		40
Swimming (where a separate pool exists without an associated sports centre)		10
Health Club/Sports Centre		50
Tent Sites		75
Caravan Sites	(i) Touring not serviced	100
Caravan Sites	(ii) Static not serviced	100
Caravan Sites	(iii) Static fully serviced	150

Figure 3 Wastewater – Loading rates[1]

[1] Extract from Code of practice for wastewater infrastructure

Total Foul flow rate calculation

Population Equivalent:

3 no. three bed domestic dwelling:

(5 people per 3 bed dwelling) 5 persons (TBC)

Flow Allocation:

Domestic dwelling (EPA guidelines) 150 l/person/day

Flow Calculations:

Domestic dwelling $(150\ x\ 5)x10^{-3}$ $= 0.75\ m^3\ daily$

Total Daily Flow: **0.75 m³/day**

Average flowrate (DWF): **0.015litres/sec** (over 14-hour duration)

Calculations: $[(0.75)/(14x60x60)]x1000 = 0.015L/s$

Estimated peak flow (6 DWF): **0.09 litres/sec**

Trapped manholes will not be used, to comply with the Irish Water guidance and recommendations.

Refer to **Appendix A** for the Proposed Foul Water, Surface Water and Watermain layout drawing.

4. SURFACE WATER DRAINAGE

The guidelines for the design of surface water require the incorporation of Sustainable Drainage Systems as per the Greater Dublin Strategic Drainage Study. The proposed drainage scheme is designed and detailed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works incorporation of Sustainable Drainage Systems as per the Greater Dublin Strategic Drainage Study. The rainwater discharging from the roofs will discharge to a separate new surface water drainage network.

The proposed property has insufficient garden space to allow an underground percolation tank to be installed. This is due to the various minimum distances which need to be maintained around a percolation area.

On this we need to maintain the following clearances:

- To proposed foundations = 5 m
- To boundaries = 3 m
- To the stream running to rear of the site = 10 m

To comply with sustainable drainage requirements, we propose the following two stage treatment process for the surface water:

1. **Green Roof:** A green roof will be provided to the new lower roof (southern roof), the upper roof will be reserved for solar panels.
2. **Permeable surfaces:** Permeable paving will be provided to all paved areas surrounding the house and, in the gardens/ driveway
3. **Attenuation of flows from rain events:** Gravel filled underground attenuation area filled with a flow restrictor. This will provide further treatment of the water and slow its release into the surface water sewer adjoining the site. The attenuation area has been sized to accommodate a 100-year return period storm event, with an additional 20% allowance for climate change. Please refer to proposed drainage plan drawing in the appendices.

The existing site is the rear lawn of the existing property No. 6 Boden Villas. The proposed development will entail additional hard surface areas as follows:

Proposed Hard surfaces:	
Proposed roof area	105 m^2
(Of which green roof	43 m^2)
Proposed soft/ permeable landscape	257 m^2 (Permeable surfaces)
	407 m^2

Note on treatment stage: Green Roof

Figure 4: Green roof section [Vegitolid.com]

During the treatment stage, the vegetation within the green roof will give the following benefits:

- slow the rate of runoff from the roof
- filter air particulates
- produce oxygen
- absorb and trap heat

JOB NAME:	JOB NO:	DATE:
No 6A BODEN VILLAS, BALLYBODEN	L021	18/11/2021
TITLE:	**CALCS BY:**	**CHECK'D.**
SURFACE WATER STORAGE REQUIREMENTS	AS	KM

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SURFACE WATER STORAGE

Storm Return Period =	100	Years		
Total Site Area =	0.0407	Hectares (ha)		
Proposed Impermeable Area				
Roof Area =	0.0148	ha	100%	Impermeable
Hard Surface =	0.0000	ha	100%	Impermeable
Open Area =	0.0257	ha	0%	Impermeable
Total Impermeable Area =	0.0148	ha		

Site Location (Select from tabs below) — Ballinteer

Allowable Outflow = 2 litres/sec/ha (Dublin City Council, stormwater management Policy)

2 litres/sec (Minimum flow restrictor size available)

Duration (min)	Rainfall 100 Year (mm)	Intensity (mm/hr)	Discharge Q (= 2.71AI) (l/s)	Proposed Runoff (m^3)	Contiguous Land Runoff (m^3)	Total Runoff (m^3)	Allowable Outflow (m^3)	Storage Req'd (m^3)
2	6.1	183.0	7	1	0	1	0.2	0.6
5	11.1	133.2	5	2	0	2	0.6	1.0
10	16.5	99.0	4	2	0	2	1.2	1.18
15	**21.0**	**84.0**	**3**	**3**	**0**	**3**	**1.8**	**1.23**
30	29.0	58.0	2	4	0	4	4	1
60	37.0	37.0	1	5	0	5	7	-2
120	46.0	23.0	1	7	0	7	14	-8
240	57.0	14.3	1	8	0	8	29	-21
360	67.0	11.2	0	10	0	10	43	-34
720	86.0	7.2	0	12	0	12	86	-74
1440	103.0	4.3	0	15	0	15	173	-158
2880	123.0	2.6	0	18	0	18	346	-328
4320	0.0	0.0	0	0	0	0	518	-518

Storage required = 1.23 m^3 — Stormcell Requirement = 1.8 m^3

ALLOW 20% EXTRA FOR CLIMATE CHANGE = 1.48 m3

Oversized Pipe Requirements

Pipe dia (mm)	Length (m)
300	20.9
600	5
1050	2
1200	1
1350	1

Twin Pipe Requirements

DIA (mm)	AREA/ PIPE (m^2)	TOTAL AREA (m^2)	LENGTH REQ'D (m)
525	0.216	0.433	3
600	0.283	0.565	2
900	0.636	1.272	1
1050	0.866	1.732	1
1200	1.131	2.262	1

Figure 5. Attenuation calculation

5. POTABLE WATER SUPPLY

The proposed water supply network is to be connected to the existing public system located in the surrounding streets. In accordance with Irish water requirments all connections are to be metred and internal fittings agreed with the Irish Water.

In accordance with best practice, new water saving devices (low water usage appliances and aerated taps etc.) will be fitted as standard into the proposed new units.

Refer to Appendix A for the Proposed Foul Water, Surface Water and Watermain layout drawing.

6. FLOOD RISK ANALYSIS

Level Of Service

The risk of a flood event is a function of the probability of occurrence in any given year. Traditionally, this has been expressed as a return period (e.g. 1-in-100-year return period). However, this has led to misconceptions about the likelihood of repeat occurrences. A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. A 1-in-100-year return period flood event is therefore expressed as a 1% AEP flood event. Likewise, a 1-in-1-year return period flood event is expressed as a 100% AEP flood event.

The Greater Dublin Strategic Drainage Study (published by the Local Authorities in the Greater Dublin Region) and The Planning System and Flood Risk Management, Guidelines for Planning Authorities set out the best practice standards for flood risk in Ireland.
These are summarised in ***Table 1***.

Flooding Source	Drainage	River	Tidal/Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible	–	>1% AEP	>0.5% AEP

Table 1: Summary of Level of Service – Flooding Source

Both the Greater Dublin Strategic Drainage Study and The Planning System and Flood Risk Management, Guidelines for Planning Authorities require that account be taken of the effects of climate change over the design life of a development, normally 100 years. Flood risk will therefore change over lifetime of a development. The Flood Risk Assessment therefore considers "present day" flood risk and "future" flood risk.

7. FLOOD RISK & MITIGATION MEASURES

FLUVIAL (RIVER) FLOODING

The site is located approximately 400m east of Owendoher river and 575m west of the Whitechurch river. A drainage ditch flows along the southern boundary of the site. Based on the availible information the development is located outside of the 0.1% AEP fluvial floodplain, see extact below and attached in the appendices.

The Floodinfo.ie website also records locations of historical flood events that have occurred. There are no records of fluvial flooding close to the site. See ***Figure 6***. The drainage ditch to the south of the site should be inspected periodically for a built up of debris, should any be noted the Local Authoriety drainge department should be informed so that they can be cleared, preventing water build up.

Therefore the risk of fluvial flooding is negligible and no mitigation measures are proposed.

Figure 6. Past Flood Events locations along with extract from River Flood maps with all probabilities shown. From www.floodinfo.ie.

TIDAL FLOODING

Due to the site's location and height above sea level, there is no historical or perceivable risk of tidal flooding of this site.

PLUVIAL FLOODING

The Floodinfo.ie website shows locations of historical flood events. There are no records of pluvial flooding (that is overland flow resulting from high intensity rainfall) in the vicinity of the site.

Although the risk from over land flooding is remote. There is a remote possibility that it may occur. The proposed design will have the ground floor level 150mm above the surrounding ground level to further protect against potential localised (though unlikely) flooding and blocked drains.

GROUNDWATER FLOODING

According to the Geological Survey of Ireland interactive maps, the subject site is located on *Butter Mountain formation rock outcrop,* this consists of a mixture of slate and quartzite, **see figure 7.**

The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is low, **see figure 8.**

There are no records of any karst features in the locality and the area is not at risk from ground water flooding (based on GSI.ie map data).

It is concluded therefore that the flood risk represented by ground water is minor.

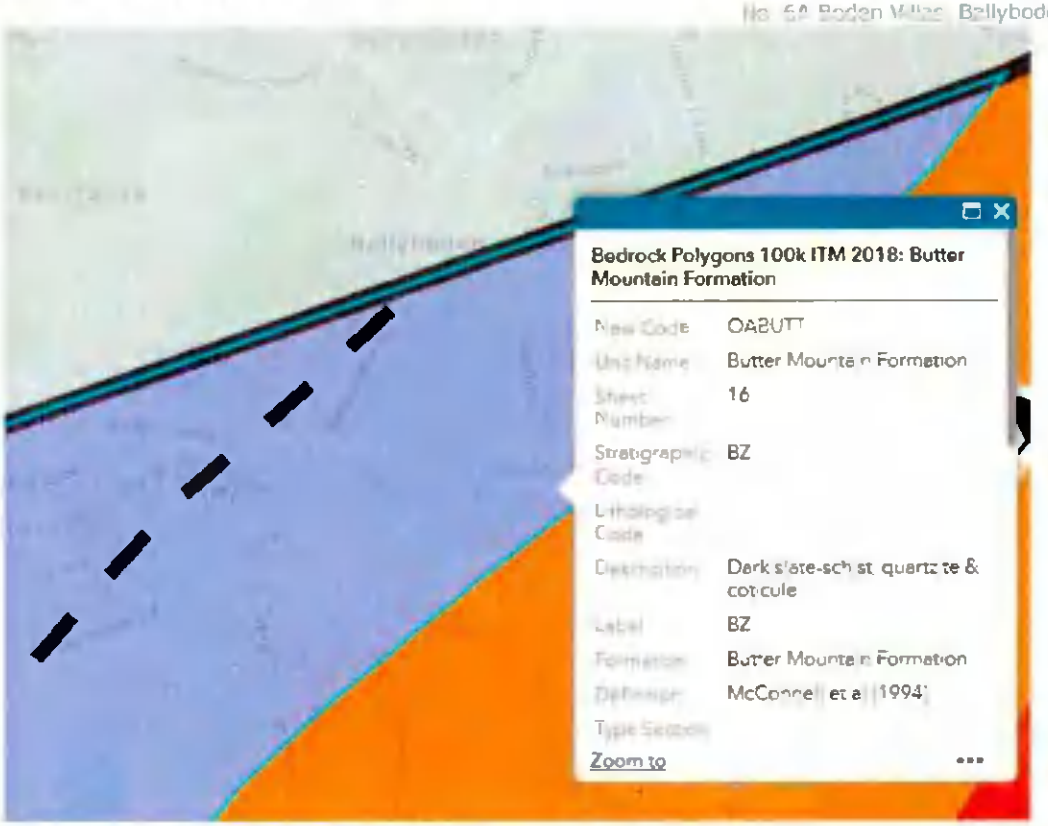

Figure 7. Extract from the GSI.ie website indicating that the site is located above bedrock of slate and quartz

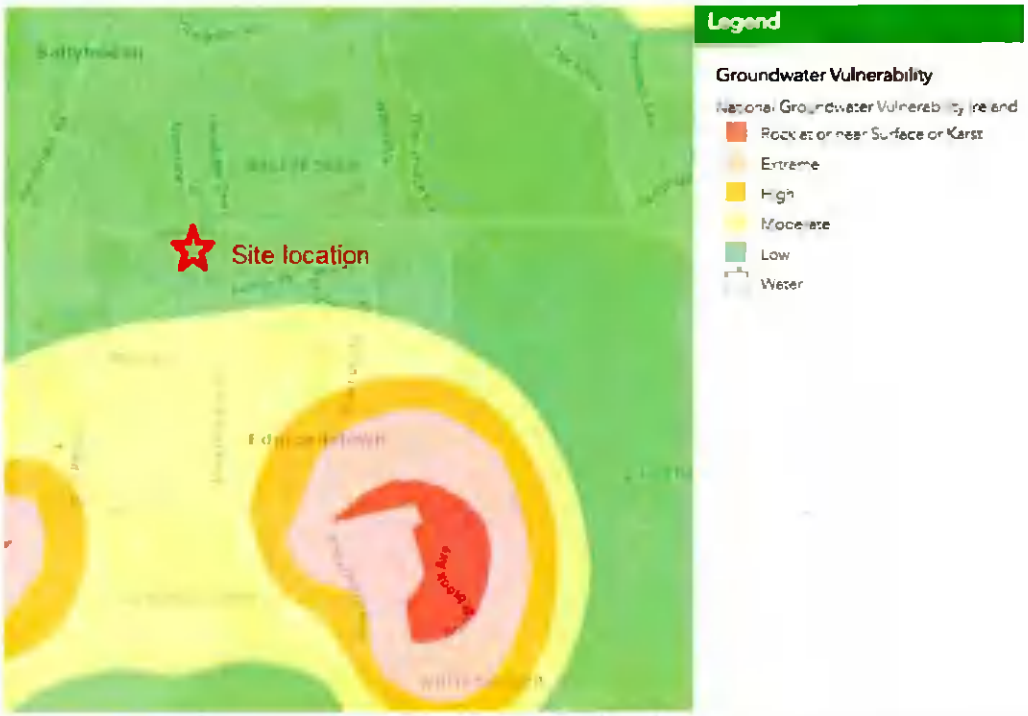

Figure 8. Extract from the GSI.ie website indicating that the site is located in an area of low groundwater vulnerability

8. REFERENCES

- Greater Dublin Regional Code of Practice for Drainage Works Version 6.0 (April 2006);
- IS EN 752: Drain and Sewer Systems Outside Buildings;
- 'Recommendations for Site Development Works for Housing Areas' by the Department of the Environment and Local Government (November 1998);
- 'Wastewater Infrastructure Standard Details' by Irish Water (April 2016);
- 'Water Infrastructure Standard Details' by Irish Water (April 2016);
- BRE Digest 365 (2007) - *Soakaway Design* - Building Research Establishment;
- CIRIA Report C697 (2007) – *The SUDS Manual* – Construction Industry Research Association;
- CIRIA Report C522 (2000) – *Sustainable Urban Drainage Systems – Design Manual for England and Wales* - Construction Industry Research Association;
- Greater Dublin Strategic Drainage Study (2005) – *Regional Drainage Policies Technical Documents* – Dublin Drainage;
- Technical Guidance Document H (2010) – *Drainage and Wastewater Disposal* – Department of the Environment, Community and Local Government;
- 'Guidelines for drinking water supply' – Water Services Department (February 2009);
- Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses.

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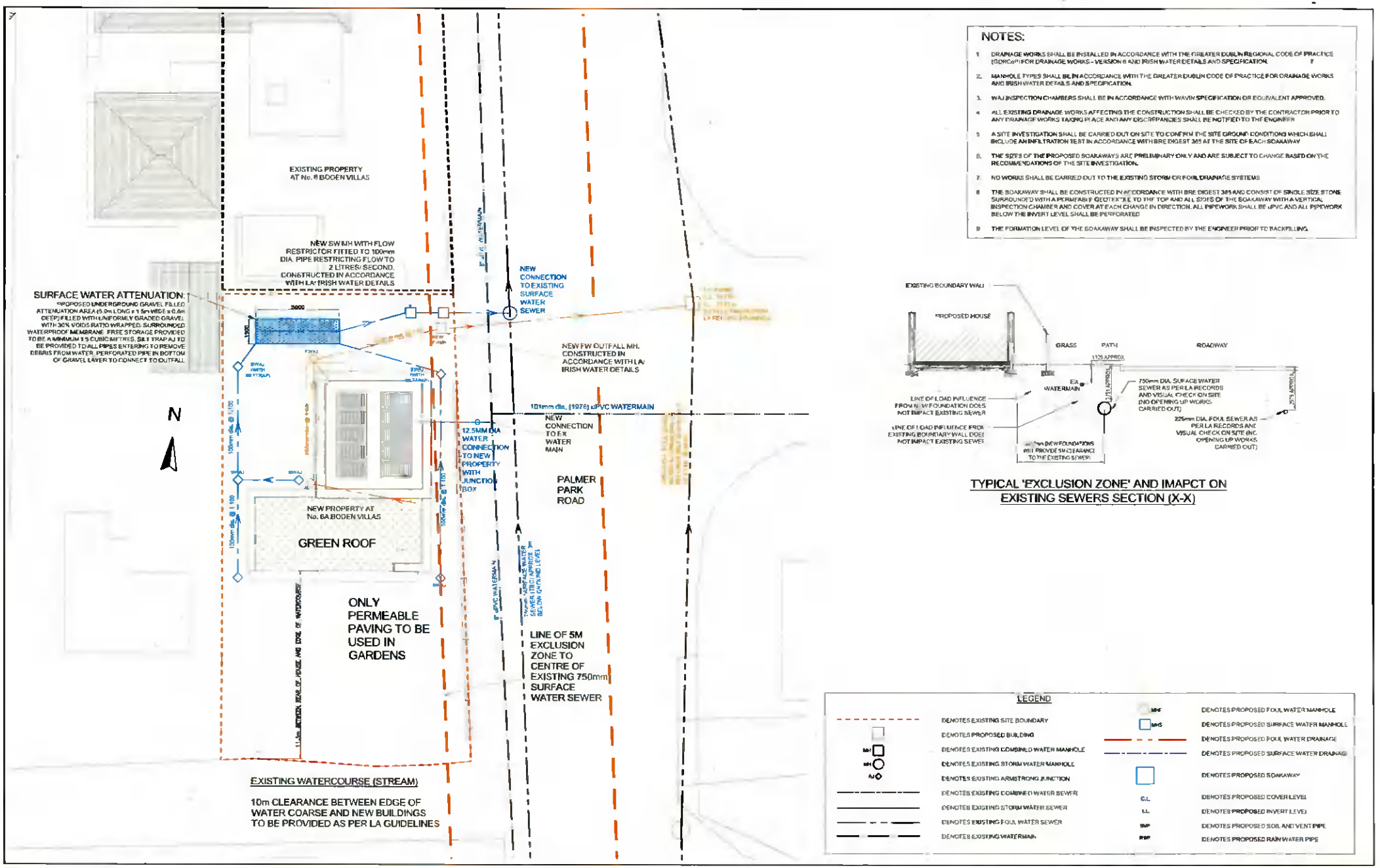
APPENDICES

D039-C001-Proposed Drainage Layout

APPENDIX A: Proposed Drainage Drawings (Proposed Drainage Layout)



NOTES:

1. DRAINAGE WORKS SHALL BE INSTALLED IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE (GDRCOP) FOR DRAINAGE WORKS – VERSION 6 AND IRISH WATER DETAILS AND SPECIFICATION.
2. MANHOLE TYPES SHALL BE IN ACCORDANCE WITH THE GREATER DUBLIN CODE OF PRACTICE FOR DRAINAGE WORKS AND IRISH WATER DETAILS AND SPECIFICATION.
3. WAJ INSPECTION CHAMBERS SHALL BE IN ACCORDANCE WITH WAVIN SPECIFICATION OR EQUIVALENT APPROVED.
4. ALL EXISTING DRAINAGE WORKS AFFECTING THE CONSTRUCTION SHALL BE CHECKED BY THE CONTRACTOR PRIOR TO ANY DRAINAGE WORKS TAKING PLACE AND ANY DISCREPANCIES SHALL BE NOTIFIED TO THE ENGINEER
5. A SITE INVESTIGATION SHALL BE CARRIED OUT ON SITE TO CONFIRM THE SITE GROUND CONDITIONS WHICH SHALL INCLUDE AN INFILTRATION TEST IN ACCORDANCE WITH BRE DIGEST 365 AT THE SITE OF EACH SOAKAWAY
6. THE SIZES OF THE PROPOSED SOAKAWAYS ARE PRELIMINARY ONLY AND ARE SUBJECT TO CHANGE BASED ON THE RECOMMENDATIONS OF THE SITE INVESTIGATION.
7. NO WORKS SHALL BE CARRIED OUT TO THE EXISTING STORM OR FOUL DRAINAGE SYSTEMS
8. THE SOAKAWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH BRE DIGEST 365 AND CONSIST OF SINGLE SIZE STONE SURROUNDED WITH A PERMEABLE GEOTEXTILE TO THE TOP AND ALL SIDES OF THE SOAKAWAY WITH A VERTICAL INSPECTION CHAMBER AND COVER AT EACH CHANGE IN DIRECTION. ALL PIPEWORK SHALL BE uPVC AND ALL PIPEWORK BELOW THE INVERT LEVEL SHALL BE PERFORATED
9. THE FORMATION LEVEL OF THE SOAKAWAY SHALL BE INSPECTED BY THE ENGINEER PRIOR TO BACKFILLING.

TYPICAL 'EXCLUSION ZONE' AND IMAPCT ON EXISTING SEWERS SECTION (X-X)

LEGEND

- DENOTES EXISTING SITE BOUNDARY
- DENOTES PROPOSED BUILDING
- DENOTES EXISTING COMBINED WATER MANHOLE
- DENOTES EXISTING STORM WATER MANHOLE
- DENOTES EXISTING ARMSTRONG JUNCTION
- DENOTES EXISTING COMBINED WATER SEWER
- DENOTES EXISTING STORM WATER SEWER
- DENOTES EXISTING FOUL WATER SEWER
- DENOTES EXISTING WATERMAIN
- DENOTES PROPOSED FOUL WATER MANHOLE
- DENOTES PROPOSED SURFACE WATER MANHOLE
- DENOTES PROPOSED FOUL WATER DRAINAGE
- DENOTES PROPOSED SURFACE WATER DRAINAGE
- DENOTES PROPOSED SOAKAWAY
- C.L DENOTES PROPOSED COVER LEVEL
- I.L DENOTES PROPOSED INVERT LEVEL
- SVP DENOTES PROPOSED SOIL AND VENT PIPE
- RSP DENOTES PROPOSED RAIN WATER PIPE

Notes:
For scaling purposes refer to Architect's drawings.
This drawing to be read in conjunction with all other Architectural and Engineering drawings and all other relevant drawings and specifications.
DO NOT SCALE THIS DRAWING. Figured dimensions only to be used in all cases.
Verify dimensions on site and report any discrepancies to the author immediately.

Rev	Dm	Chkd	Amendments	Date
-	-	-	-	-

Rev	Dm	Chkd	Amendments	Date

FOR PLANNING

Drawing Sheet Size: A3

Client: MARRAGH LYNCH ARCHITECTS
Project: NEW HOUSE AT 6A BODEN VILLAS, BALLYBODEN
Title: SITE DRAINAGE PLAN
Dwg No: IL021-TCE-00-GF-DR-C-0008 Revision: P01
Scale: 1:100 Date: 6.10.2021 Status:
Drn By: DJO Chkd By: AJL Apvd By: AJL

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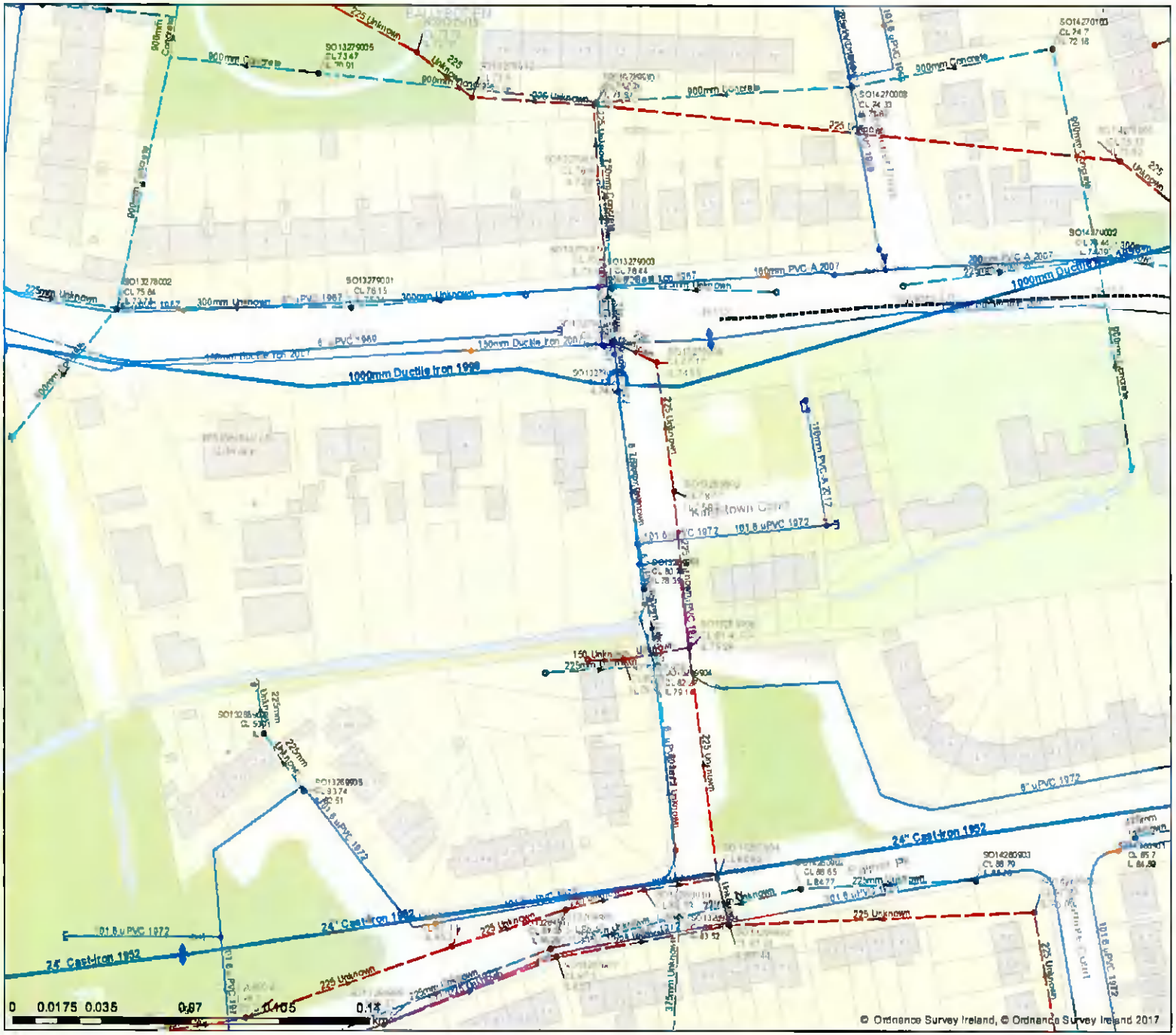
LA Public Sewer Records

Irish Water Web Map



UISCE ÉIREANN · IRISH WATER

Print Date: 20/11/2020

Printed by:Irish Water

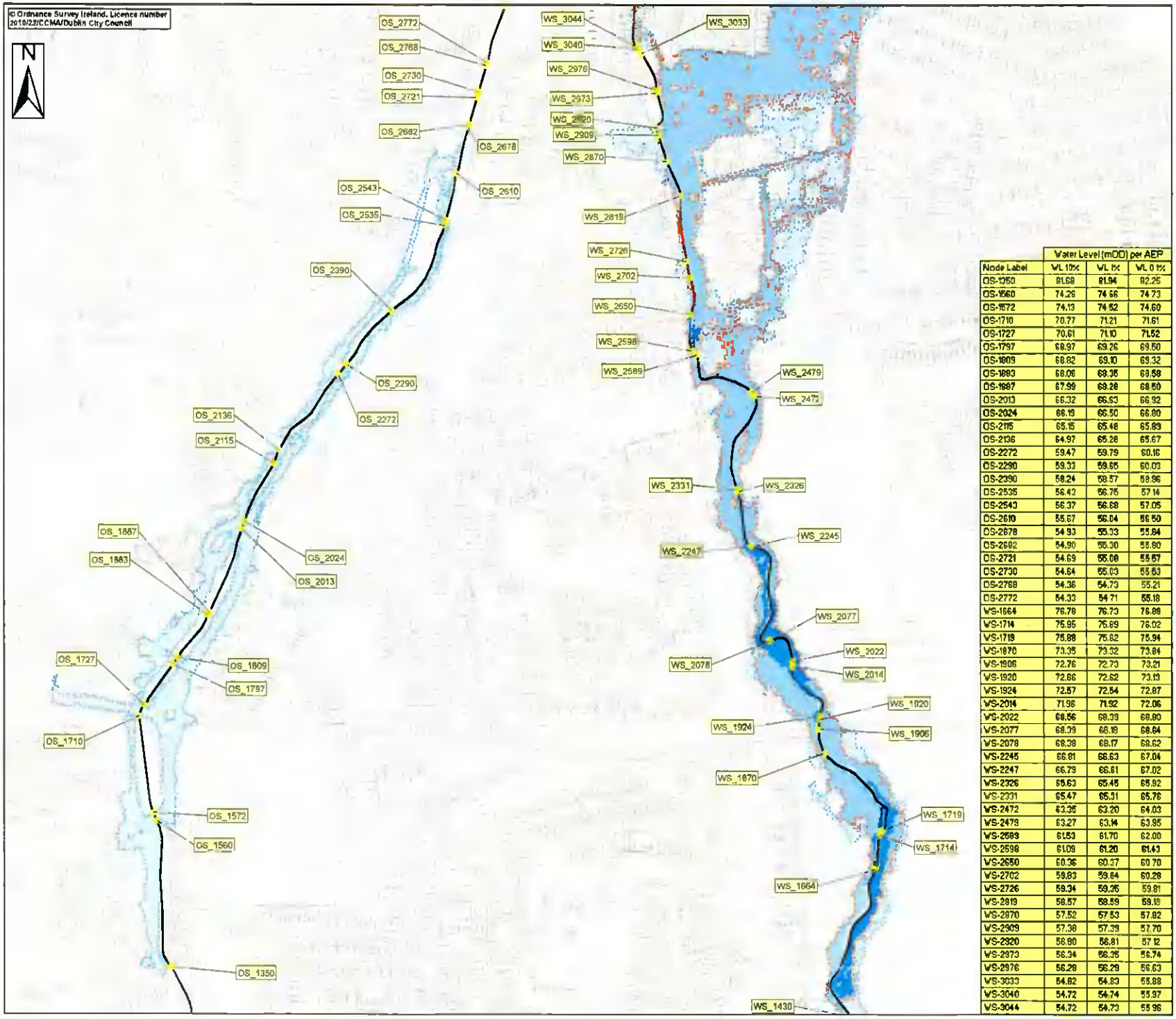
Water Distribution Network
Water Treatment Plant
Water Pump Station
Storage Cell/Tower
Dosing Point
Meter Station
Abstraction Point
Telemetry Kiosk
Reservoir
Potable
Raw Water
Water Distribution Mains
Irish Water
Private
Trunk Water Mains
Irish Water
Private
Water Lateral Lines
Irish Water
Non IW
Water Casings
Water Abandoned Lines
Boundary Meter
Bulk/Check Meter
Group Scheme
Source Meter
Waste Meter
Unknown Meter Other Meter
Non-Return
PRV
PSV
Sluice Line Valve Open/Closed
Butterfly Line Valve Open/Closed
Sluice Boundary Valve Open/Closed
Butterfly Boundary Valve Open/Closed
Scour Valves
Single Air Control Valve
Double Air Control Valve
Water Blot Valves
Water Service Connections
Water Distribution Chambers
Water Network Junctions
Pressure Monitoring Point
Fire Hydrant
Fire Hydrant/Washout
Water Fittings
Cap
Reducer
Tap
Other Fittings

Sewer Foul Combined Network
Waste Water Treatment Plant
Waste Water Pump station
Sewer Mains Irish Water
Gravity - Combined
Gravity - Foul
Gravity - Unknown
Pumping - Combined
Pumping - Foul
Pumping - Unknown
Syphon - Combined
Syphon - Foul
Overflow
Sewer Mains Private
Gravity - Combined
Gravity - Foul
Gravity - Unknown
Pumping - Combined
Pumping - Foul
Pumping - Unknown
Syphon - Combined
Syphon - Foul
Overflow
Sewer Lateral Lines
Sewer Casings
Sewer Manholes
Standard
Backdrop
Cascade
Casings
Bifurcation
Hatchbox
Lamphole
Hydrobrake
Other Unknown
Discharge Type
Outfall
Overflow
Soakaway
Storage Outlet
Other Unknown
Discharge Type
RE
Flushing Structure
Other Unknown
Sewer Inlets
Cascade
Gully
Standard
Other Unknown
Sewer Fittings
Vent/Col
Other Unknown

Storm Water Network
Surface Water Mains
Surface Gravity Mains
Surface Gravity Mains Private
Surface Water Pressurised Mains
Surface Water Pressurised Mains Private
Inlet Type
Gully
Standard
Other Unknown
Storm Manholes
Standard
Backdrop
Cascade
Catchpit
Bifurcation
Hatchbox
Lamphole
Hydrobrake
Other Unknown
Storm Culverts
Storm Clean Outs
Stormwater Chambers
Discharge Type
Outfall
Overflow
Soakaway
Other Unknown
Gas Networks Ireland
Trans Region High Pressure Gasline
Distribution Medium Pressure Gasline
Distribution Low Pressure Gasline
ESB Networks
ESB HV Lines
HV Underground
HV Overhead
HV Abandoned
ESB MV/LV Lines
MV Overhead Three Phase
MV Overhead Single Phase
LV Overhead Three Phase
LV Overhead Single Phase
MV/LV Underground
Abandoned
Non Service Categories
Proposed
Under Construction
Out of Service
Decommissioned
Water Non Service Assets
Water Point Feature
Water Pipe
Water Structure
Waste Non Service Assets
Waste Point Feature
Sewer
Waste Structure

Predicted flood maps

Appendix C:: Predicted Flood Data



Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
OS-1950	91.69	91.94	92.25
OS-1560	74.26	74.56	74.73
OS-1572	74.13	74.52	74.60
OS-1710	70.77	71.21	71.61
OS-1727	70.61	71.10	71.52
OS-1797	68.97	69.26	69.50
OS-1809	68.82	69.10	69.32
OS-1883	68.06	68.35	68.58
OS-1887	67.99	68.26	68.50
OS-2013	66.32	66.63	66.92
OS-2024	66.19	66.50	66.80
OS-2115	65.15	65.48	65.83
OS-2136	64.97	65.28	65.67
OS-2272	59.47	59.79	60.16
OS-2290	59.33	59.65	60.03
OS-2390	58.24	58.57	58.96
OS-2535	56.42	56.75	57.14
OS-2543	56.37	56.68	57.05
OS-2610	55.67	56.04	56.50
OS-2678	54.93	55.33	55.84
OS-2682	54.90	55.30	55.80
OS-2721	54.69	55.09	55.67
OS-2730	54.64	55.03	55.63
OS-2768	54.36	54.73	55.21
OS-2772	54.33	54.71	55.18
WS-1664	76.78	76.73	76.89
WS-1714	75.95	75.89	76.02
WS-1719	75.88	75.82	75.94
WS-1870	73.35	73.32	73.84
WS-1906	72.76	72.73	73.21
WS-1920	72.66	72.62	73.13
WS-1924	72.57	72.54	72.87
WS-2014	71.96	71.92	72.06
WS-2022	69.56	69.39	69.80
WS-2077	68.39	68.16	68.64
WS-2078	68.39	68.17	68.62
WS-2245	66.81	66.63	67.04
WS-2247	66.79	66.61	67.02
WS-2326	65.63	65.45	65.92
WS-2331	65.47	65.31	65.76
WS-2472	63.35	63.20	64.03
WS-2479	63.27	63.14	63.95
WS-2589	61.53	61.70	62.00
WS-2598	61.09	61.20	61.43
WS-2650	60.36	60.37	60.70
WS-2702	59.83	59.64	60.28
WS-2726	59.34	59.36	59.81
WS-2819	58.57	58.59	59.19
WS-2870	57.52	57.53	57.82
WS-2909	57.38	57.39	57.70
WS-2920	56.80	56.81	57.12
WS-2973	56.34	56.35	56.74
WS-2976	56.28	56.29	56.63
WS-3033	54.82	54.83	55.88
WS-3040	54.72	54.74	55.97
WS-3044	54.72	54.73	55.96

Location Plan

Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.20, 1% Flow = 1.66, 0.1% Flow = 2.17 Peak flow during design flood event

USER NOTE

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client

South Dublin County Council

OPW

Project

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map

PRESENT DAY OWENDOHER & WHITECHURCH

Map Type: FLOOD EXTENT

Source: FLUVIAL FLOODING

Map Area: URBAN AREA

Scenario: CURRENT

Drawn By	A.A.B	Date	24 November 2010
Checked By	A.J	Date	26 November 2010
Approved By	A.G.S	Date	26 November 2010

Figure No.

OSWS/EXT/UA/CURS/103

Map Series : Page 2 of 3

Drawing Scale 1: 8,000 Plot Scale 1:1 @ A3

0 0.1 0.2 Kilometers

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