

## 8.0 TIDAL FLOODING

A review of the OPW tidal flood hazard maps developed as part of the CFRAM initiative indicates that the subject site is located outside the predicted 1-in-1000-year flood event extents. In addition, the OPW undertook further modelling to establish the range of risk associated with tidal flooding due to the potential effects of climate change. This modelling looked at two scenarios: mid-range (an increase in sea levels by 0.5m) and high-end (an increase in sea levels by 1.0m). Due to the subject site's location and elevation, it would not be affected by the future high-end scenario. The proposed development has a finished floor level at lower ground floor of 4.2mAOD (this being the lowest occupied level) and the predicted 1-in-1000-year tidal flood level in the River Liffey has been calculated at 3.48mAOD. See **Appendix E** for the relevant CFRAM map of predicted tidal flooding extents, an extract of which is shown in **Figure 9**.

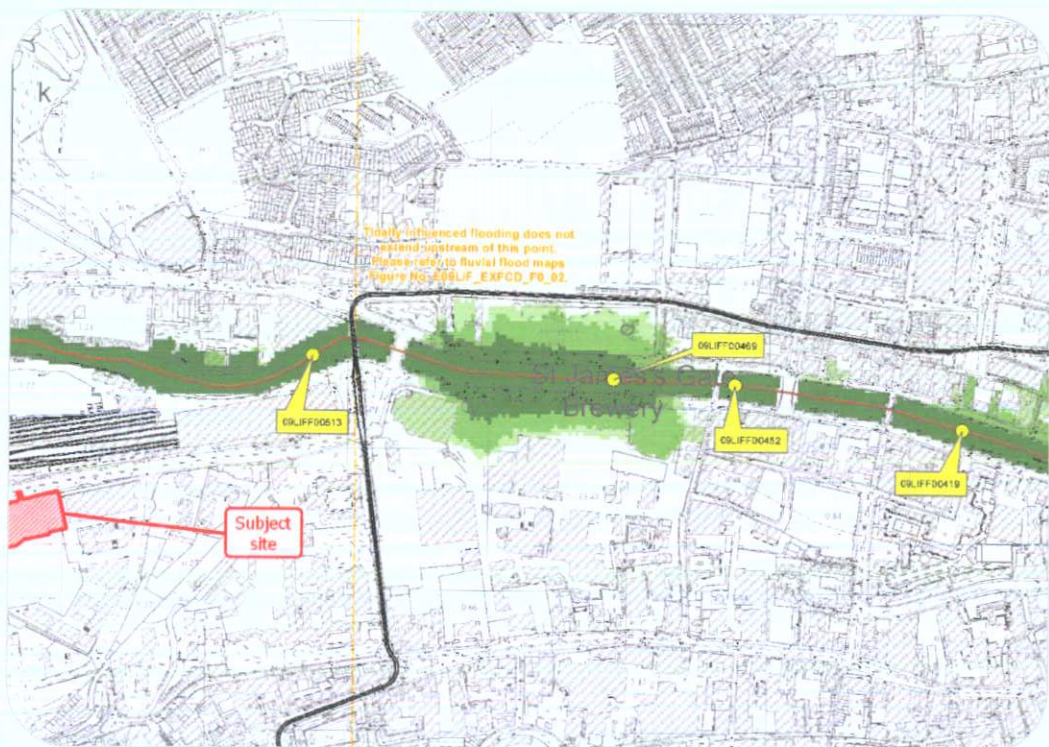


Figure 9 – Extract of CFRAM tidal flood extents mapping  
(background imagery source: OPW)

## 9.0 GROUNDWATER FLOODING

A review of the Geological Survey of Ireland database ([www.gsi.ie](http://www.gsi.ie)) gives background data on the site's geology and hydrogeological properties. The site is underlain with dark limestone and shale, and forms part of the Lucan Formation. The GSI classifies the regional aquifer as *locally important* and *moderately productive* with a vulnerability classification of *low*.

The site's elevation and the lack of karst features indicate that the potential for the subject lands to be flooded due to groundwater features is low and deemed insignificant. This view is further supported by the knowledge that the site has had an existing basement in place for over a decade. As no significant alteration is proposed to this basement, flooding which may have been generated during basement excavation works shall not occur.

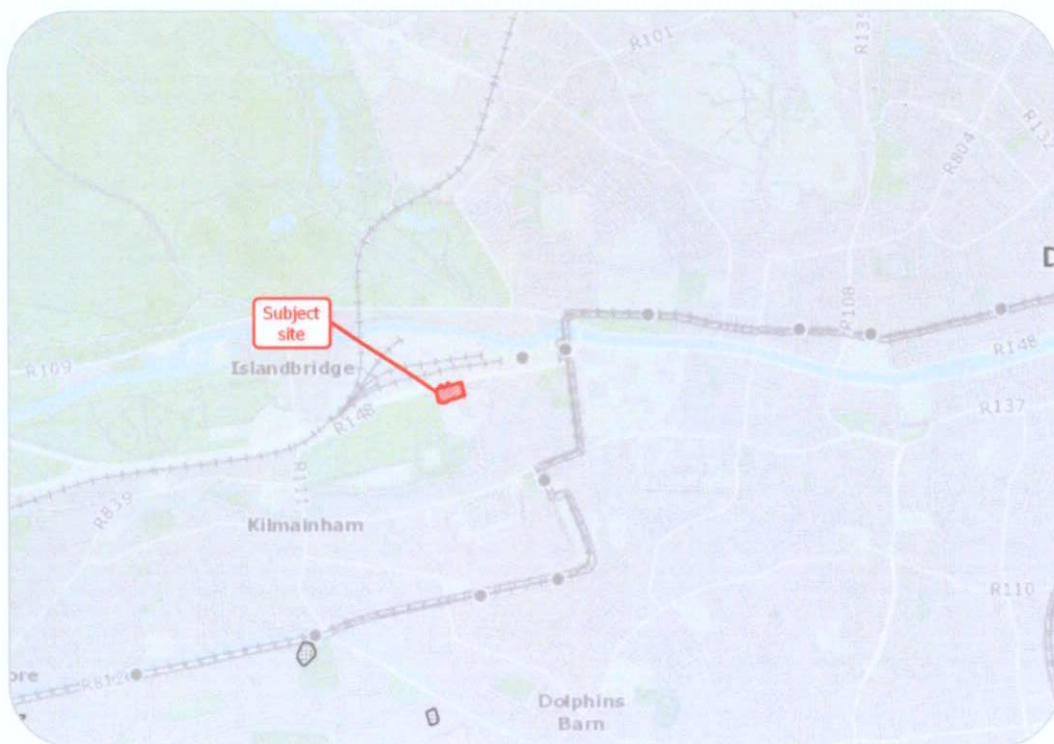


Figure 10 – Extract of GSI geology mapping  
(background imagery source: GSI)

See **Appendix F** for GSI Geological and Hydrogeological maps. Extracts of these maps – showing the subject site location – are given in **Figure 10** and **Figure 11**.

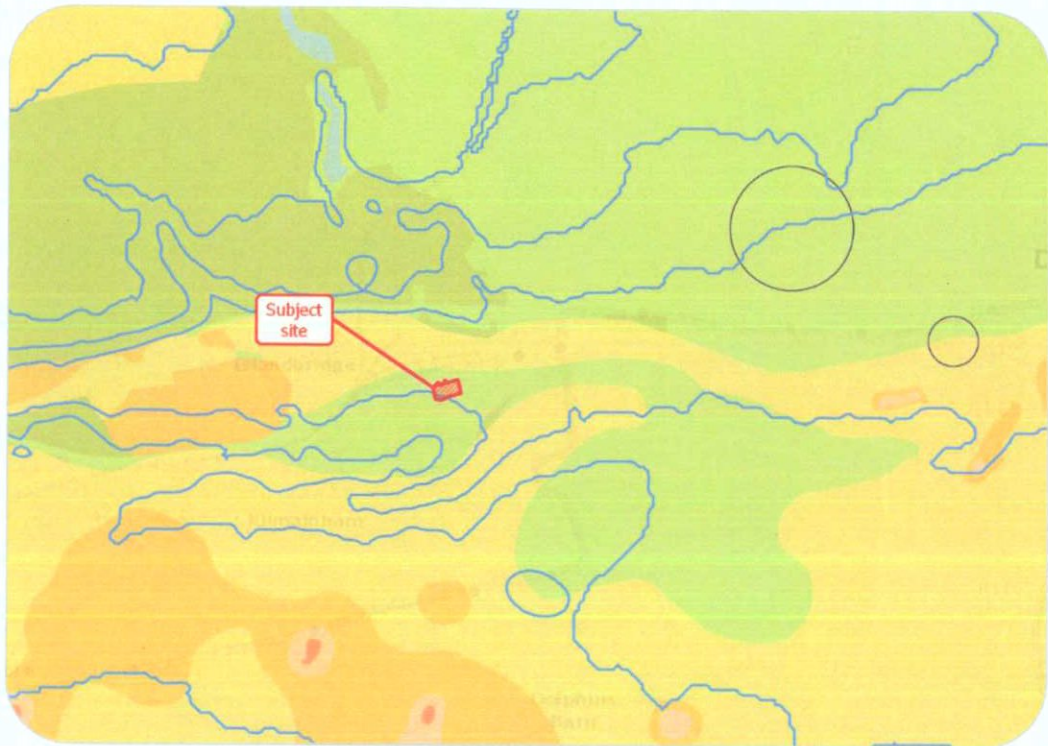


Figure 11 – Extract of GSI hydrogeology mapping  
(background imagery source: GSI)

## 10.0 INFRASTRUCTURE FLOODING

As part of Dublin City Council's survey of the drainage network of Dublin, the Greater Dublin Strategic Drainage Study (GDSDS), a review of the drainage assets in Dublin was carried out. From the survey, hydraulic performance mapping was developed to give an indication of the current and predicted hydraulic performance of sewers up to 2031. The GDSDS was published in 2005 and alterations to the local drainage arrangements have taken place since its publication. The GDSDS map encompassing the subject site indicates that the sewers to the south, located along Kilmainham Lane, a 275mm combined sewer does not surcharge for 1- or 2-year return period events. There are no drainage utilities located to the east of the subject lands along Military Road. To the north of the subject site, surcharging is noted in the existing 375mm storm sewer and the 1060 x 630 culvert combined sewers.

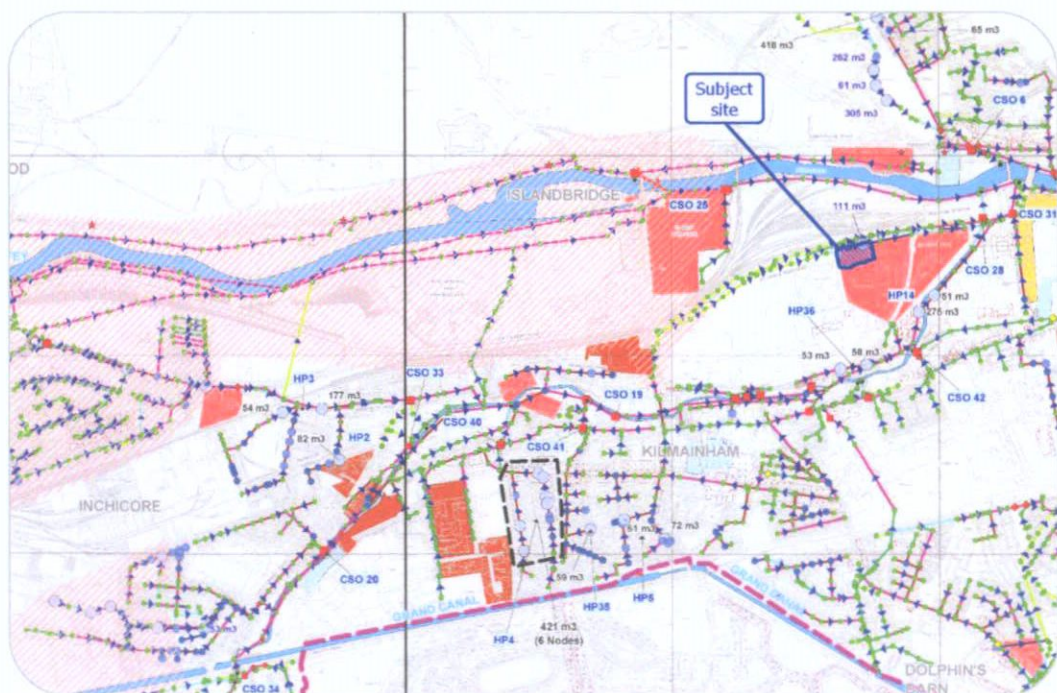


Figure 12 – Extract of 2031 system performance assessment map  
(background imagery source: Dublin Drainage)

The proposed stormwater outfall will not connect into these lines as modelled by the GDSDS. Since the GDSDS, a new storm water sewer has been laid along St. John's Road West, into which the proposed developments restricted storm water flow will discharge. This will ensure that local drainage infrastructure will not flood or adversely affect the site. See **Appendix G** for the relevant GDSDS Hydraulic Performance Map, an extract of which is shown in **Figure 12**.



## 11.0 POTENTIAL FOR SITE TO CONTRIBUTE TO OFF-SITE FLOODING

The site is currently partially developed but does not have any attenuation systems in place. As such the proposed redevelopment of the site will require attenuation to be provided. The attenuation tank will be sized for a 1-in-100-year storm event and will release the storm water in a controlled manner after the peak storm duration has passed. By restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated.

It is the understanding of CS Consulting that at present there are no issues with the local drainage arrangements. This opinion was reached by a review of the historic flooding for the area and the knowledge that the proposed development will drain an attenuated storm water flow into a dedicated storm water sewer. By discharging an attenuated flow for all extreme storm events into the public sewer the restricted flow will help prevent the storm water network from surcharging during a high intensity event.

## 12.0 CONCLUSIONS

The Site-Specific Flood Risk Assessment was carried out in accordance with the requirements of the national flood guidelines and with those of Dublin City Council's Development Plan.

- The subject lands have no historical evidence of onsite flooding, based on historical records from the OPW.
- A review of Dublin City Council's Development Plan indicates that the subject site is located in Flood Zone 'C' and that a justification test is consequently not required for development at this location.
- CFRAM fluvial flood hazard maps produced by the OPW do not show the site to be vulnerable to flooding from either the River Liffey or the River Camac. Therefore, the risk due to fluvial flooding is considered to be negligible.
- Dublin City Council's pluvial flood mapping does not indicate that the subject lands are located in an area subject to pluvial flooding. Therefore, the risk due to pluvial flooding is considered to be negligible.
- As the subject site is located close to the tidally influenced River Liffey, a review of this potential flood pathway was undertaken. Mapping provided by the OPW does not indicate that the site would be affected by tidal flood events. Therefore, the risk due to tidal flooding is considered to be negligible.
- The potential for infrastructure failure either from offsite or from within the proposed development's storm water drainage systems was assessed. Given the site's elevation above the public road network and the development's use of a stormwater attenuation system to restrict storm water flows exiting the site, it is considered that the potential for flooding either on/off site due to infrastructure failure is remote.



- A review of groundwater flooding sources for the subject site did not establish a potential route for groundwater flooding. The proposed development is to complement/complete a previous development and there is no requirement for a basement to be installed, as one was previously constructed. A review of the GSI database does not indicate that the site has experienced flooding from past events, nor does it predict groundwater flooding in the future. As such, the potential for groundwater flooding is deemed to be negligible.

The proposed development is deemed to be suitable for the site location, as historical and potential flood routes have been reviewed and the likelihood of the development being subject to flooding is remote.





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## Appendix A

### **OPW Historic Flood Mapping**

# Past Flood Event Local Area Summary Report

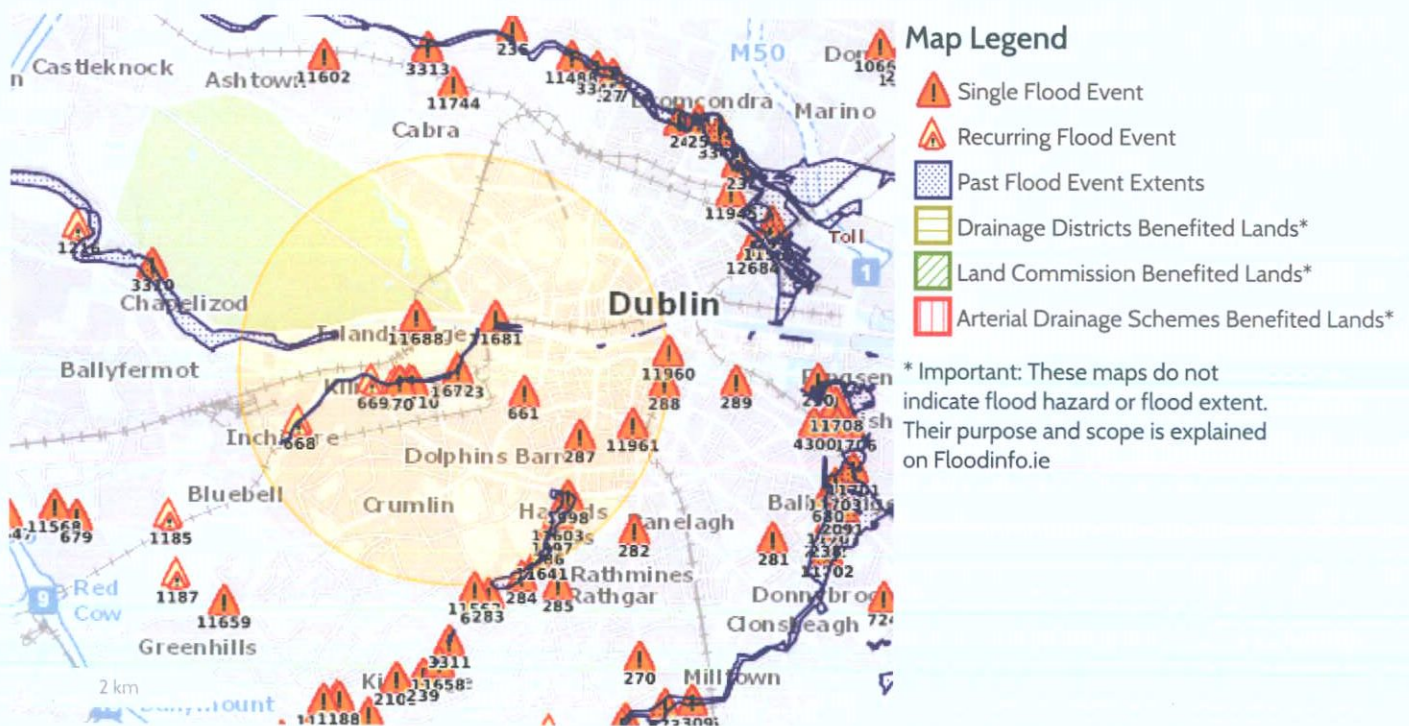


**OPW** Óifig na nOibreacha Poiblí  
Office of Public Works

Report Produced: 17/12/2020 12:31

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.


This report has been downloaded from [www.floodinfo.ie](http://www.floodinfo.ie) (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



## 24 Results

Name (Flood_ID)	Start Date	Event Location
1.  Flooding on Wexford St, Dublin 2 on 26th July 2013 (ID-11961) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	26/07/2013	Approximate Point
2.  Poddle August 1986 (ID-32) Additional Information: <a href="#">Reports (9)</a> <a href="#">Press Archive (1)</a>	25/08/1986	Area
3.  Dublin City Tidal Feb 2002 (ID-456) Additional Information: <a href="#">Reports (45)</a> <a href="#">Press Archive (27)</a>	01/02/2002	Area
4.  Mount Jerome Harold's Cross June 1963 (ID-286) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point
5.  Clanbrassil Street June 1963 (ID-287) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point
6.  Grafton Street June 1963 (ID-288) Additional Information: <a href="#">Reports (4)</a> <a href="#">Press Archive (2)</a>	11/06/1963	Exact Point

Name (Flood_ID)	Start Date	Event Location
7.  Camac Turvey Ave Recurring (ID-669) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Poir
8.  Poddle Tributary Marrowbone Lane Jan 1941 (ID-661) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	21/01/1941	Approximate Point
9.  Camac Goldenbridge Recurring (ID-668) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
10.  Camac Carrickfoyle Terrace Recurring (ID-670) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
11.  Camac Kearns Place Recurring (ID-671) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Exact Point
12.  Camac Bow Bridge Recurring (ID-672) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	n/a	Approximate Point
13.  Poddle St Claires Ave Sept 1931 (ID-1997) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	03/09/1931	Approximate Point
14.  Poddle Limekiln Lane Aug 1905 (ID-1998) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/08/1905	Approximate Point
15.  Poddle Limekiln Lane Sept 1931 (ID-3267) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	03/09/1931	Approximate Point
16.  Liffey Lower - Dec 1954 (ID-241) Additional Information: <a href="#">Reports (5)</a> <a href="#">Press Archive (2)</a>	08/12/1954	Area
17.  Camac August 1986 (ID-125) Additional Information: <a href="#">Reports (3)</a> <a href="#">Press Archive (0)</a>	25/08/1986	Area
18.  Flooding at Bow Lane, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11563) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
19.  Flooding at Harold's Cross, Dublin City on 24th Oct 2011 (ID-11603) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
20.  Flooding at Kearns Place, Kilmainham, Dublin 8 on 24th Oct 2011 (ID-11620) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
21.  Flooding at Lady's Lane, Kilmainham, Co. Dublin on 24th Oct 2011 (ID-11622) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Approximate Point
22.  Flooding at Mount Argus Road and Kimmage Road Lower on 24th Oct 2011 (ID-11641) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Exact Point
23.  Flooding at Ashling Hotel, Parkgate Street, Dublin 8 on 24th Oct 2011 (ID-11681) Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>	24/10/2011	Exact Point

	Name (Flood_ID)	Start Date	Event Location
24.		Flooding at Bridgewater Quay Apartments, Islandbridge, Dublin 8. on 24th Oct 2011 (ID-11688)	24/10/2011 Exact Point
Additional Information: <a href="#">Reports (1)</a> <a href="#">Press Archive (0)</a>			

DCC PLAN NO: 4610/22  
RECEIVED: 04/08/2022



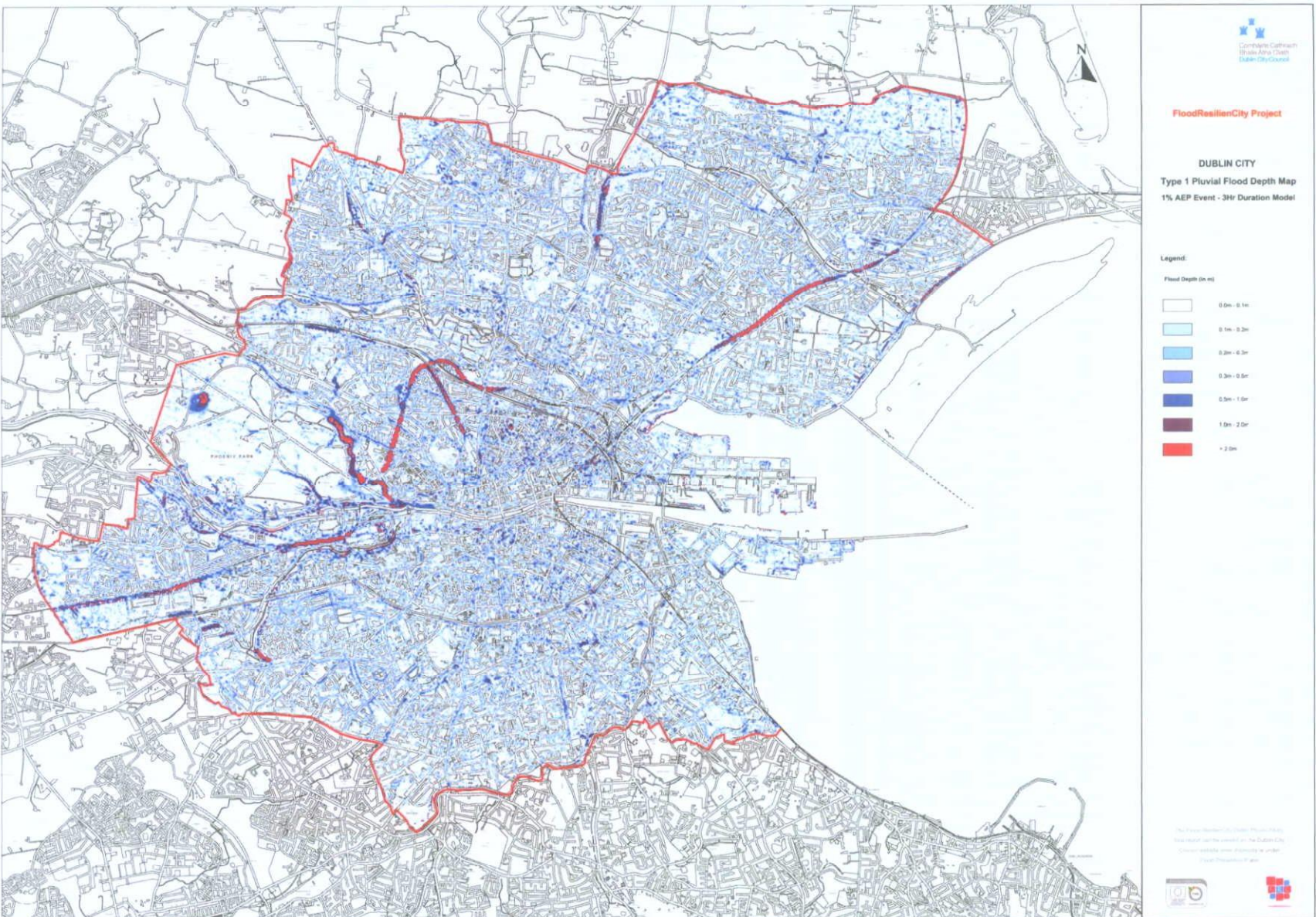
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## Appendix B

### Dublin City Council Flood Zoning









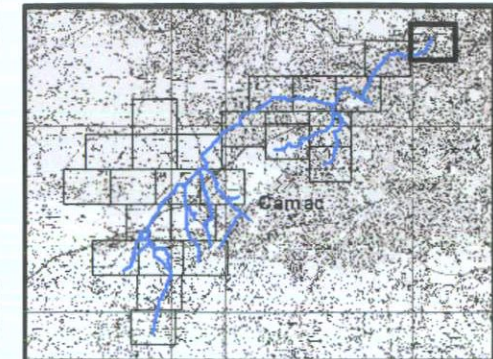
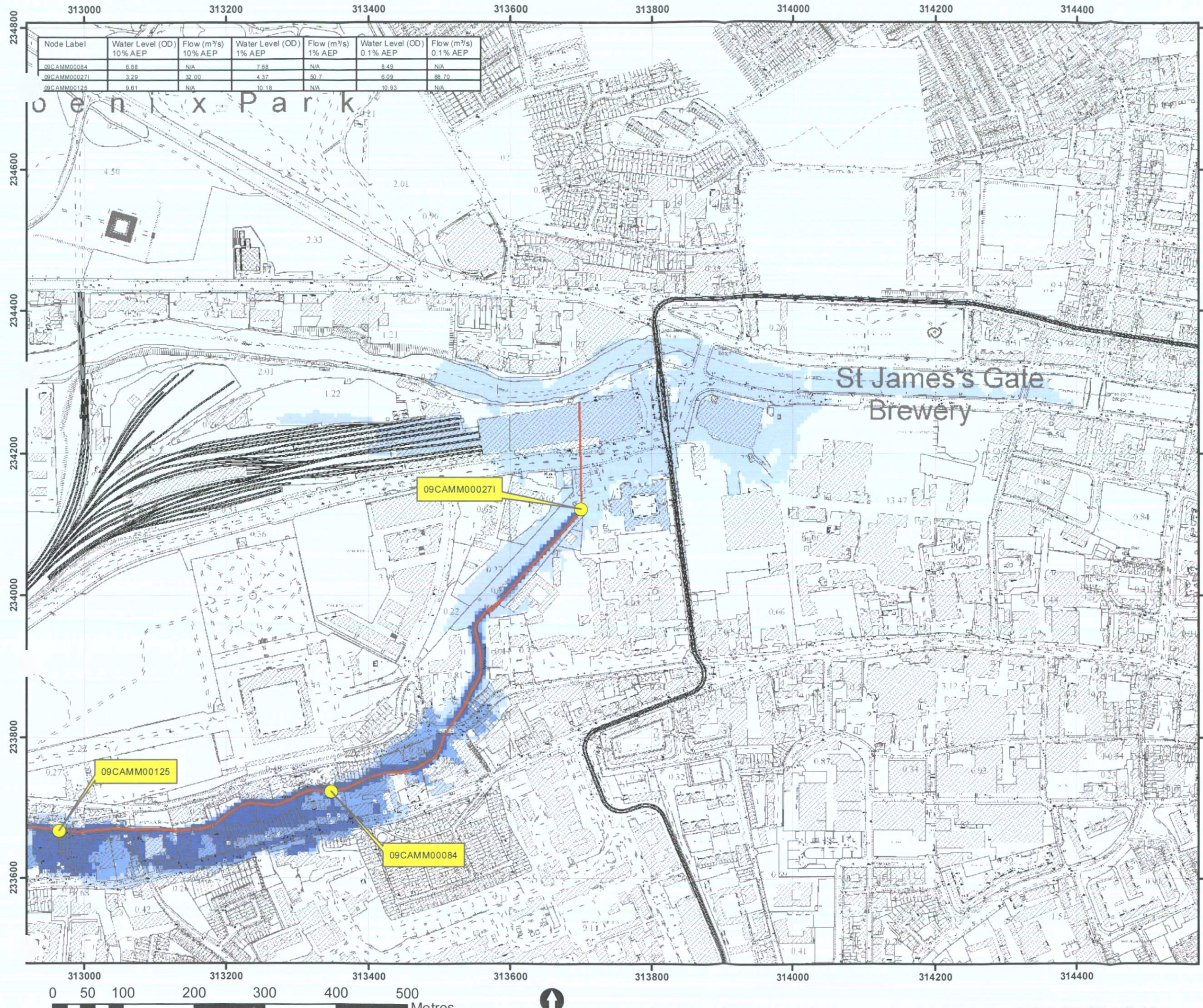


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## Appendix C

### **OPW Fluvial Flood Mapping**




**IMPORTANT USER NOTE:**  
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

- Legend**
- █ 10% Fluvial AEP Event
  - █ 1% Fluvial AEP Event
  - █ 0.1% Fluvial AEP Event
  - Modelled River Centreline
  - AFA Extents
  - Embankment
  - Wall
  - Defended Area
  - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - 0.1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - Node Point
  - Node ID


**FINAL**

REV: 01	NOTE: SOP label updated (Pg 21) Removal of Def. Area (Pg 21)	DATE: 13/11/2017
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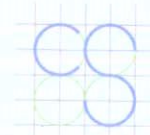


The Office of Public Works  
Jonathan Swift Street  
Trim  
Co Meath



Elmwood House  
74 Boucher Road  
Belfast  
BT12 6RZ  
E ireland@rpsgroup.com

<b>Map:</b>	
Camac Fluvial Flood Extents	
Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By:	C.McG. Date: 13 November 2017
Checked By:	A.S. Date: 13 November 2017
Approved By:	S.P. Date: 13 November 2017
Drawing No.:	E09CAM_EXFCD_F1_24
Map Series:	Page 24 of 24
Drawing Scale:	1:5,000 @A3



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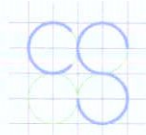
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## Appendix D

### **Pluvial Flooding Maps**





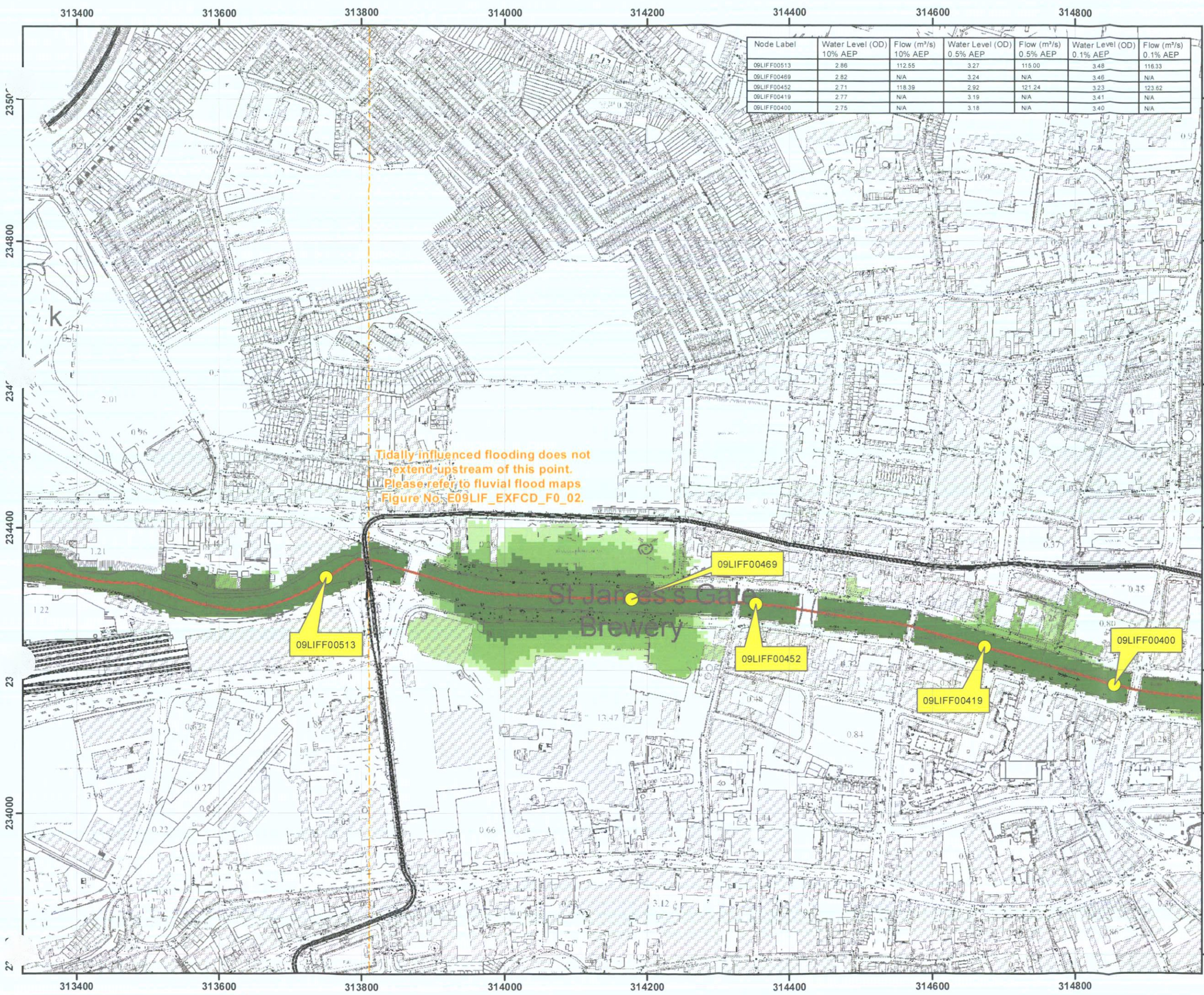


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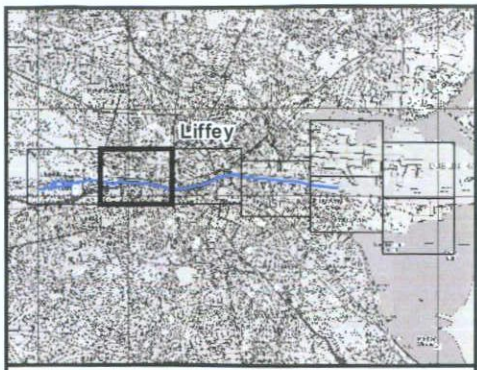
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## Appendix E

### **OPW Tidal Flood Maps**



Node Label	Water Level (OD)		Flow (m <sup>3</sup> /s)		Water Level (OD)		Flow (m <sup>3</sup> /s)	
	10% AEP	10% AEP	10% AEP	10% AEP	0.5% AEP	0.5% AEP	0.1% AEP	0.1% AEP
09LIFF00513	2.86	112.55	3.27	115.00	3.48	116.33	N/A	N/A
09LIF00469	2.82	N/A	3.24	N/A	3.46	N/A	N/A	N/A
09LIF00452	2.71	118.39	2.92	121.24	3.23	123.82	N/A	N/A
09LIF00419	2.77	N/A	3.19	N/A	3.41	N/A	N/A	N/A
09LIF00400	2.75	N/A	3.18	N/A	3.40	N/A	N/A	N/A



**IMPORTANT USER NOTE:**  
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

- Legend**
- 10% Tidal AEP Event
  - 0.5% Tidal AEP Event
  - 0.1% Tidal AEP Event
  - Modelled River Centreline
  - AFA Extents
  - Node Point
  - Node ID Node Label


Tidally-influenced flooding does not extend upstream of this point. Please refer to fluvial flood maps Figure No. E09LIF\_EXFCD\_F0\_02.

St James's Gate Brewery


**FINAL**

REV:	NOTE:	DATE:
01	Amendments to Flood Extents.	05/12/16





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Jonathan Swift Street  
Trim  
Co Meath

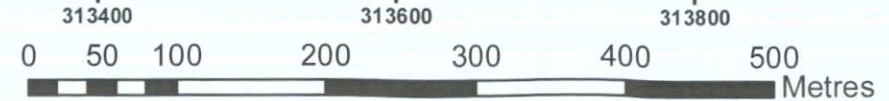


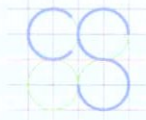
Elmwood House T +44(0) 28 90 667914  
74 Boucher Road F +44(0) 28 90 668286  
Belfast W www.rpsgroup.com  
BT 12 6RZ E ireland@rpsgroup.com

**Map:**

Liffey Tidal Flood Extents
Map Type: EXTENT
Source: TIDAL
Map Area: COASTAL
Scenario: CURRENT
Drawn By : C.C. Date : 9 May 2017
Checked By : A.S. Date : 9 May 2017
Approved By : S.P. Date : 9 May 2017
Drawing No. : E09LIF_EXCCD_F1_02

Map Series : Page 2 of 8  
Drawing Scale : 1:5,000 @ A3





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## Appendix F

### **GSI Geology & Hydrogeological Maps**





## Legend

### EPA CONTOUR 20m

— 0- 100m

### Groundwater Wells and Springs

□ Groundwater Wells and Springs

### Bedrock Aquifer

LI - Locally Important Aquifer - Bedrock  
which is Moderately Productive only in  
Local Zones

### Groundwater Vulnerability

X - Rock at or near surface or Karst

E - Extreme

H - High

M - Moderate

L - Low

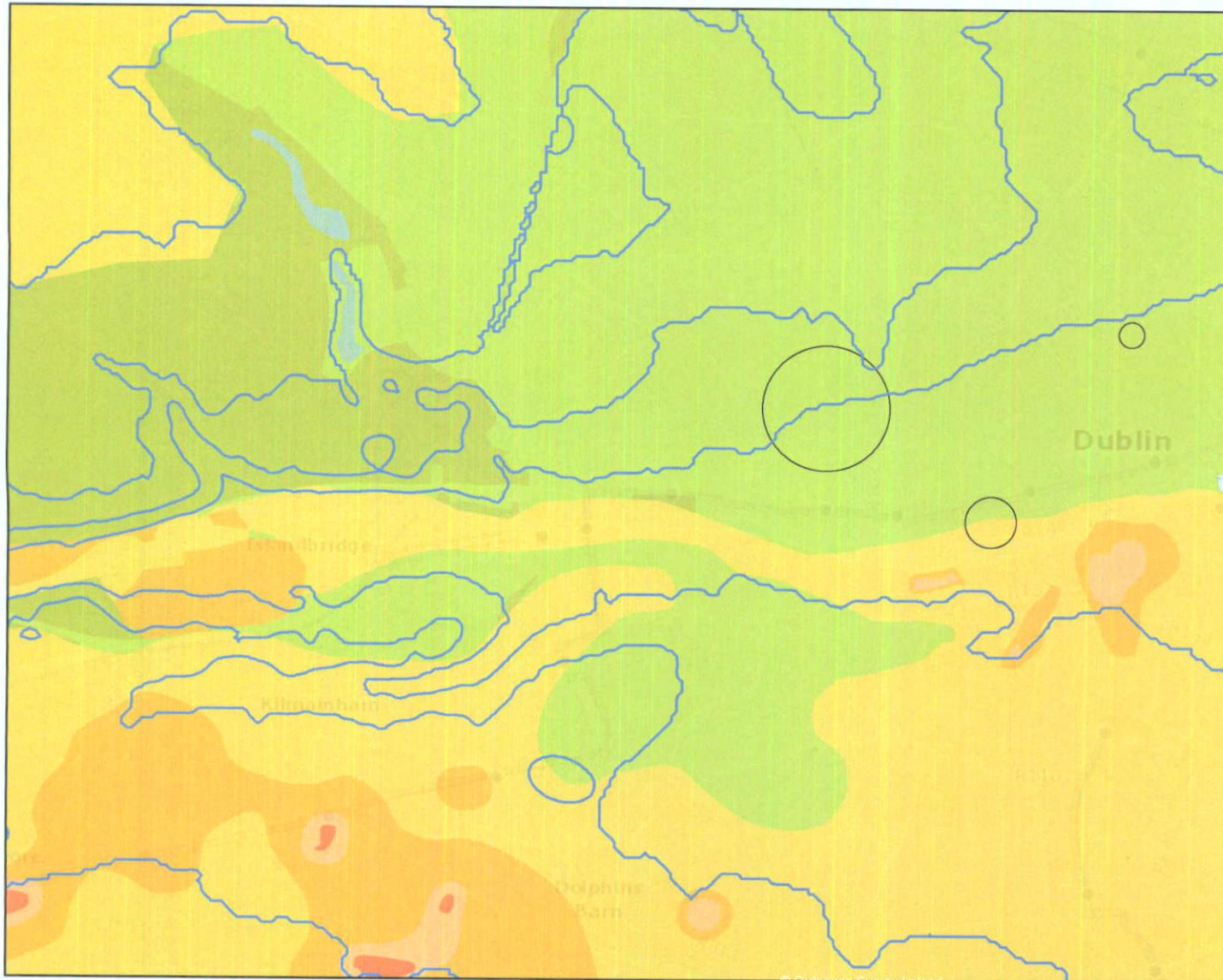
### Groundwater Recharge (mm/yr)

1-50 mm

51-100 mm

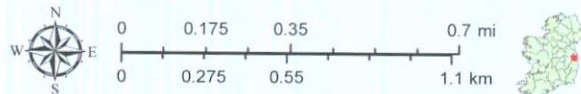
151-200 mm

Water



Scale: 1:25,000


**Geological Survey Ireland**



Map Centre Coordinates (ITM) 713,879 734,429  
22/02/2019, 10:03:22

Ordnance Survey Ireland Licence No. EN 0047217  
© Ordnance Survey Ireland/Government of Ireland  
© Geological Survey Ireland/Government of Ireland

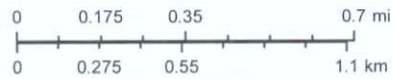
**Legend**

- Bedrock Outcrop
-  Bedrock Outcrop
- Bedrock Rock Units
- Lucan Formation



Scale: 1:25,000

**Geological Survey Ireland**



Map Centre Coordinates (ITM) 713,879 734,591  
22/02/2019, 10:07:09

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 © Ordnance Survey Ireland/Government of Ireland  
 © Geological Survey Ireland/Government of Ireland

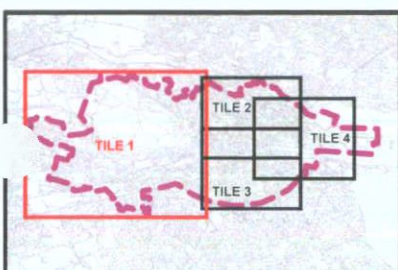
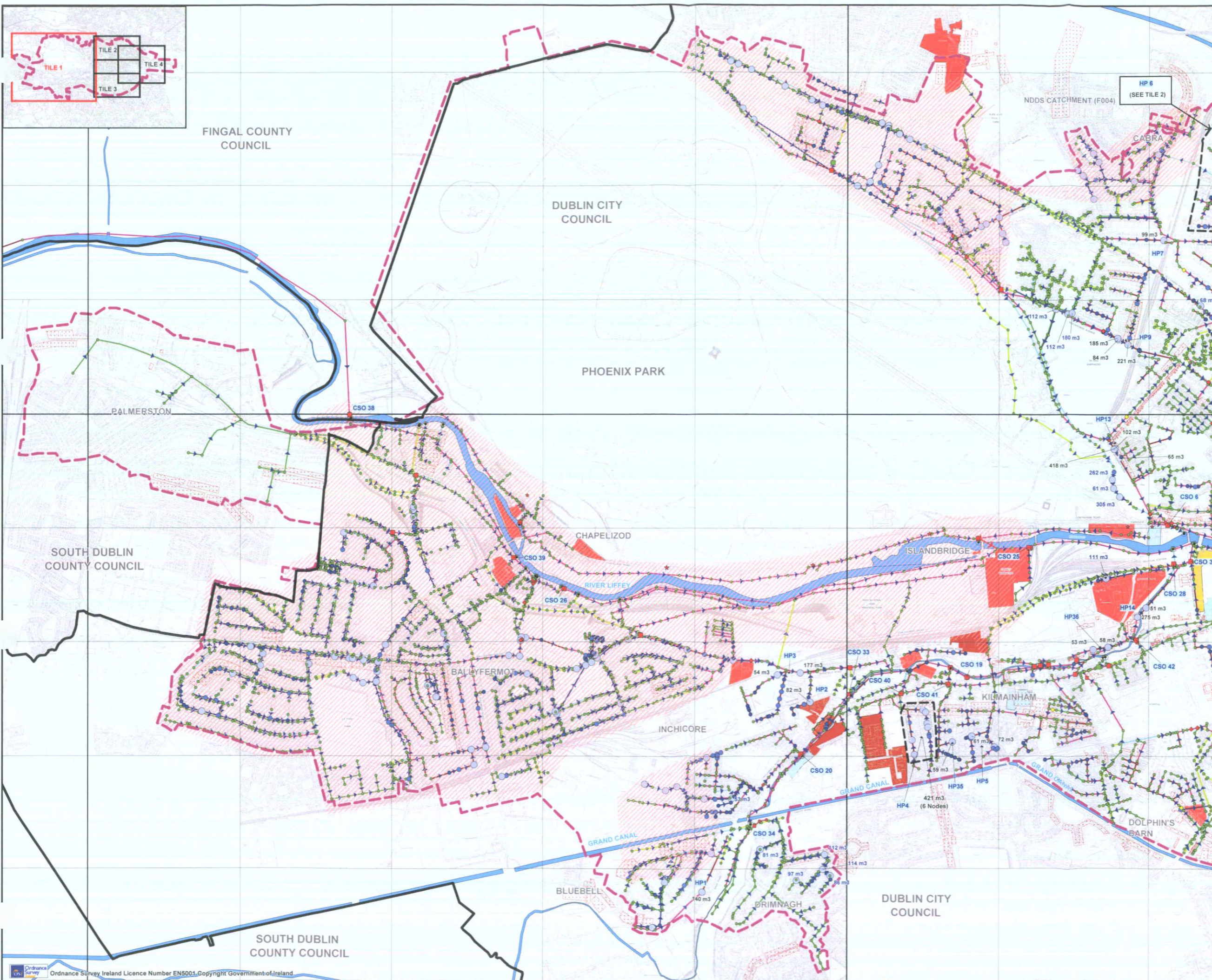


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## Appendix G

### **Greater Dublin Strategic Drainage Study Mapping**



**Legend**

- Wastewater Treatment Works
- County Council Boundaries
- Catchment Boundary
- Rising Main (Coloured as sewer)
- Sewer not included in hydraulic model
- Direction of Flow (on sewer line)
- River/Watercourse
- Culverted River/Watercourse
- 1:1000 OS Grid Line Boundaries
- 1:5000 OS Grid Line Boundaries
- Combined Sewer Overflow
- Foul/Combined Pumping Station
- Foul/Combined Bifurcation
- Foul/Combined Apex Manhole
- Foul/Combined Flow Management Chamber
- Storm Water Overflow to Foul/Combined
- Storm Water Bifurcation
- Storm Water Apex Manhole

**Flooding Performance Key**

- Flooding greater than 50m<sup>3</sup> Volume for 5yr Return Period Event (Volume m<sup>3</sup>)
- Flooding between 25m<sup>3</sup> and 50m<sup>3</sup> Volume for 5yr Return Period Event
- Flooding less than 25m<sup>3</sup> Volume for 5yr Return Period Event
- Modelled Manhole does not flood for 5 year Return Period Event

75m<sup>3</sup> 1.5 year Foul/Combined flood volume  
75m<sup>3</sup> 1.5 year Storm flood volume

- Historically Reported Flooding Incidents caused by Hydraulic Overloading
- Outfall

**Foul/Combined Hydraulic Performance Key**

- Foul/Combined Sewer floods for 30 year return period or less.
- Foul/Combined Sewer surcharges for 1 or 2 year return period events
- Foul/Combined Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)

**Storm Hydraulic Performance Key**

- Storm Sewer floods for 30 year return period or less.
- Storm Sewer surcharges for 1 or 2 year return period events
- Storm Sewer does not surcharge for 1 or 2 year return period events and does not flood for a 30 year return period event or below. (eg 1,2,5,10,20)

**Area Covered by EDS/DCC Asset Survey**

**Important Hydraulic Considerations**

- Location of Known Basements
- Zoned Residential Land
- Zoned Science/Technology Parks/Land
- Zoned Industrial Land
- Zoned Commercial Land
- Zoned Land for Mixed Development
- Recently Completed Developments

**Catchment Deficiency Reference Key**

- HP 1 Hydraulic Deficiency Reference No (Foul/Combined) (Not included for EDS/DCC Asset Survey area).
- CSO 1 CSO Deficiency Reference No. (Hydraulic or Environmental)
- OP 1 Operational Deficiency Reference No.

**Notes**

- Results are based on assessment of sewer system under 1, 2, 5, 10, 20, 30, 50 and 100 year return period rainfall events.
- For colour coding, flooding takes priority over surcharging.
- Levels referenced in meters to Ordnance Survey Datum, which is Mean Sea Level at Malin Head, Co. Donegal (1970 Adjustment).

**GREATER DUBLIN STRATEGIC DRAINAGE STUDY**

**CITY CENTRE/DOCKLANDS CATCHMENT**

**PHASE 3 - 2031 System Performance Assessment**

**GDS/MS/MAR3079/F001/P3-003\_Tile1**

Author	JGA	Check	MCB
Designer	MCB	Reviewer	N.T.S.
Date	7/5/04	Scale	A

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Dublin Drainage  
Ireland's Water & Sewerage Authority



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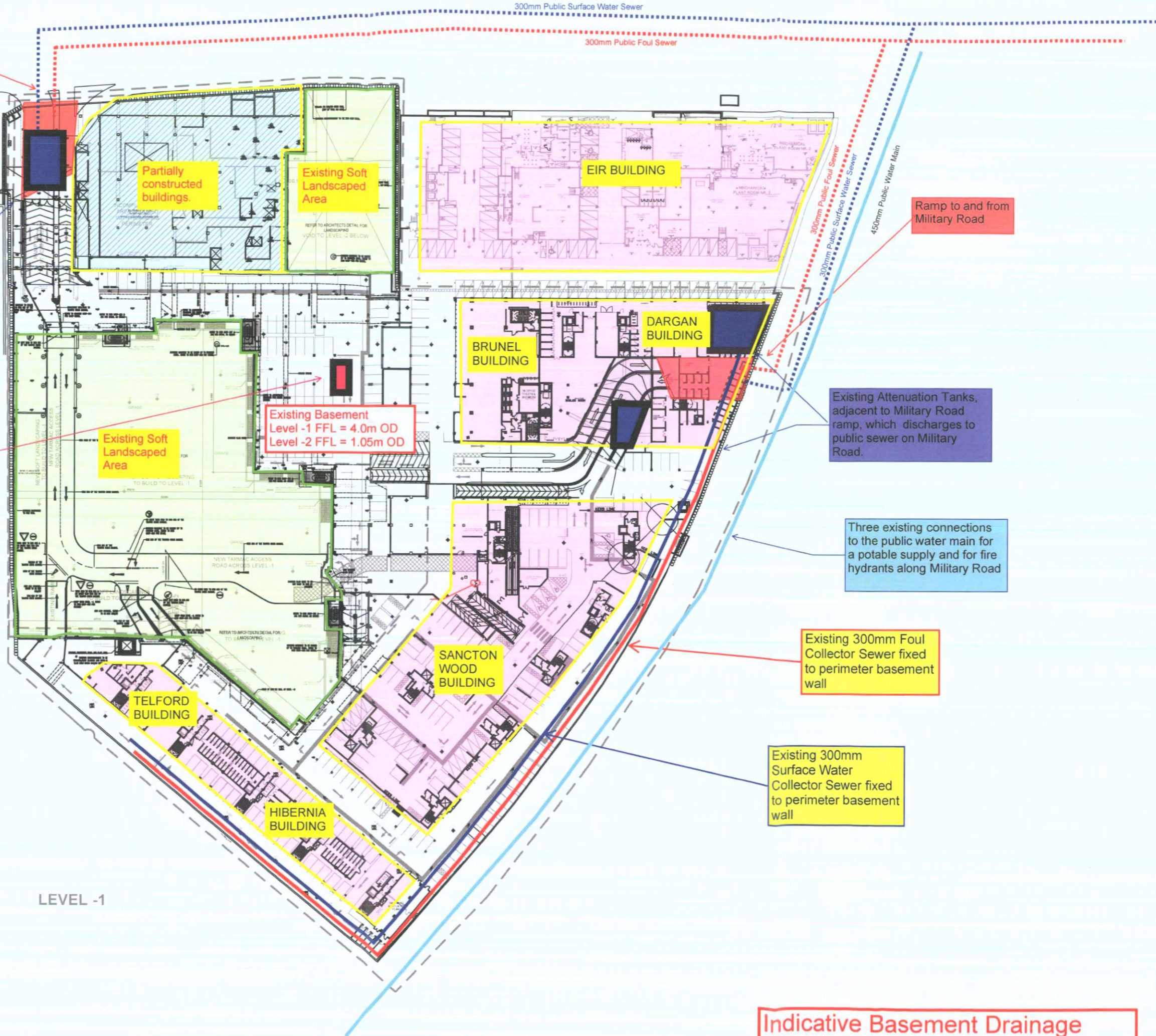
## Appendix H

### **Indicative Existing Infrastructure**

Ramp to and from St John's Road

Existing Attenuation Tank, adjacent to Military Road ramp, which discharges to public sewer on Military Road.

Existing foul tank below basement slab (Level -2) collecting existing basement gullies. Effluent is pumped to last private manhole at Military Road.



LEVEL -1

Indicative Basement Drainage

**APPENDIX 8C**  
**IRISH WATER DRAINAGE RECORDS**

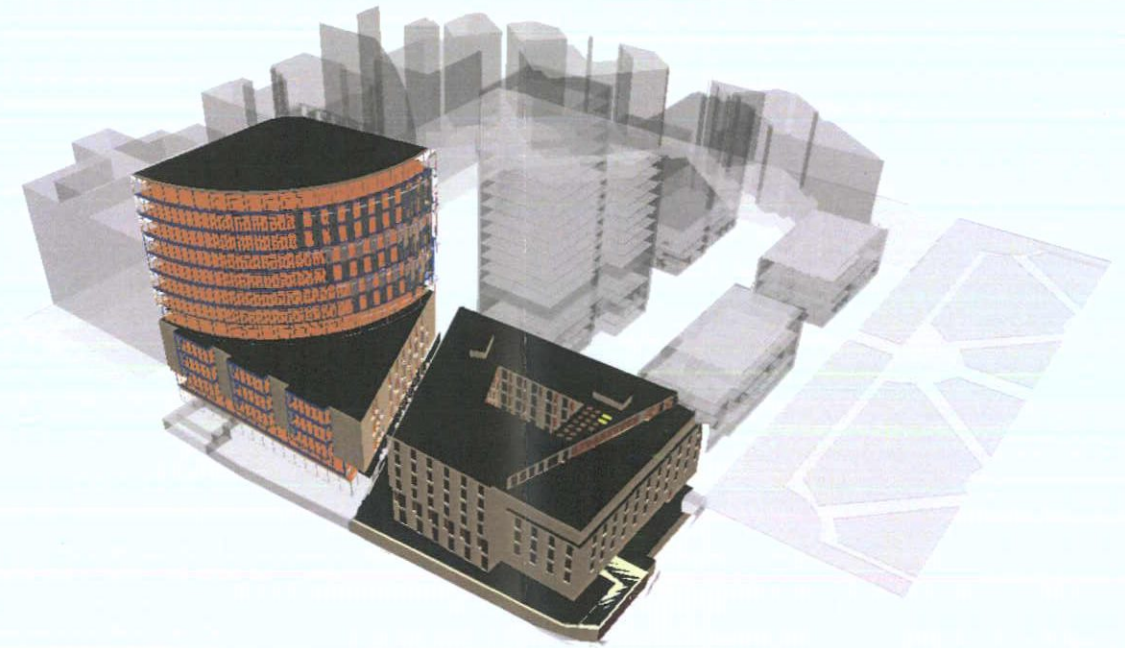




**APPENDIX 9A**  
**ENERGY ANALYSIS REPORT**



HEUSTON SOUTH QUARTER  
COMMERCIAL DEVELOPMENT  
ST JOHNS ROAD WEST  
Dublin 8



DCC PLAN NO: 4610/22  
RECEIVED: 04/08/2022

Energy Analysis Report  
IN2 Project No. D2026  
20/07/2022  
REV04

## Revision History

Date	Revision	Description
18/02/2022	00	Initial issue for review
22/02/2022	01	Report updated in accordance with Design Team recommendations.
14/03/2022	02	Report updated to include Planning issue Description of Development
05/05/2022	03	Report updated to include Revised images in accordance with Planning Conditions
20/07/2022	04	Report updated to include Revised Hotel Design in accordance with Planning Conditions

IN2 Engineering Design Partnership operates a formal Integrated Management System, with certification to ISO: 9001 Quality Management System, ISO: 14001 Environmental Management System and OSHAS: 18001 Health and Safety Management System.

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## 1.0 Executive Summary

This report compiles the results of Part L Compliance analysis undertaken for the proposed Commercial development at Heuston South Quarter, Dublin 8. The analysis is based on information as received from Reddy Architecture and Urbanism.

The proposed Commercial development comprises of Hotel and Office buildings. The hotel comprises of six storeys over basement of hotel accommodation arranged around a courtyard. The Office building comprises of 12 storeys over ground floor and basement, with naturally day light office space to the perimeter arranged around a central core where circulation and associated storage and toilet spaces etc are located.

The Dublin City Council Climate Action Plan 2019 – 2024 was adopted as part of the international plan to curb climate change. The plan requires a 20% reduction of energy use for the whole city and for a 33% reduction for the Council's own energy by 2020, with the EU Mayors Adapt Initiative agreeing to reduce carbon dioxide emissions by at least 40% by 2030, with a requirement for 20% of energy to come from renewable sources.

The EU Energy Performance of Buildings Directive (EPBD) requires that all new developments be designed to be Near-Zero Energy Buildings (NZEB) from 2020.

The proposed commercial development was assessed to ensure compliance with the planning policy context for energy reduction, renewable energy contribution and carbon emissions in accordance with both the "Dublin City Council Climate Action Plan 2019 – 2024" and the Technical Guidance Document (TGD) Part L 2021 of the Building Regulations with additional attention paid to control of excessive solar gain to ensure minimum waste of energy required for cooling.

Part L 2021 provides guidance as to how to ensure that the effects of solar gain are limited to buildings and this methodology was applied to both hotel and office buildings. Section 2.0 of this report outlines how this was undertaken, determining for each elevation (on a storey-by-storey basis) of the respective buildings, the required glazing performance (measured as Total heat Transmittance or g-value) required for each facade element to ensure compliance.

The analysis determined that glazing performance could be generally in accordance with TGD Part L Appendix C (g=0.39) for both Office and Hotel, with some localised areas such as Level 11 of the Office requiring enhanced performance- a g-value of 0.23 being

recommended to some elements of this facade, which should be achievable with clear glazing incorporating solar film and/or fritting element.

Appendix A outlines the detailed calculations for Solar gain analysis, with facade solar performance (g-value) requirements being presented in 3D diagrammatic form in Appendix B.

TGD Part L 2021 ensures that new development in Ireland is in accordance with the EU Directive for NZEB by setting targets for Primary Energy, Carbon Emissions and Renewable Energy contribution.

Section 5.0 outlines the methodology for Part L / NZEB analysis. The analysis confirms full compliance with the energy reduction, carbon emissions reduction and renewable energy contributions requirements to TDG Part L 2021 of the Building Regulations for both the Hotel and Office buildings and therefore the Dublin Climate Action Plan 2019-2024. In each case compliance has been achieved through a combination of Passive design features, Low-energy systems, supplemented by renewable technologies.

The Hotel is proposed to utilise Air Source Heat Pumps (ASHP's) for both hot water consumption and perimeter/ ventilation heating, which, in conjunction with Variable Refrigerant Flow (VRF) air conditioning to Bedrooms will ensure a high degree of renewable energy provision to the building equating to 44% well in excess of the 20% required by the Dublin City Council Climate Action Plan 2019 -2024 and 10% required by TGD Part L 2021.

Similarly, the Office building is proposed to avail of renewable-based heating by ASHP's throughout, supplemented also by an extensive Photovoltaic (PV) solar panel array (600m<sup>2</sup> area) located at roof level, which also provides screening to Heating Ventilation and Air Conditioning (HVAC) plant. This renewable energy contribution of 28% exceeds that required by both the Climate Action Plan and the Building Regulations.

Overall, the proposed Commercial development has been determined to be fully compliant with the Dublin Climate Action Plan 2019-2024 and TGD Part L 2021, with both Hotel and Office achieving Solar and Energy Performance requirements based on characteristics detailed within this report.

Finally, the proposed building designs utilise a fully electrical HVAC and services strategy, free from onsite fossil fuel usage and therefore minimising local anthropogenic gas emissions.

## 2.0 Site Description

The proposed development will provide a mixed-use commercial development comprising of a hotel (241 no. bedrooms) and an office block providing a cumulative Gross Floor Area (GFA) of 32,602, inclusive of basement area. The proposed development consists of:

- Site clearance and localised demolitions to remove part of the podium and Basement Level -1 reinforced concrete slabs at the interface of the proposed hotel and office blocks, together with the incorporation of part of the existing basement level structure extending to approximately 4,228 sq.m (GFA).
- The proposed basement will be integrated within the existing basement levels serving the wider HSQ development and will be accessed from the existing vehicular ramped accesses/egresses onto/off St. John's Road West and Military Road to the north and east, respectively. The proposed basement area is split into two areas to provide a dedicated Hotel Basement area of approximately 2,132 sq.m (GFA) and an Office basement area of 2,096 sq.m (GFA).
- The construction of a 5-storey hotel (over lower ground and basement level) to provide 238 no. bedrooms. At basement level provision is made for 24 no. car parking spaces; 2 no. motorcycle spaces together with plant and storage rooms. A waste storage area with dedicated loading bay / staging area is provided along with dedicated set-down area for deliveries. A service bay for the dual purpose of waste storage collection and bus drop-off to serve the hotel is also provided at basement level with modifications to existing line markings to the basement parking area to accommodate the development. At Lower Ground floor level provision is made for 14 no. Bedrooms; Bar; Kitchen and Staff facilities and Changing Rooms / WCs plus ancillary Gym. This floor is arranged around an internal courtyard space. Provision is made at Podium level for 19 no. Bedrooms; Dining Area and Foyer with entrance at the South-Eastern corner of the building onto the new laneway separating the hotel and office building. Provision is made at the south-western corner at podium level for an ESB sub-station / switch room and 15 no Sheffield type bicycle stands are provided for the hotel and the retail / café unit, providing storage space for 30 no. bicycles. A total of 205 no. bedrooms are provided at the upper levels (above podium level). The top floor of the hotel (4th floor) has a splayed setback to provide a west facing roof terrace. An ancillary hotel bar (118 sq.m) opens onto this roof terrace.



Fig 2.1 – Proposed Site Layout

## 2.0 Site Description (Cont.d)

- The construction of a 12-storey (over lower ground and basement levels) office building to the east of the hotel building to provide 19,474 sq.m of office floorspace (GFA) from lower ground floor level and above. Provision is made at basement level for 30 no. car parking spaces; 2 motorcycle spaces and 120 no. bicycle storage spaces together with plant and storage rooms. Provision is made for a further 196 no. bicycle storage spaces at Lower Ground floor level plus changing rooms. At podium level 2 no. ESB sub-stations and switch rooms are proposed. The foyer and entrance are provided at the southern end of the building at Podium level along with a Retail/Café unit of 208 sq.m at the South-Western corner of the building. The building is setback at 4th floor level to provide a west facing roof terrace. Splayed setbacks to the southern and eastern elevations at the 11th floor level forms a roof terrace that wraps around the South-Eastern corner of the building. Plant is provided at rooftop level that is enclosed by curved louvred screens and PV panels.
- Works proposed along the St John's Road West frontage include the omission of the existing left-turn filter lane to the vehicular ramped access to the HSQ development and re-configuration of the pedestrian crossings at the existing junction together with the re-configuration of the existing pedestrian crossing over the westbound lanes of St. John's Road West leading to an existing pedestrian refuge island and re-alignment of the existing footpath along the site frontage onto St John's Road West to tie into the reconfigured junction arrangement.
- Drainage works proposed include the provision of 2 no. below basement surface water attenuation tanks with duty/stand-by arrangement pump sumps and associated valve chambers, and 2 no. below basement foul pump sumps with duty/stand-by arrangement and 24hr emergency storage and associated valve chambers. New foul drainage and stormwater drainage connections are proposed to existing foul and storm sewers in St. John's Road West with associated site works.
- Hard and soft landscaping works are proposed at lower ground level along St John's Road West and at podium level to provide for the extension and completion of the public plaza to the south of the proposed Office Block and the provision of two new pedestrian laneways connecting St John's Road West with the public plaza at podium level.

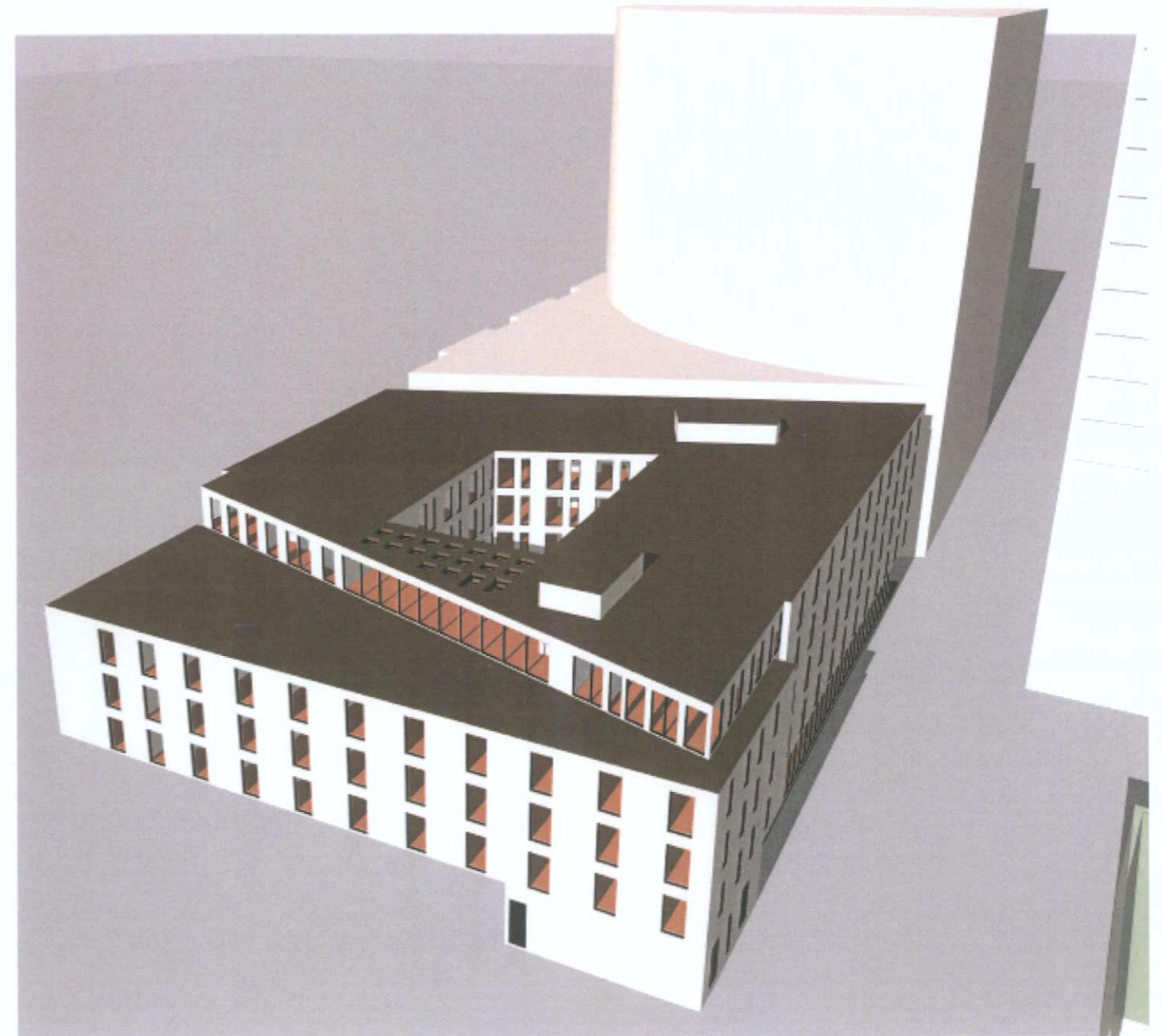


Fig 2.2 – Tas 3D Dynamic Simulation Model of The Proposed Hotel Building

### 3.0 Planning Policy Requirements

The fifth assessment report by the Intergovernmental Panel on Climate Change (IPCC) in 2014 confirmed that warming of the atmosphere and ocean system is happening and that there is clear human influence on the climate.

Whilst climate change is a global scale problem requiring a multi-faceted international response, the overall challenge for Ireland is to develop and improve its inter-disciplinary approach. The EU has committed to reducing greenhouse gases to 20% below 1990 levels by the year 2020, and this sets a higher target than that set in Kyoto for 2012.

Based on the EU approach, the framework requests local authorities to prepare and publish local adaptation plans which will complement mitigation actions and reduce our vulnerability to the negative impacts of climate change.

The Climate Action and Low Carbon Development Bill 2015 was passed in December 2015 and requires the preparation of a new national mitigation plan and an adaptation framework.

The Dublin City Council Climate Action Plan 2019 - 2024 was adopted in response to this and sets out policies and objectives to achieve a 20% reduction of energy use for the whole city and for a 33% reduction for the Council's own energy by 2020, along with 20% of energy to come from renewable sources, with the EU Mayors Adapt Initiative agreeing to reduce carbon dioxide emissions by at least 40% by 2030. The plan includes adaptation measures to reduce our vulnerability to the negative impacts of climate change and mitigating actions to reduce emissions of the greenhouse gases that are driving climate change.

As key strategies it sets out to increase the share of renewable energy generation to reduce energy consumption and find alternative, non-polluting, and renewable sources for energy provision, and improve energy efficiency in the built environment, reducing energy demand and energy wastage/loss in order to reduce CO<sub>2</sub> contributions.

Design and layout of schemes by maximising benefits from energy efficient passive measures such as natural ventilation and lighting and reduction of cooling requirement through control of excessive solar gain is encouraged.

In Section 4.0, solar gain through the building is assessed in accordance with the requirements of TGD Part L 2021 to ensure that energy required for cooling is not excessive.

Section 5.0 below illustrates how through achieving and exceeding NZEB/ PART L 2021 performance, the requirements of Dublin City Council Climate Action Plan 2019 - 2024 for energy reduction, carbon reduction and renewable energy usage would be met.



Fig 3.1 – Tas 3D Dynamic Simulation Model of The Proposed Office Building



## 4.0 Solar Gain Compliance

### 4.1 Methodology

Part L of the Building regulations requires limitation of solar gain through the building fabric to minimise energy required for cooling.

Thermal analysis was undertaken for all occupied perimeter zones areas of the building using Dynamic Simulation Modelling (TAS software). This involved creating a three dimensional (3D) representational model of the building including its form, materials, and constructions, glazing and shading, both local and from neighbouring buildings.

Using the model, the annual predicted solar gain was calculated for each occupied space within both the Office and Hotel buildings and the result compared with the maximum allowable target. Each space was assessed based on the assumed performance values as indicated in Appendix A Tables A.1 and A2.

### 4.2 Results

Two spaces within the Hotel building were identified as requiring enhanced glazing performance (ranging from 0.34 to 0.38 g-value) in order to meet the building regulation requirements, namely the Hotel Bar on the uppermost floor and the Dining Area located on the ground floor.

The high proportion of glazing to the office building resulted in further enhanced glazing performance (ranging from 0.24 to 0.38 g-value) being required. The result and required g-value for each occupied space is presented in Appendix A, Table A1 for the Hotel and Table A2 for the Office.

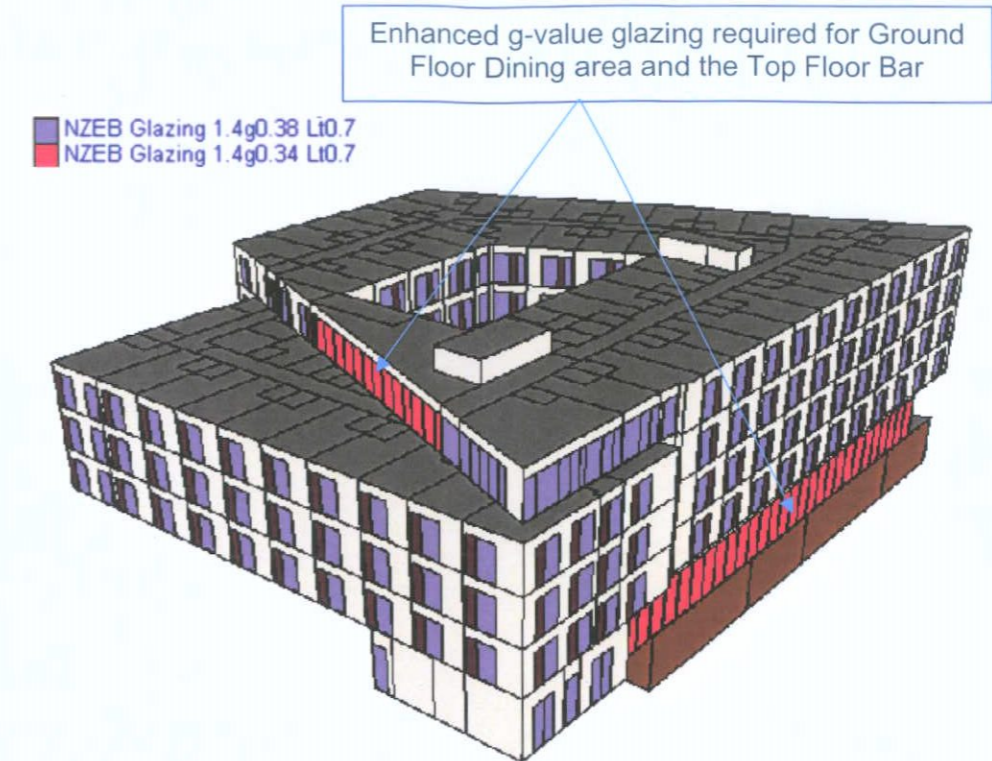


Fig 4.1 - Recommended glazing g-value required to achieve Solar Gain Compliance for the Hotel

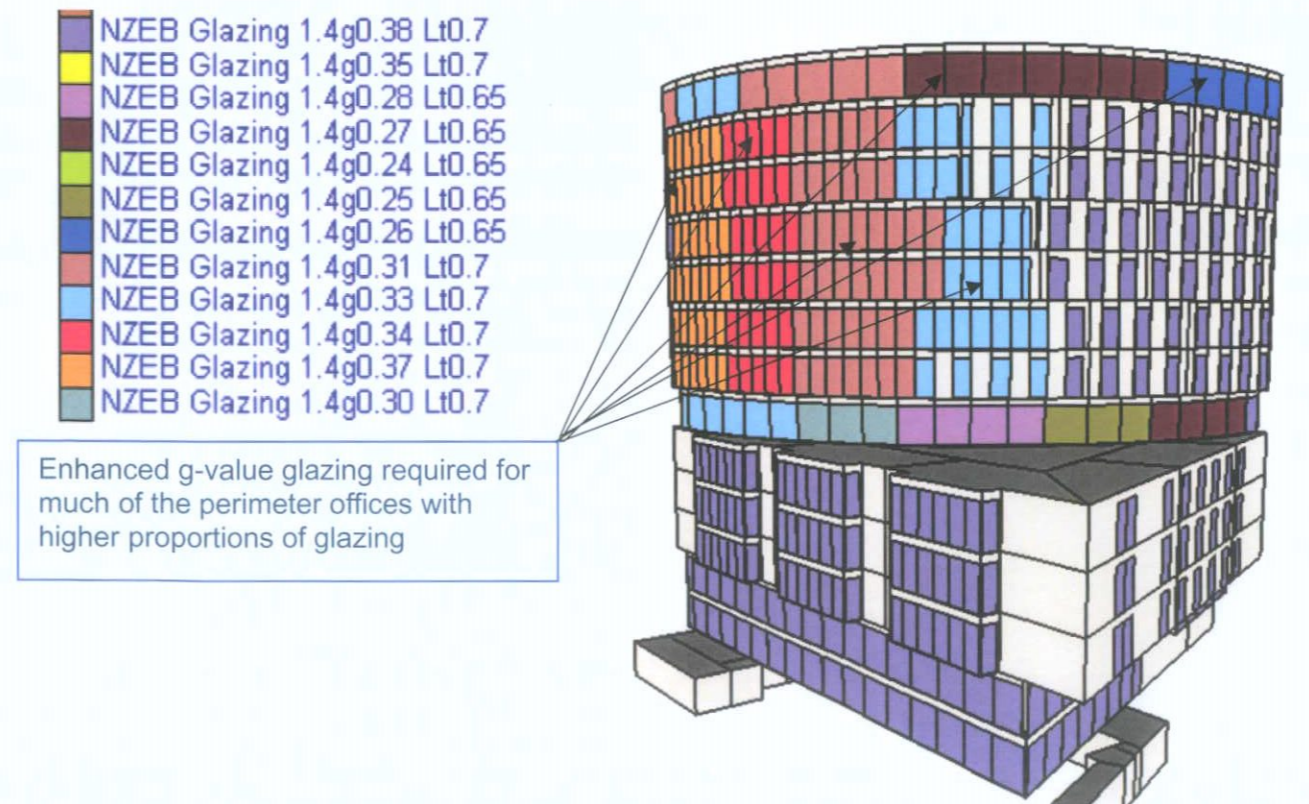


Fig 4.2 - Recommended glazing g-value required to achieve Solar Gain Compliance for the Office Building

## 5.0 Energy / Part L 2021 Compliance

The EU Energy Performance of Buildings Directive (EPBD) requires that all new developments be designed to be Near-Zero Energy Buildings (NZEB) from 2020.

This directive has been interpreted for Ireland as requiring both a substantial reduction in Primary Energy (of the order of 50-60% below the Part L 2008 benchmark), with significant proportion of that (10-20% of energy) being provided by Renewable Energy sources “either on-site or nearby (i.e., energy from PV panels, ASHP heating systems or district heating systems etc.)”.

### 5.1 NZEB Methodology

The NZEB methodology involves comparing the “Actual Building” energy performance as proposed against a “Reference Building”.

This directive has been interpreted for Ireland as requiring both a substantial reduction in Primary Energy (of the order of 50-60% below the Part L 2008 benchmark), with significant proportion of that (10-20% of energy) being provided by Renewable Energy sources “either on-site or nearby (ie. energy from Photovoltaic panels or air source heat pump systems etc.)”.

In order to demonstrate NZEB compliance, a representative model for both the office and hotel buildings, was used to calculate the predicted Primary Energy usage for the “Actual” building as designed, based on the proposed fabric and HVAC service values as illustrated in Tables C1 and C2 in Appendix C.

The calculated primary energy consumption of the “Actual Building” is divided by that of the NZEB “Reference Building”, the result being the Energy Performance Coefficient (EPC) of the “Actual Building”.

The Renewable Energy Ratio (RER) is calculated by dividing the renewable energy contribution as a proportion of overall Primary Energy provided. To demonstrate that an acceptable Primary Energy consumption rate has been achieved, the calculated EPC of the building being assessed should be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC) as defined within Part L 2021.

## BRIRL Output Document

Compliance Assessment with the Building Regulations (Ireland) TGD-Part L 2017

This report demonstrates compliance with specific aspects of Part L of the Building Regulations. Compliance with all aspects of Part L is a legal requirement. Demonstration of how compliance with every aspect is achieved may be sought from the Building Control Authority.

## HSQ2 Proposed Hotel

Date: Tue Jul 19 18:13:38 2022

### Administrative Information

#### Building Details

Address: HSQ2 Proposed Hotel, Heuston South Quarter, Dublin 2, Dublin 2,

#### NEAP

Calculation engine: SBEMIE

Calculation engine version: v5.5.h.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.0.0

BRIRL compliance check version: v5.5.h.2

#### Client Details

Name: HSQ2

Telephone number:

Address: Dublin 2, Dublin, Dublin 2

#### Energy Assessor Details

Name: Alex O'Toole

Telephone number: 01 4960900

Email: Alex.OToole@IN2.ie

Address: Studio E&F Mountpleasant Buisness Centre, Dublin, D06

### Primary Energy Consumption, CO2 Emissions, and Renewable Energy Ratio

The compliance criteria in the TGD-L have been met.

Calculated CO2 emission rate from Reference building	63.3 kgCO2/m2.annum
Calculated CO2 emission rate from Actual building	46.2 kgCO2/m2.annum
<b>Carbon Performance Coefficient (CPC)</b>	<b>0.73</b>
<b>Maximum Permitted Carbon Performance Coefficient (MPCPC)</b>	<b>1.15</b>
Calculated primary energy consumption rate from Reference building	344 kWh/m2.annum
Calculated primary energy consumption rate from Actual building	234.7 kWh/m2.annum
<b>Energy Performance Coefficient (EPC)</b>	<b>0.68</b>
<b>Maximum Permitted Energy Performance Coefficient (MPEPC)</b>	<b>1</b>
<b>Renewable Energy Ratio (RER)</b>	<b>0.44</b>
<b>Minimum Renewable Energy Ratio</b>	<b>0.1</b>

Fig 5.1 – HSQ2 Hotel - PART L 2021 Energy Compliance

## 5.0 Energy / Part L 2021 Compliance (Cont'd)

### 5.2 NZEB Results

The proposed Hotel building as designed was found to fully comply with the energy requirements Part L 2021, 32% below the MPEPC energy target and 36% below the carbon target MPCPC. A renewable energy contribution RER of the high efficiency ASHP serving in particular the hot water energy demand was predicted to achieve 44% of the primary energy well in excess of the 10% Part L 2021 renewable energy requirement (and the 20% required by the Dublin City Council Climate Action Plan 2019-2024).

Figure 5.1 indicates how the hotel was determined to be compliant to Part L 2021 with the following performance:

NZEB / Part L 2021 Target		Results	
MPEPC	< 1.0	0.68	Compliant
MPCPC	< 1.15	0.73	Compliant
RER	≥ 0.2'	0.44	Compliant

<sup>1</sup>10% required for NZEB / Part L 2021, 20% for Dublin City Council Climate Action Plan 2019-2024

Furthermore, full compliance with the energy requirements of Part L 2021 were determined for the Office building design as illustrated in Figure 5.2.

The combination of ASHP technology for heating and extensive PV array at roof level combining to ensure primary energy 16% below the MPEPC, Carbon performance 25% below the MPCPC and renewable energy contribution of 28% exceeding the 10% renewable energy requirement of Part L 2021 (and the 20% required by the Dublin City Council Climate Action Plan 2019-2024) as illustrated below:

NZEB / Part L 2021 Target		Results	
MPEPC	< 1.0	0.84	Compliant
MPCPC	< 1.15	0.86	Compliant
RER	≥ 0.2'	0.28	Compliant

<sup>1</sup>10% required for NZEB / Part L 2021, 20% for Dublin City Council Climate Action Plan 2019-2024

The detailed characteristics for the building fabric (U-values, thermal bridging etc.), Mechanical and Electrical (M&E) systems, (lighting, Air Handling Units (AHU) fan efficiencies etc.) and renewable technologies (ASHP, PV array etc), are detailed in Appendix C, with Tables C1 and C2 for the Hotel and Office building respectively.

In addition, Preliminary Building Energy Rating (BER) analysis was undertaken for both the Hotel and Office building, with an A3 determined for each. Appendix D includes the relevant Provisional BER Certificates for each building.

## BRIRL Output Document

### Compliance Assessment with the Building Regulations (Ireland) TGD-Part L 2017

This report demonstrates compliance with specific aspects of Part L of the Building Regulations. Compliance with all aspects of Part L is a legal requirement. Demonstration of how compliance with every aspect is achieved may be sought from the Building Control Authority.

## HSQ2 Office

Date: Thu Feb 17 21:47:09 2022

### Administrative Information

#### Building Details

Address: Dublin 2,

#### Client Details

Name: HSQ2

Telephone number:

Address: Dublin 2, Dublin, Dublin 2

#### NEAP

Calculation engine: SBEMIE

Calculation engine version: v5.5.h.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.0.0

BRIRL compliance check version: v5.5.h.2

#### Energy Assessor Details

Name: Alex O'Toole

Telephone number: 01 4960900

Email: Alex.OToole@IN2.ie

Address: Studio E&F Mountpleasant Buisness Centre, Dublin, D06

### Primary Energy Consumption, CO2 Emissions, and Renewable Energy Ratio

The compliance criteria in the TGD-L have been met.

Calculated CO2 emission rate from Reference building	18.4 kgCO2/m2.annum
Calculated CO2 emission rate from Actual building	15.9 kgCO2/m2.annum
<b>Carbon Performance Coefficient (CPC)</b>	<b>0.86</b>
<b>Maximum Permitted Carbon Performance Coefficient (MPCPC)</b>	<b>1.15</b>
Calculated primary energy consumption rate from Reference building	95.6 kWh/m2.annum
Calculated primary energy consumption rate from Actual building	80.6 kWh/m2.annum
<b>Energy Performance Coefficient (EPC)</b>	<b>0.84</b>
<b>Maximum Permitted Energy Performance Coefficient (MPEPC)</b>	<b>1</b>
<b>Renewable Energy Ratio (RER)</b>	<b>0.28</b>
<b>Minimum Renewable Energy Ratio</b>	<b>0.1</b>

Fig 5.2 – HSQ2 Office - PART L 2021 Energy Compliance

## 6.0 APPENDIX A

Table A1 – SOLAR GAIN RESULTS - Hotel

Zone Name	Facade Length (m)	Floor Area (m <sup>2</sup> )	Actual Solar Gain (kWh)	Solar Gain Limit (kWh)	Solar Gain (%)	g-Value Required	Compliant
L00 Bedroom 3 E	18.0	84.7	2725	4323	-37	0.38	Yes
L00 Bedroom 4 E	9.2	51.5	1256	2209	-43	0.38	Yes
L00 Bedroom 5 E	2.4	21.7	558	585	-5	0.38	Yes
L00 Bedroom 6 N	12.3	74.1	1852	2968	-38	0.38	Yes
L00 Bedroom1 N	22.6	97.8	2893	5437	-47	0.38	Yes
L00 Bedroom 2 NE	8.2	20.5	1470	1969	-25	0.38	Yes
L00 Dining N	14.4	85.8	2401	3473	-31	0.38	Yes
L00 Dining NE	8.1	34.5	1925	1958	-2	0.38	Yes
L00 Dining S	42.6	238.9	10156	10258	-1	0.35	Yes
L00 Dining SE	5.0	17.4	1006	1202	-16	0.38	Yes
L00 Foyer	3.1	17.9	719	735	-2	0.38	Yes
L00 LGF Bedroom 1 N	18.8	79.0	1581	4513	-65	0.38	Yes
L00 LGF Bedroom 2 N	3.8	18.9	394	924	-57	0.38	Yes
L00 LGF Bedroom 3 NE	8.2	20.5	493	1969	-75	0.38	Yes
L00 LGF Bedroom 4 N	10.7	54.3	1530	2565	-40	0.38	Yes
L00 LGF Bedroom 5 N	1.7	19.8	170	402	-58	0.38	Yes
L00 LGF Bedroom 6 E	2.4	21.7	525	585	-10	0.38	Yes
L00 LGF Bedroom 7 E	7.2	36.0	995	1731	-42	0.38	Yes
L00 LGF Bedroom 8 E	2.0	15.5	232	479	-52	0.38	Yes
L00 LGF Hotel Bar N	14.6	86.6	2861	3505	-18	0.38	Yes
L01 Bedroom 1 N	13.0	38.4	799	3120	-74	0.38	Yes
L01 Bedroom 10 S	6.1	33.6	306	1462	-79	0.38	Yes
L01 Bedroom 11 W	39.1	178.4	3733	9401	-60	0.38	Yes
L01 Bedroom 12 S	14.1	74.5	1226	3401	-64	0.38	Yes
L01 Bedroom 13 W	8.2	56.7	846	1969	-57	0.38	Yes
L01 Bedroom 14 W	2.6	30.0	111	634	-82	0.38	Yes
L01 Bedroom 15 S	6.0	24.5	329	1450	-77	0.38	Yes
L01 Bedroom 16 E	9.2	51.5	942	2209	-57	0.38	Yes
L01 Bedroom 17 N	10.7	55.1	1249	2565	-51	0.38	Yes
L01 Bedroom 18 N	1.7	19.8	133	402	-67	0.38	Yes
L01 Bedroom 19 NE	2.4	21.7	426	585	-27	0.38	Yes
L01 Bedroom 2 N	29.2	153.4	1918	7032	-73	0.38	Yes
L01 Bedroom 3 NE	8.7	24.0	453	2085	-78	0.38	Yes
L01 Bedroom 4 E	25.2	134.6	1600	6070	-74	0.38	Yes
L01 Bedroom 5 E	6.2	24.7	454	1487	-69	0.38	Yes
L01 Bedroom 7 S	5.6	18.8	533	1344	-60	0.38	Yes
L01 Bedroom 8 S	4.0	19.3	284	950	-70	0.38	Yes
L01 Bedroom 9 S	28.5	154.9	2418	6862	-65	0.38	Yes
L02 Bedroom 1 N	13.0	38.4	803	3120	-74	0.38	Yes
L02 Bedroom 10 E	7.2	36.0	856	1731	-51	0.38	Yes
L02 Bedroom 11 NE	2.4	21.7	462	585	-21	0.38	Yes
L02 Bedroom 12 SE	11.0	26.3	501	2648	-81	0.38	Yes
L02 Bedroom 13 S	5.6	18.8	534	1344	-60	0.38	Yes