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## Drainage Design Report

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### Property:

No. 19 & No. 21  
CONNAUGHT STREET,  
PHIBSBOROUGH, DUBLIN 7

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### Architect:

KENNETH HENNESSY  
ARCHITECTS

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### Date of Report:

02/07/2021

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### Project Ref. No.:

20155

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#### Directors:

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Table of Contents

1.0 Introduction ..... 2

2.0 Existing public drainage ..... 2

3.0 Foul Water Drainage ..... 2

4.0 Surface Water Drainage Design ..... 2

4.1 Attenuated Discharge to Existing Combined Foul ..... 2

Appendix A - Location Map ..... 3

Appendix B - Existing Drainage Map ..... 4

Appendix C - Proposed Drainage Layout & Details ..... 5

Appendix D - Attenuation Storage Design Spreadsheet and Rainfall Data ..... 6

Producer:	Date:	Reviewer:	Date:	Approver:	Date:	Revision Status:	Description:
GM	02/07/2021	EF	02/07/2021	BMG	02/07/2021	1 <sup>st</sup>	1 <sup>st</sup> issue

## 1.0 Introduction

DRA Consulting Engineers were appointed by Dublin City Council to prepare a drainage plan for the proposed demolition and rebuilding of the existing dwellings at No. 19 & No. 21 Connaught Street, Phibsborough, Dublin 7. See Appendix A – Site Location Map.

This report includes a description of the proposed drainage works and the relative design appendix.

## 2.0 Existing public drainage

The existing public sewers servicing the site are combined **sewers located on the public road “Connaught Street” at the North-East side of the site.** See Appendix B – Existing Drainage Map.

## 3.0 Foul Water Drainage

The proposed development matches the existing premise and so will not increase the foul load on the existing public sewer.

The foul drainage system on site will be completely renovated. See Appendix C – Proposed Drainage Layout & Details.

## 4.0 Surface Water Drainage Design

The proposed development does not increase extent of hard area surface water run off and so will not increase the surface water load on the existing combined public sewer. SUDS measures will be provided to manage the rate of surface water discharge into the combined sewer.

### 4.1 Attenuated Discharge to Existing Combined Foul

The size of the roof area to be drained on to the existing public sewer will not be altered by the proposed works.

The surface water captured by the roof and the new court yard will be attenuated below ground by 2No. layers of Permavoid 150 or similar approved storage system and slowly discharged in to the existing combined foul at the North-East side of the site. Stormwater drainage dead legs will be available at the North-East side of the site for future use for both No. 19 & No. 21 Connaught Street. See Appendix C – Proposed Drainage Layout & Details.

The design of the attenuation storage capacity is based on Rainfall Data Issued by Met Eireann for the site location and for 100 years return period, increased by 20% to consider the future variation caused by climate changes and a discharge rate of 0.4l/s. See Appendix D – Attenuation Storage Design Spreadsheet and Rainfall Data.

*End of Report*

Yours sincerely,

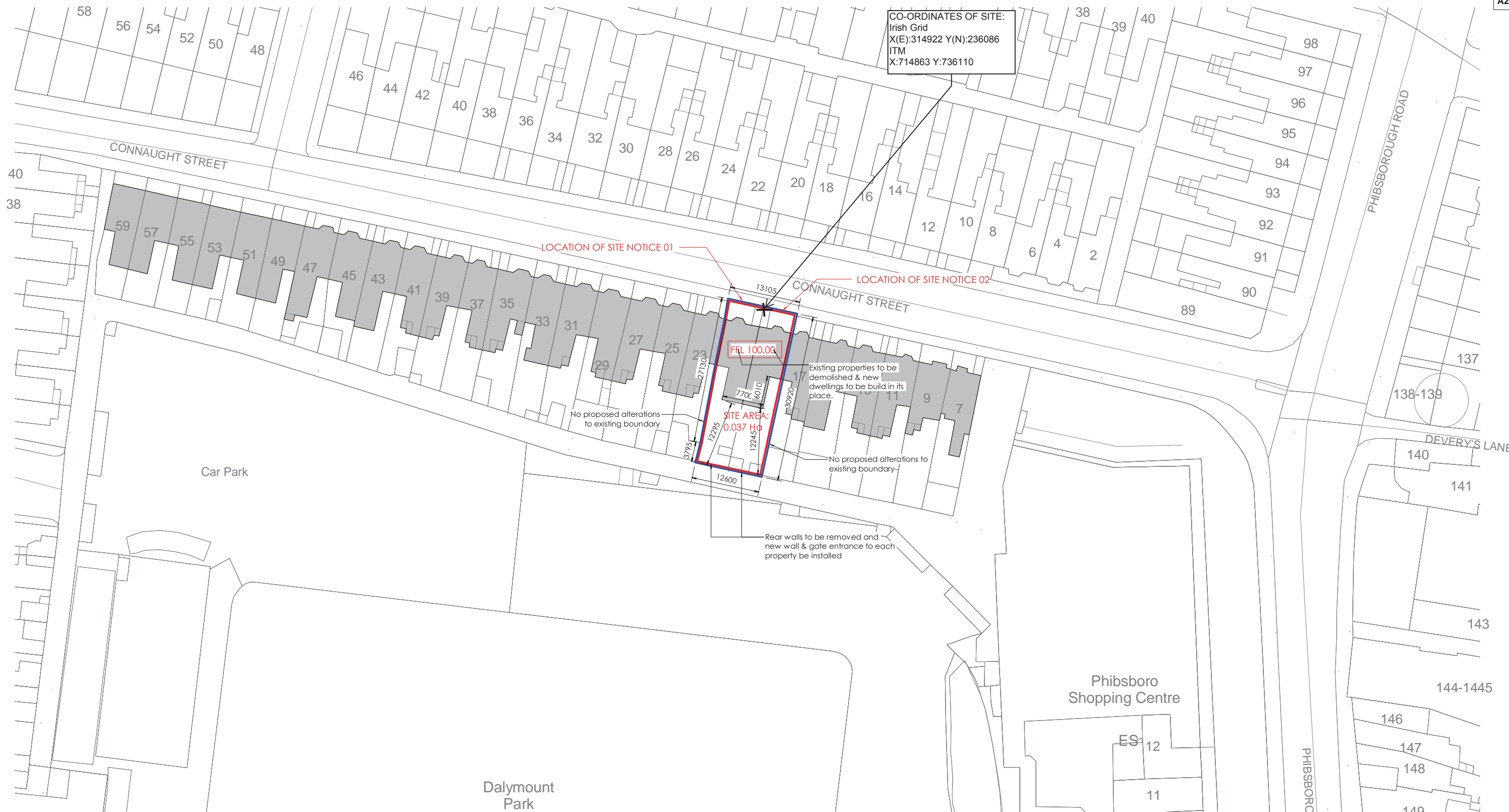


Eilish Funston

Chartered Engineer

Date: 02/07/2021

## Appendix A - Location Map



**1 PROPOSED SITE PLAN**  
1 : 500

**OUTLINE SPECIFICATION**

Existing buildings to be demolished. Front existing features to be retained upon rebuild. North elevation to be red brick to match street.  
Pitch roof to comprise of blue/black slate in select colour to match street, on timber battens on felt on insulated timber roof structure. All ceilings to be insulated and finished with foil-backed plasterboard.  
Ground floor to consist of cast in situ concrete slab over 150mm Xtratherm or similar rigid floor insulation over radon barrier over sand blinding and well compacted hardcore.

External walls to be Red brick cavity wall construction with 110mm Xtratherm or similar rigid insulation. Internal leave to be rendered and painted to a selected colour. All load bearing walls supported on reinforced continuous concrete strip foundations  
All external doors and windows to be selected composite Aluclad/Timber/PVC double/triple glazed, with precast concrete/stone cills. All glazing to be low emmissivity K glass to comply with TGD Part L Building 2019

Front yard and railing to be reinstated upon completion to tie into the street.  
Storm drainage to be 100 diameter wavin laid to 1:150 minimum fall. Surface drainage to discharge to public system.  
Foul Drainage laid to 1:60 approx fall to discharge to existing public sewer.

**PROPOSED AREA SCHEDULE**

Existing Dwelling Floor Area No. 19:	xxx.xx m <sup>2</sup>
Existing Dwelling Floor Area No. 21:	xxx.xx m <sup>2</sup>
Proposed Dwelling Floor Area No. 19:	xxx.xx m <sup>2</sup>
Proposed Dwelling Floor Area No. 21:	xxx.xx m <sup>2</sup>



05/03/2021 12:11:29

**STANDARD INSTRUCTIONS**

1 THE MAIN CONTRACTOR, SUB-CONTRACTOR OR SUPPLIER SHALL:  
VERIFY ALL DIMENSIONS ON SITE AND IMMEDIATELY REPORT TO THE ARCHITECT ANY DISCREPANCIES ON THE DRAWINGS.  
WORK TO FIGURED DIMENSIONS ONLY (EXCEPT WHERE FULL SIZE DETAILS ARE PROVIDED).  
NOT VARY ANY WORK SHOWN ON THE DRAWINGS WITHOUT OBTAINING PRIOR APPROVAL FROM THE ARCHITECT.  
BE RESPONSIBLE FOR REQUESTING FROM THE ARCHITECT ANY ADDITIONAL INFORMATION REQUIRED.  
SUPPLY TO THE ARCHITECT ALL SHOP DRAWINGS, ILLUSTRATIONS, SPECIFICATIONS, ETC., OF ALL SPECIALIST WORK TO BE INCORPORATED IN THE MAIN CONTRACT WORKS.

IMMEDIATELY INFORM THE ARCHITECT IF ANY WORK SHOWN ON THIS DRAWING IS NOT IN ACCORDANCE WITH THE RELEVANT CODES OF PRACTICE RECOGNISED GOOD PRACTICE THROUGHOUT THE INDUSTRY AND DOES NOT COMPLY WITH THE RELEVANT LOCAL AUTHORITY BYELAWS OR BUILDING REGULATIONS.  
IMMEDIATELY ADVISE THE ARCHITECT / QUANTITY SURVEYOR OF THE EFFECT UPON PROGRAMME AND COST OF ANY ALTERATIONS TO THE PROPOSED WORKS SHOWN ON THIS DRAWING.  
2 THIS DRAWING SUPERSEDES ALL PREVIOUS ISSUES OF THE SAME DRAWING NUMBER WITH EARLIER REVISIONS.  
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**GENERAL NOTES**

ALL DIMENSIONS TO BE CHECKED ON SITE.  
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS AND DRAWINGS.  
IN THE EVENT OF ANY DISCREPANCIES BETWEEN DRAWINGS THE CONTRACTOR IS TO INFORM THE ARCHITECT IMMEDIATELY.  
DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.  
ALL WORK TO COMPLY WITH CURRENT BUILDING REGS & S.S.

**REVISION REGISTER**

NO	DATE	DESCRIPTION	BY	CHKD
01	01/03/2021	PLANNING DRAWINGS	BM	MC

**RIA**  
Registered Architect  
2019  
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fax: 052 6180690  
email: info@khaarchitects.ie  
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Clonmel, Co. Tipperary

**KHA**  
KENNETH HENNESSY ARCHITECTS

CLIENT: Dublin City Council  
PROJECT: 19 Connaught Street, Phibsborough, Dublin  
DRAWING TITLE: PROPOSED SITE PLAN  
DRAWING NUMBER: 2010 KHA ZZ ZZ DR PD 0002 S1 P 01

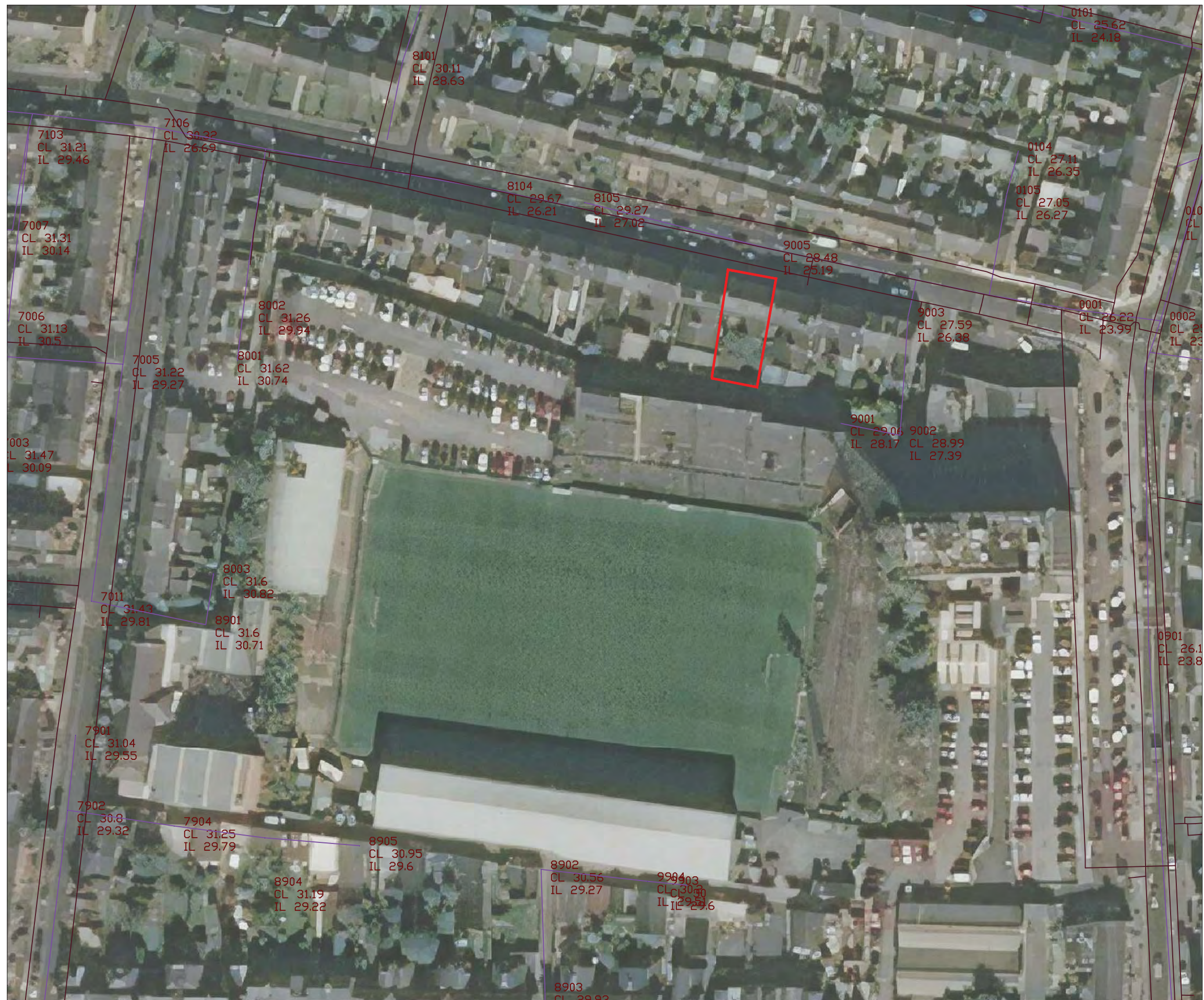
SCALE: As indicated @ A2  
STATUS: PLANNING DRAWING

**DRAFT**

## Appendix B - Existing Drainage Map



# Existing Drainage Records Received from Irish Water on 30/06/2021





## Appendix C - Proposed Drainage Layout & Details

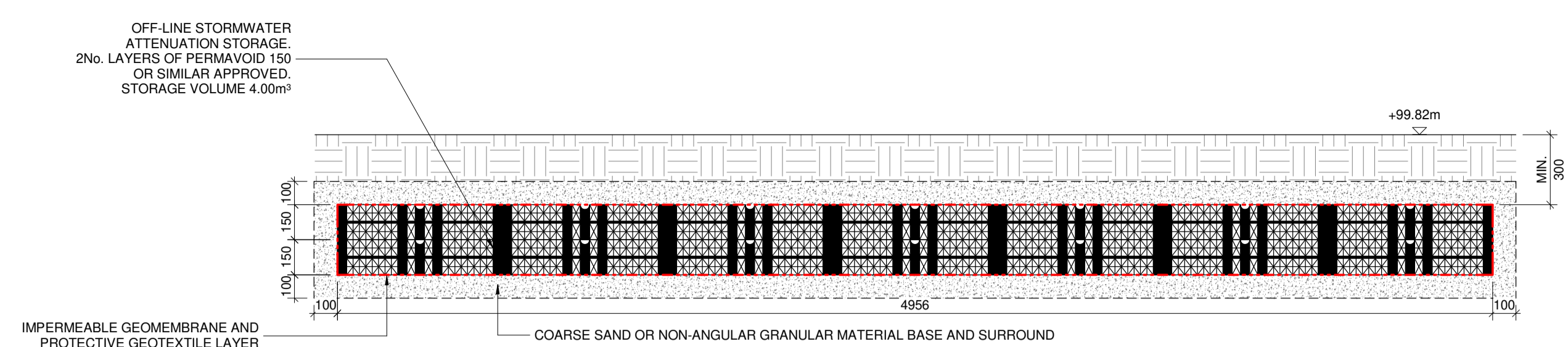


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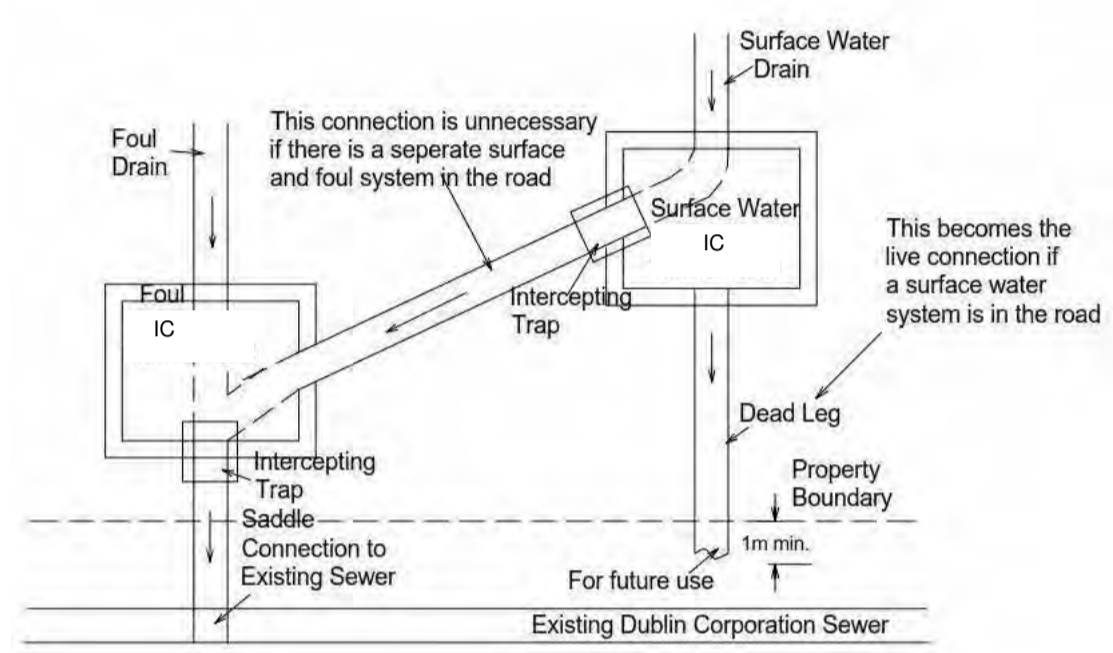
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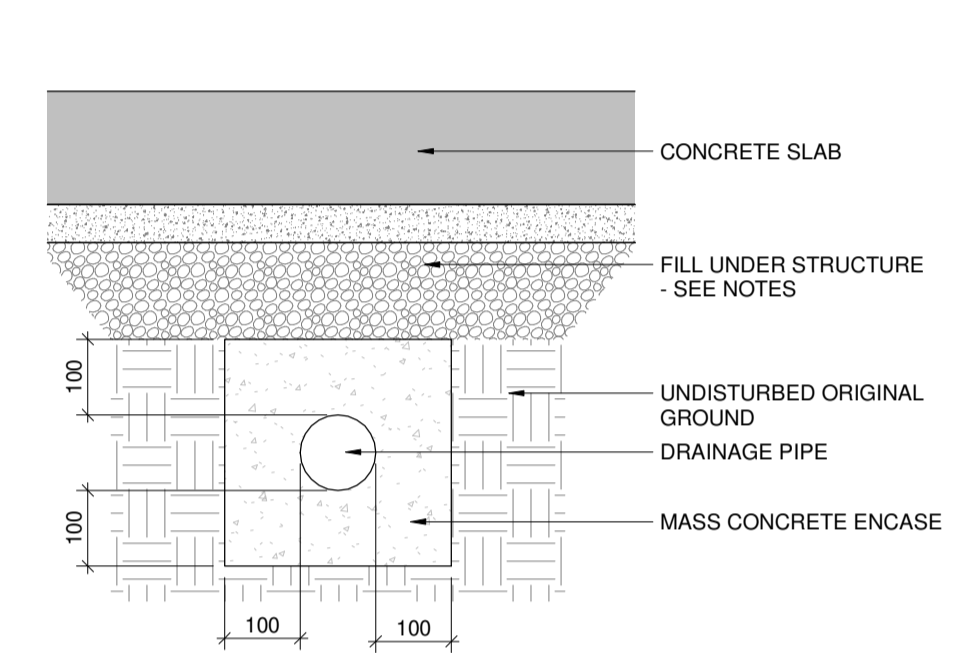
- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED OTHERWISE.
  - USE FIGURED DIMENSIONS ONLY. DO NOT SCALE. ALL DIMENSIONS TO BE CHECKED ON SITE AND CONFIRMED PRIOR TO COMMENCING WORKS. ANY ERROR OR DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER / ARCHITECT.
  - DRAWINGS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SERVICE ENGINEERS DRAWINGS AND SPECIFICATIONS.
  - ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH PLANNING GRANT CONDITIONS, CURRENT BUILDING REGULATIONS AND GOOD BUILDING PRACTICE.
  - ALL WASTEWATER DRAINAGE DETAILS AND CONSTRUCTION TO BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS AND CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE (DOCUMENT NO. IW-CDS-5030-01 & IW-DS-9300-03 RESPECTIVELY).
  - ALL WATER INFRASTRUCTURE DETAILS AND CONSTRUCTION TO BE IN ACCORDANCE WITH IRISH WATER'S STANDARD DETAILS AND CODE OF PRACTICE FOR WATER INFRASTRUCTURE (DOCUMENT NO. IW-CDS-5020-01 & IW-CDS-5020-03 RESPECTIVELY).
  - PIPE SPECIFICATION
    - PIPE UNDER STRUCTURES
      - PIPES UNDER STRUCTURES TO BE CONCRETE ENCASED WITH 100mm 35N20 CONCRETE SURROUND
      - CONCRETE ENCASEMENT IS TO EXTEND 500mm PAST STRUCTURE
      - LAYER OF COMPRESSIBLE MATERIAL (SUCH AS 50mm POLYSTYRENE) IS TO BE PLACED OVER CONCRETE ENCASEMENT TO PREVENT LOADING FROM THE STRUCTURE OVER
      - COMPRESSIBLE MATERIAL IS TO EXTEND 150mm EACH SIDE OF CONCRETE ENCASEMENT
    - FOUL & SURFACE WATER
      - 100mm Ø uPVC, IN COMPLIANCE WITH BS 4660 AND BS EN 1401-PART 1
      - TO BE LAID AT FALLS OF 1/40 (2.5%)
      - TO BE IN COMPLIANCE WITH PART H, 2010 OF THE BUILDING REGULATIONS
      - SURFACE WATER DRAINAGE TO COMPLY WITH THE CURRENT VERSION OF THE 'GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS'
  - ALL COVER LEVELS TO BE CHECKED IN SITU TO ENSURE THAT THEY ARE LEVEL WITH THE SURROUNDING FINISHED SURFACES.



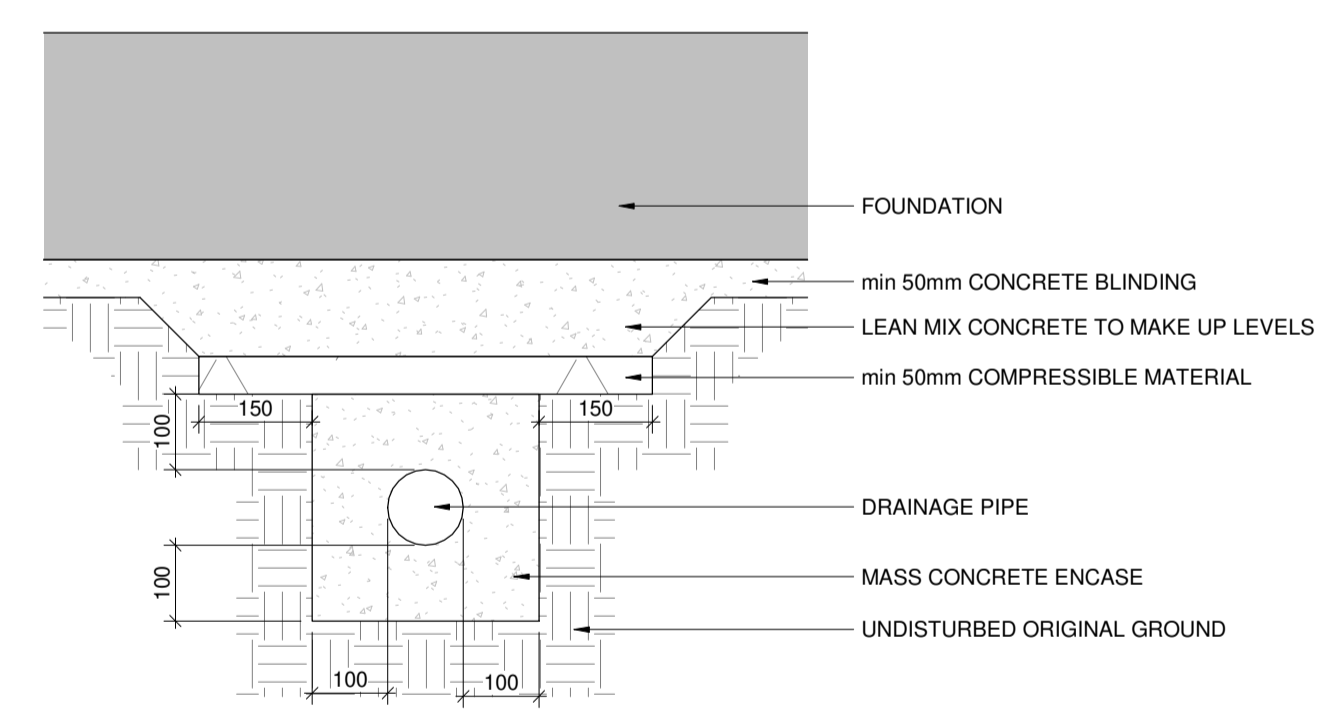
**2 ATTENUATION STORAGE SECTION**  
SCALE 1 : 20



**3 CONNECTION TO COMBINE SEWER**  
SCALE 1 : 100

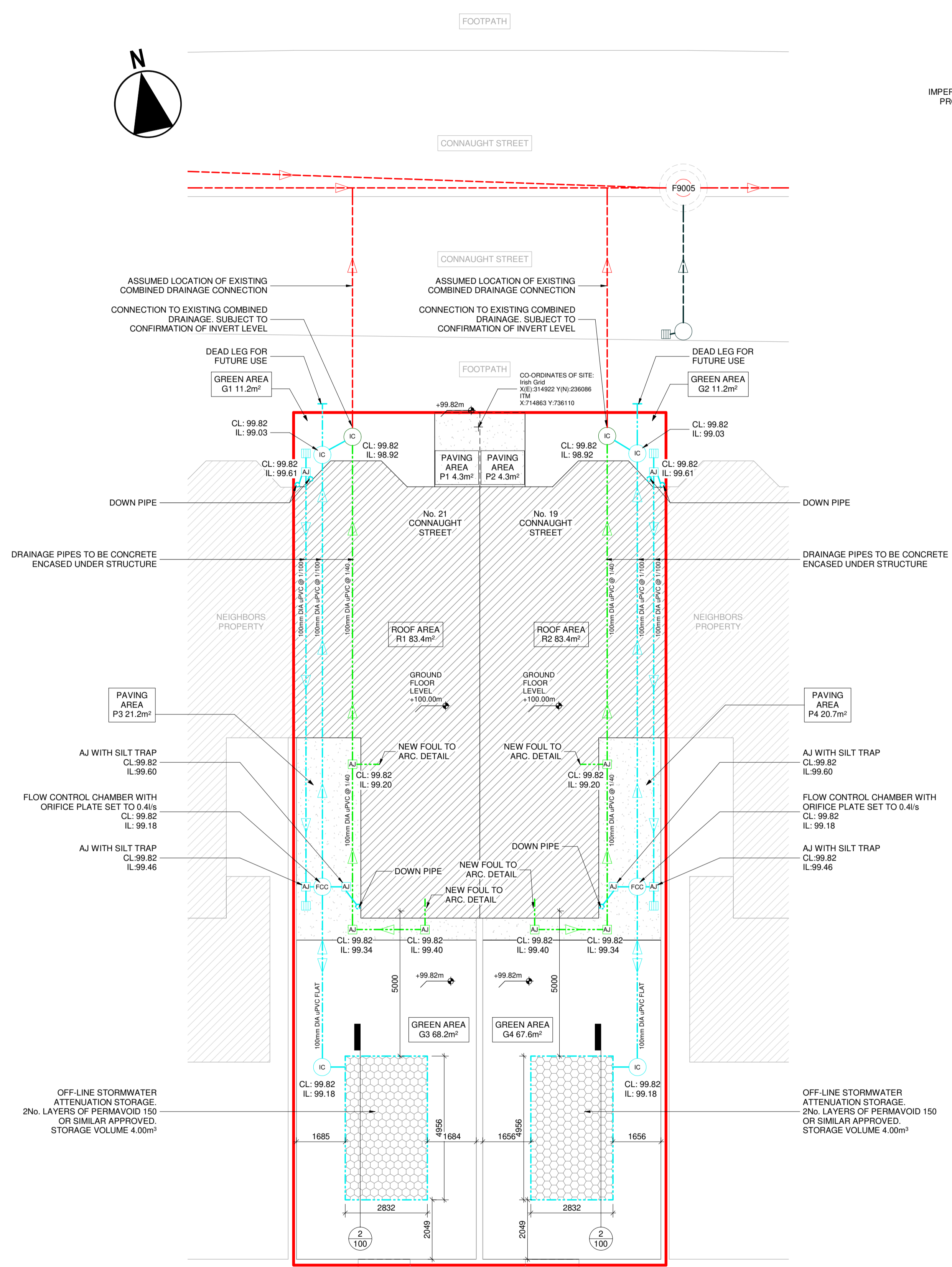


**4 PIPE UNDER SLAB**  
SCALE 1 : 100



**5 PIPE UNDER FOUNDATION**  
SCALE 1 : 100

- LEGEND**
- EXISTING COMBINED FOUL AND SURFACE WATER
  - NEW FOUL
  - EXISTING STORMWATER
  - NEW STORMWATER
  - EXISTING WATERMAIN
  - NEW WATERMAIN
  - SITE BOUNDARY LINE
  - MH - MANHOLE
  - IC - INSPECTION CHAMBER
  - AJ - ACCESS JUNCTION
  - GT - GULLY TRAP
  - BIG - BACK INLET GULLY
  - S1.0 STORMWATER MANHOLE NO.
  - F1.0 FOUL MANHOLE NO.
  - CL COVER LEVEL
  - IL INVERT LEVEL



**1 PROPOSED DRAINAGE LAYOUT**  
SCALE 1 : 100

**No. 19 CONNAUGHT ST.**

TABLE 1 - EXISTING DRAINAGE ARRANGEMENT	HARD AREA	HARD AREA DRAINED DIRECTLY TO PUBLIC SEWER
ROOF AREA	83.9m²	83.9m²
PAVING AREA	25.0m²	25.0m²
TOTAL		108.9m²

TABLE 2 - PROPOSED DRAINAGE ARRANGEMENT	HARD AREA	HARD AREA DRAINED DIRECTLY TO PUBLIC SEWER	HARD AREA SLOWLY DRAINED TO PUBLIC SEWER AT 0.4l/s
R2 (ROOF AREA)	83.4m²	-	83.4m²
P2+P4 (PAVING)	25.0m²	-	25.0m²
TOTAL		-	108.4m²

STORAGE VOLUME REQUIRED = 3.90m³  
(PROVIDED 4.00m³ USING 2No. LAYERS OF PERMAVOID 150 OR SIMILAR APPROVED)

**No. 21 CONNAUGHT ST.**

TABLE 3 - EXISTING DRAINAGE ARRANGEMENT	HARD AREA	HARD AREA DRAINED DIRECTLY TO PUBLIC SEWER
ROOF AREA	133.0m²	133.0m²
PAVING AREA	25.0m²	25.0m²
TOTAL		158.0m²

TABLE 4 - PROPOSED DRAINAGE ARRANGEMENT	HARD AREA	HARD AREA DRAINED DIRECTLY TO PUBLIC SEWER	HARD AREA SLOWLY DRAINED TO PUBLIC SEWER AT 0.4l/s
R1 (ROOF AREA)	83.4m²	-	83.4m²
P1+P3 (PAVING)	25.5m²	-	25.5m²
TOTAL		-	108.9m²

STORAGE VOLUME REQUIRED = 3.92m³  
(PROVIDED 4.00m³ USING 2No. LAYERS OF PERMAVOID 150 OR SIMILAR APPROVED)

REV.	DESCRIPTION	GM	EF	02/07/2021
1	ISSUED FOR PLANNING			

**PLANNING**

**DRA**  
CONSULTING ENGINEERS

NSAI  
NSAI Certified

DUBLIN 01-216-2956 LIMERICK 061-310-701 WEXFORD 053-915-2814 E: info@draconsulting.ie W: www.draconsulting.ie

ARCHITECT:  
**KENNETH HENNESSY ARCHITECTS**

PROJECT:  
**No. 19 & No. 21 CONNAUGHT STREET, PHIBSBOROUGH, DUBLIN**

TITLE:  
**PROPOSED DRAINAGE LAYOUT & DETAILS**

DATE: 02/07/2021 SCALES: As indicated @ A1

DESIGNER: GM DRG. No. REV.

PRODUCER: GM

VERIFIER: EF

APPROVER: BMG

**20155-100**

**1**

## Appendix D - Attenuation Storage Design Spreadsheet and Rainfall Data

# 19 CONNAUGHT ST, DUBLIN SURFACE WATER DRAINAGE ATTENUATION

Job No: 20155

DESIGN 100 YEAR RETURN PERIOD + 20%

Design By: GM

Date: 01/07/21

AREA: 187.20 m<sup>2</sup>

**Notes:** Rainfall Data used was Issued By Met Eireann for Dublin City  
Design Outflow = Flow control limiting flow to maximum 0.4 l/s based on Orifice flow device (or similar approved)



## Surface Water Attenuation Design

Total Allowable Outflow **0.40 l/s**

Duration (minutes)	Met Eireann Rainfall (mm)	Rainfall (mm) + 20%	Rainfall + 20% (m3/ha)	Roof Flow (m3)	Green Field Flow (m3)	Footpath Flow (m3)	Proposed Total Outflow (m3)	Proposed Un-Attenuated Outflow Rate (l/s)	Attenuated Outflow (m3)	Storage (m3)
5	14.70	17.64	176.40	1.47	0.21	0.44	2.12	7.069	0.120	2.00
10	20.60	24.72	247.20	2.06	0.29	0.62	2.97	4.953	0.240	2.73
15	24.20	29.04	290.40	2.42	0.34	0.73	3.49	3.879	0.360	3.13
30	29.90	35.88	358.80	2.99	0.42	0.90	4.31	2.396	0.720	3.59
60	37.00	44.40	444.00	3.70	0.52	1.11	5.34	1.483	1.440	3.90
120	45.70	54.84	548.40	4.57	0.65	1.37	6.59	0.916	2.880	3.71
180	51.70	62.04	620.40	5.17	0.73	1.55	7.46	0.691	4.320	3.14
240	56.50	67.80	678.00	5.65	0.80	1.70	8.15	0.566	5.760	2.39
360	64.00	76.80	768.00	6.41	0.91	1.92	9.23	0.427	8.640	0.59
540	72.40	86.88	868.80	7.25	1.03	2.17	10.44	0.322	12.960	-2.52
720	79.10	94.92	949.20	7.92	1.12	2.37	11.41	0.264	17.280	-5.87

Max Storage

## Contribution Areas

Roof	83.4	m <sup>2</sup>	0.008	Hectares	100 % Impervious
Footpath	25	m <sup>2</sup>	0.003	Hectares	100 % Impervious
Green Area	78.80	m <sup>2</sup>	0.008	Hectares	15 % Impervious
<b>Total</b>	<u>187.20</u>	<u>m<sup>2</sup></u>	<u>0.019</u>	<u>Hectares</u>	



# 21 CONNAUGHT ST, DUBLIN SURFACE WATER DRAINAGE ATTENUATION

Job No: 20155

DESIGN 100 YEAR RETURN PERIOD + 20%

Design By: GM

Date: 01/07/21

AREA: 188.30 m<sup>2</sup>

**Notes:** Rainfall Data used was Issued By Met Eireann for Dublin City  
Design Outflow = Flow control limiting flow to maximum 0.4 l/s based on Orifice flow device (or similar approved)



## Surface Water Attenuation Design

Total Allowable Outflow **0.40 l/s**

Duration (minutes)	Met Eireann Rainfall (mm)	Rainfall (mm) + 20%	Rainfall + 20% (m3/ha)	Roof Flow (m3)	Green Field Flow (m3)	Footpath Flow (m3)	Proposed Total Outflow (m3)	Proposed Un-Attenuated Outflow Rate (l/s)	Attenuated Outflow (m3)	Storage (m3)
5	14.70	17.64	176.40	1.47	0.21	0.45	2.13	7.104	0.120	2.01
10	20.60	24.72	247.20	2.06	0.29	0.63	2.99	4.977	0.240	2.75
15	24.20	29.04	290.40	2.42	0.35	0.74	3.51	3.898	0.360	3.15
30	29.90	35.88	358.80	2.99	0.43	0.91	4.33	2.408	0.720	3.61
60	37.00	44.40	444.00	3.70	0.53	1.13	5.36	1.490	1.440	3.92
120	45.70	54.84	548.40	4.57	0.65	1.40	6.63	0.920	2.880	3.75
180	51.70	62.04	620.40	5.17	0.74	1.58	7.50	0.694	4.320	3.18
240	56.50	67.80	678.00	5.65	0.81	1.73	8.19	0.569	5.760	2.43
360	64.00	76.80	768.00	6.41	0.91	1.96	9.28	0.430	8.640	0.64
540	72.40	86.88	868.80	7.25	1.03	2.22	10.50	0.324	12.960	-2.46
720	79.10	94.92	949.20	7.92	1.13	2.42	11.47	0.265	17.280	-5.81

Max Storage

## Contribution Areas

Roof	83.4 m <sup>2</sup>	0.008 Hectares	100 % Impervious
Footpath	25.5 m <sup>2</sup>	0.003 Hectares	100 % Impervious
Green Area	79.40 m <sup>2</sup>	0.008 Hectares	15 % Impervious

**Total** 188.30 m<sup>2</sup> 0.019 Hectares



Met Eireann  
Return Period Rainfall Depths for sliding Durations  
Irish Grid: Easting: 314920, Northing: 236078,

DURATION	Interval		Years													
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.5,	4.1,	5.0,	5.6,	6.0,	7.6,	9.3,	10.5,	12.1,	13.6,	14.7,	16.5,	17.9,	19.1,	N/A ,
10 mins	3.4,	4.9,	5.7,	7.0,	7.8,	8.4,	10.6,	13.0,	14.6,	16.9,	19.0,	20.6,	23.0,	25.0,	26.6,	N/A ,
15 mins	4.1,	5.8,	6.7,	8.2,	9.2,	9.9,	12.4,	15.3,	17.2,	19.9,	22.3,	24.2,	27.1,	29.4,	31.2,	N/A ,
30 mins	5.4,	7.6,	8.7,	10.5,	11.7,	12.7,	15.7,	19.2,	21.5,	24.8,	27.7,	29.9,	33.3,	36.0,	38.3,	N/A ,
1 hours	7.1,	9.9,	11.3,	13.6,	15.0,	16.2,	20.0,	24.2,	27.0,	30.8,	34.3,	37.0,	41.1,	44.2,	46.8,	N/A ,
2 hours	9.4,	12.9,	14.7,	17.5,	19.3,	20.7,	25.3,	30.4,	33.8,	38.4,	42.5,	45.7,	50.5,	54.3,	57.4,	N/A ,
3 hours	11.0,	15.0,	17.1,	20.2,	22.3,	23.9,	29.1,	34.8,	38.5,	43.7,	48.2,	51.7,	57.1,	61.2,	64.6,	N/A ,
4 hours	12.4,	16.8,	19.1,	22.5,	24.7,	26.5,	32.1,	38.3,	42.3,	47.8,	52.7,	56.5,	62.2,	66.6,	70.2,	N/A ,
6 hours	14.6,	19.6,	22.2,	26.1,	28.6,	30.6,	36.8,	43.7,	48.2,	54.4,	59.8,	64.0,	70.3,	75.1,	79.1,	N/A ,
9 hours	17.2,	22.9,	25.9,	30.2,	33.1,	35.3,	42.3,	50.0,	55.0,	61.9,	67.8,	72.4,	79.4,	84.7,	89.0,	N/A ,
12 hours	19.3,	25.6,	28.8,	33.5,	36.7,	39.1,	46.7,	55.0,	60.4,	67.8,	74.2,	79.1,	86.5,	92.2,	96.8,	N/A ,
18 hours	22.7,	29.9,	33.5,	38.9,	42.4,	45.1,	53.6,	62.9,	68.9,	77.0,	84.1,	89.5,	97.7,	103.9,	109.0,	N/A ,
24 hours	25.5,	33.3,	37.4,	43.2,	47.0,	49.9,	59.2,	69.2,	75.6,	84.4,	92.0,	97.8,	106.5,	113.2,	118.6,	137.2,
2 days	31.2,	40.1,	44.6,	51.1,	55.3,	58.5,	68.5,	79.2,	86.0,	95.3,	103.3,	109.3,	118.4,	125.2,	130.8,	149.8,
3 days	35.8,	45.6,	50.5,	57.4,	61.9,	65.4,	76.0,	87.4,	94.6,	104.3,	112.7,	119.0,	128.4,	135.5,	141.3,	160.9,
4 days	39.9,	50.3,	55.6,	63.0,	67.8,	71.4,	82.6,	94.6,	102.1,	112.3,	120.9,	127.5,	137.2,	144.6,	150.6,	170.8,
6 days	47.0,	58.6,	64.4,	72.6,	77.8,	81.8,	94.1,	107.0,	115.1,	126.0,	135.3,	142.2,	152.6,	160.4,	166.7,	188.0,
8 days	53.2,	65.9,	72.2,	81.0,	86.7,	90.9,	104.1,	117.8,	126.4,	138.0,	147.8,	155.1,	166.0,	174.2,	180.8,	203.0,
10 days	58.9,	72.6,	79.2,	88.7,	94.7,	99.2,	113.1,	127.6,	136.6,	148.8,	159.0,	166.7,	178.1,	186.6,	193.5,	216.6,
12 days	64.2,	78.7,	85.8,	95.7,	102.1,	106.8,	121.4,	136.6,	146.1,	158.7,	169.4,	177.4,	189.2,	198.1,	205.2,	229.0,
16 days	74.0,	90.1,	97.8,	108.7,	115.6,	120.8,	136.7,	153.1,	163.3,	176.9,	188.3,	196.8,	209.5,	218.9,	226.5,	251.7,
20 days	83.1,	100.5,	108.9,	120.6,	128.0,	133.6,	150.6,	168.1,	178.9,	193.3,	205.4,	214.5,	227.8,	237.7,	245.7,	272.2,
25 days	93.7,	112.6,	121.7,	134.4,	142.4,	148.4,	166.6,	185.4,	196.9,	212.2,	225.1,	234.7,	248.8,	259.3,	267.7,	295.7,

NOTES:

N/A Data not available

These values are derived from a Depth Duration Frequency (DDF) Model

For details refer to:

'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',

Available for download at [www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies\\_TN61.pdf](http://www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf)