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RESIDENTIAL DEVELOPMENT AT TIG MO CHROÍ WITH A GROUPED HOUSING SCHEME

SUBMISSION UNDER PART 8

ENGINEERING DESIGN REPORT

Prepared by GK, Consulting Engineers

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29.05.2025

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1. INTRODUCTION

Dun Laoghaire Rathdown County Council intends to upgrade the existing halting sites at Tig Mo Chroí with a grouped housing scheme. The site is located on the Glenamuck road, Carrickmines, Dublin 18. The Site is an existing walled TAU site consisting of 1 no. single story house, and 3 no. day houses with ancillary mobile homes. The Works comprise of 66m^2 extensions of each of the 3 no. dayrooms. The site is accessed via a dedicated access road from Glenamuck Road South. A branch of proposed upgrade to Glenamuck road will run adjacent to the site entry access road. The site is bordered to the south and west by a separately accessed Football field and club; while Glenamuck road lies to the north boundary, and a greenfield site lies to the east boundary.

There is an existing tarmac surfaced play area – it is the intention to use this space as part of the temporary accommodation while upgrade of the Dayrooms is underway. Services Pop ups will be required for the temporary accommodation. Temporary Water and metered Electricity connections will be required.

GK Consulting Engineers are appointed as part of the multi-disciplinary Design Team, are tasked with preparing part 8 Publication Application for the site This "Engineering Services Report under Part 8" has been prepared to accompany the planning application.

Proposed development

- The Works comprise of 66m^2 extensions of each of the 3 no. dayrooms & associated site works

Image 1.1: Proposed site

1.1 DRAINAGE PROPOSALS

- The existing sewers on are denoted on as-built information received from Dun Laoghaire Rathdown CoCo. The foul sewer is connected via a 225mm foul line onto Glenamuck Road. The internal network will outfall onto the existing 225mm FW line.
- The concrete hard standing & roof runoff are connected to the main SW system which flows into an existing attenuation / infiltration system
- The existing water supply is denoted on as-built information received from Dun Laoghaire Rathdown CoCo. The internal service pipes are connected to a 100mmØ HPPE water main from Glenamuck Road

1.2 SUD's PROPOSALS

The Suds designs & selection are based on recommendations of Greater Dublin Regional Code of Practice V6.0

Table 1-1 DLRCoCO SuDS / Green Infrastructure Feasibility Checklist

SuDS Measures	Measures to be used on this site	Rationale for selecting/not selecting measure
Source Control		
Swales	N	Site levels and space constraints
Tree Pits	N	Pollution mitigation
Soakaways	Y	Reuse existing soakway
Infiltration trenches	N	Low infiltration potential on site
Permeable pavement Block paving	N	Existing concrete hard standing in place
Green Roofs	N	Roof type not suitable for residential development of this scale
Filter strips	N	Site levels and space constraints
Bio-retention systems/SUDS Pods	N	Site levels and space constraints
Blue Roofs	N	Roof type not suitable for residential
Filter Drain	N	Reuse existing soakway
Site Control		
Detention Basins/Swale	N	Site levels and space constraints
Retentions basins	N	Site levels and space constraints

Regional Control		
Ponds	N	Site levels and space constraints
Wetlands	N	Site levels and space constraints
Other		
Petrol/Oil interceptor	N	Roof runoff only Low risk so bypass separator not required
Attenuation tank – only as a last resort where other measures are not feasible	N	Site constraints and levels prevalent on site
Oversized pipes– only as a last resort where other measures are not feasible	N	Other measures deemed feasible / more effective

1.3 CONFIRMATION OF FEASABILITY IRISH WATER

A pre connection enquiry has been submitted to Irish Water (**CDS24004527**) and is currently under review by IW.

Once an updated CoF is received for the current development it will be submitted.

2. EXISTING SITE SERVICES LOCAL AUTHORITY NETWORKS

Referring to Dun Laoghaire County Council utility maps, & as-built drawings, the existing site is serviced as follows:

Foul Sewer
there is an existing 225mm sewer in place

Surface water
There is an existing 225mm sewer in place

Watermain
There is an existing 110mm HPPE water main in place

3. PERCOLATION TEST

The existing soakway is being retained

4. FOUL SEWER DESIGN

The foul drainage layout is indicated on Site Layout Drawing C103. The proposed sewer discharges by gravity via an onsite 225mm diameter uPVC to the existing public sewer.

Proposed gravity drainage system will be constructed with UPVC pipes to a minimum 1 is 80 fall and laid in accordance with the building regulations (section H) and in accordance with the selected pipe manufacturer's recommendations. All proposed works affecting the public drainage system will be subject to detailed agreement with the water and drainage department of DLRCoCo and with Irish Water. The individual pipe materials and gradients are chosen to ensure self-cleaning velocities (i.e. between approximately 0.75 and 1.8 m/sec) at flows greater than approximately 1/8 of the pipe bore. The uPVC pipe grade is ULTRARIB solid wall SN8 classification.

4.1 ESTIMATION OF FOUL WATER FLOWS

The existing foul effluent is estimated as follows, calculated in accordance with the Irish Water Code of Practice for Wastewater Infrastructure

Irish water Dry Weather Flow (DWF):

Domestic wastewater flow calculation in accordance with the DWF method outline in Appendix B -Irish Water Wastewater Guidelines.

DWF(Dry Weather Flow)	446	l/dwelling/day
Number of dwelling units	3	
Occupancy ratio	2.7	People
Per capita consumption	150	l/person/dat
Wastewater Volume	8028	l/day
Average Discharge (24 hrs)	0.09	l/s
Average Discharge (10 hrs)	0.22	l/s

The foul pipe network for the site is designed for a peak discharge of **0.25 l/s** based on the DWF method. This is within the capacity of the receiving public sewer system (Pending approval by IW)

The existing onsite network utilise 100mm/150mm/225 mm diameter uPVC at a minimum fall of 1:100 to satisfy level constraints. Chosen diameter allowable pipe flows are as follows:

- Allowable foul flow at 75 % of proportional depth for 150mm diameter pipes at min. gradient of 1:80 = 20 l/s (BS8301:1985 Figure 3).

Pipe sizes, gradients, invert and cover levels and connection to public sewers are shown on drawing C103

All connections will be in accordance with the requirements of Irish Water and the recommendations of IW Code of Practice for Wastewater Infrastructure.

5. SURFACE WATER DESIGN

The Site Drainage Layout Drawing No. C101 shows the existing surface water layout. There is existing concrete hard standing & roof runoff. Runoff is drained to an existing on site infiltration trench.

The surface water design methodology is in accordance with the criteria below:

- The pipe network is designed for a rainfall intensity of 50mm/hr, EN752 or 1in 2year return period;
- Allowance for 20% Climate change;
- Attenuation storage in accordance with SUDS & Dun Laoghaire County Council requirements;
- Design for interception of the first 5mm of all rainfall events;
- Designed based on Wallingford method outlined in the CIRIA Report R156 (1996) and SuDS Manual C753

5.1. EXISTING SITE DATA

Average annual rainfall data obtained from Met Eireann for the area is shown in the figure below.

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 318685, Northing: 228765,

	Interval		Years								
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.5,	3.7,	4.3,	5.2,	5.9,	6.4,	8.0,	9.9,	11.2,	13.0,	14.7,	16.0,	16.8,
10 mins	3.5,	5.1,	5.9,	7.3,	8.2,	8.9,	11.2,	13.8,	15.6,	18.2,	20.5,	22.2,	23.4,
15 mins	4.1,	6.0,	7.0,	8.5,	9.6,	10.4,	13.1,	16.3,	18.4,	21.4,	24.1,	26.2,	27.6,
30 mins	5.5,	7.8,	9.1,	11.0,	12.3,	13.3,	16.7,	20.5,	23.0,	26.6,	29.8,	32.4,	34.0,
1 hours	7.2,	10.2,	11.8,	14.2,	15.8,	17.0,	21.1,	25.8,	28.8,	33.2,	37.0,	40.0,	42.0,
2 hours	9.6,	13.3,	15.3,	18.2,	20.2,	21.8,	26.8,	32.4,	36.1,	41.3,	45.9,	49.4,	51.8,
3 hours	11.2,	15.5,	17.8,	21.1,	23.4,	25.1,	30.8,	37.1,	41.2,	47.0,	52.1,	56.0,	58.6,
4 hours	12.6,	17.3,	19.8,	23.5,	25.9,	27.8,	33.9,	40.8,	45.2,	51.4,	56.9,	61.1,	64.0,
6 hours	14.9,	20.2,	23.0,	27.2,	30.0,	32.1,	39.0,	46.6,	51.6,	58.5,	64.6,	69.2,	72.3,
9 hours	17.5,	23.6,	26.8,	31.5,	34.7,	37.1,	44.8,	53.3,	58.8,	66.5,	73.2,	78.4,	81.8,
12 hours	19.6,	26.4,	29.9,	35.0,	38.4,	41.0,	49.4,	58.6,	64.6,	72.8,	80.1,	85.6,	89.3,
18 hours	23.1,	30.8,	34.8,	40.6,	44.4,	47.4,	56.8,	67.1,	73.7,	82.8,	90.8,	96.9,	100.9,
24 hours	26.0,	34.4,	38.8,	45.1,	49.3,	52.5,	62.6,	73.8,	80.9,	90.7,	99.3,	105.8,	110.1,
2 days	32.2,	41.7,	46.5,	53.4,	57.9,	61.3,	72.1,	83.7,	91.1,	101.1,	109.8,	116.4,	120.8,
3 days	37.5,	47.8,	53.0,	60.4,	65.2,	68.9,	80.3,	92.5,	100.1,	110.6,	119.5,	126.3,	130.7,
4 days	42.3,	53.4,	58.9,	66.8,	71.8,	75.7,	87.7,	100.4,	108.3,	119.1,	128.4,	135.3,	139.9,
6 days	50.8,	63.2,	69.4,	78.0,	83.6,	87.8,	100.8,	114.5,	123.0,	134.5,	144.2,	151.6,	156.4,
8 days	58.5,	72.1,	78.8,	88.2,	94.2,	98.7,	112.6,	127.1,	136.1,	148.2,	158.5,	166.2,	171.2,
10 days	65.8,	80.4,	87.6,	97.6,	104.0,	108.8,	123.5,	138.8,	148.2,	160.9,	171.6,	179.6,	184.8,
12 days	72.6,	88.3,	95.9,	106.5,	113.2,	118.2,	133.7,	149.7,	159.6,	172.8,	183.9,	192.2,	197.6,
16 days	85.6,	103.0,	111.4,	123.1,	130.5,	136.0,	152.8,	170.1,	180.7,	194.8,	206.7,	215.6,	221.3,
20 days	97.9,	116.9,	126.0,	138.6,	146.6,	152.5,	170.5,	189.0,	200.3,	215.3,	227.8,	237.1,	243.2,
25 days	112.6,	133.4,	143.4,	157.0,	165.6,	172.0,	191.4,	211.2,	223.3,	239.2,	252.5,	262.4,	268.8,

NOTES:
These values are derived from a Depth Duration Frequency (DDF) Model update 2023
For details refer to:
'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',
Available for download at:
http://hdl.handle.net/2262/102417

Image 1.2: Proposed Site Rainfall Data

5.2. SURFACE WATER PIPE NETWORK DESIGN

The system is designed in accordance with BS8301: 1985 British Standard Code of Practice for Building Drainage. Two methods are compared with the greater used for the design.

METHOD 1 - BS8301 8.8.3 (Wallingford Method)

Qbar was calculated in accordance with the Wallingford Method for the exisiting Greendfields site and multiplied by the appropriate growth reduction curve factors.

Site Area = 4800m2

Qbar Applicable = 1.8l/s

METHOD 2 - BS8301 8.8.2 design for rainfall intensity of 50mm/hr

Outfall Flow = [(4800x0.7x 50/1000) / (60x60)] x1000 = 0.046 m3/s

The surface water pipe network is therefore designed to cater for an outfall of 0.046 m3/s, per the requirements of BS8301.

The proposed surface water network utilises 225 uPVC perforated pipes at a minimum fall of 1:100. The capacity of which based on a roughness value of Ks=0.6mm at full bore is 17.7l/s

5.3. ATTENUATION / INFILTRATION DESIGN

The existing infiltration trench is being retained. There is no new additional load being applied to this trench.

6. WATER DESIGN

6.1. WATER DEMAND

Reference is made to Irish Water Code of Practice for Water Infrastructure. Section 3.7.2, Average domestic daily demand in a development can be established based on daily per-capita consumption, house occupancy, number of properties, etc. For design purposes the average daily, domestic demand shall be based on a per-capita consumption of 150 l/person/day and an average occupancy ratio of 2.7 persons per dwelling unit. The average day/peak week demand should be taken as 1.25 times the average daily domestic demand.

Based on the Architects schedule of accommodation.

Number of units	3	units
Daily Domestic Demand	150	l/person/day
Average Daily Domestic Demand	1215	litres/day
Peak Daily Demand	1518.75	litres/day
Peak hour Demand (10hr Day)	0.04219	l/s
Average Hour Demand (24hr Day)	0.01406	l/s

6.2. WATER SUPPLY

A existing connection for each unit to the existing public main is being maintained.

7. FLOOD RISK ASSESSMENT

Historic Flood Events.

Historical flood events have been researched with reference to an online Office of Public Works database, www.floodmaps.ie. A summary report generated from www.floodmaps.ie is contained within Appendix. The report indicates site has not flooded.

CFRAMS flood hazard risk maps for the adjacent river have been researched with reference to an online Office of Public Works database, http://maps.opw.ie/floodplans/fhr_map/

Currently there are is no Flood data available for the site, however surrounding site data has been used for reference. Appdendix

Figure 1: Historic flood events (Source: floodmaps.ie)

1/100yr flood risk (1% AEP)

Reference to the fluvial flooding CFRAMS maps indicates the site does not flood

1/1000yr flood risk (0.1% AEP)

Reference to the fluvial flooding CFRAMS maps indicates the site does not flood

8. CONSTRUCTION MANAGEMENT PLAN

General

This section has been included to outline the intended strategy for the management of the construction works on site. Once appointed, the contractor will prepare a more detailed Construction Management Plan. In advance of the works commencing. This may be updated throughout the construction phase, as required.

Construction Programme and Phasing

Following publication of the scheme under part 8, it is intended that the works would commence in December 2024. The proposed development is anticipated to be constructed over a 12-15 month period

The anticipated construction sequence for the building is as follows:

1 Clearance of existing vegetation on site

2 Set up site perimeter and contractor's site compound

3 Localised re-grading of the ground to facilitate access for construction machinery

4 Demolition of existing concrete walls & break out of slabs

5 Excavations for new building foundations

6 Construction of building foundations and rising walls to ground level, with back-filling

below ground floor level, as required

6 Construction of remainder of the new building extension and connect all services

7 Installation of finishes and internal elements to new building

8 External landscaping and construction of hard-standing areas

8.1. Site Establishment

Excavations

Prior to excavation, the Contractor shall accurately locate and verify all existing services.

It is proposed that excavations are generally battered-back to a 45 degree angle with trench boxes shall be used for deeper excavations.

It is not proposed that any significant de-watering will be required on site. However, localised pumping from deeper excavations for foundations may be required.

Fencing

Temporary fencing around the site will be required to maintain site security during the construction phase. It is envisaged that this will be Heras fencing or solid timber hoarding 2m high.

Site Access And Contractor's Compound

It is indicatively proposed that the contractor's compound and storage area could be located in the northern corners of the site. However, the site compound may need to be relocated a number of times as works progress.

It is proposed that the contractor would make a temporary connection to the Irish Water mains water supply to serve the compound during the construction works. As there is a foul sewer MH adjacent to the site area, the contractor shall manage the temporary disposal of wastewater through the connection to the existing sewer line.

Temporary access routes and hard-standing areas will be required to provide trafficable routes around the site.

The appointed contractor shall use the existing site entrances off Glenamuck Road as the site access points during construction. The appointed contractor will determine the exact location for compound location and on-site temporary roads to suit their construction programme and methodology.

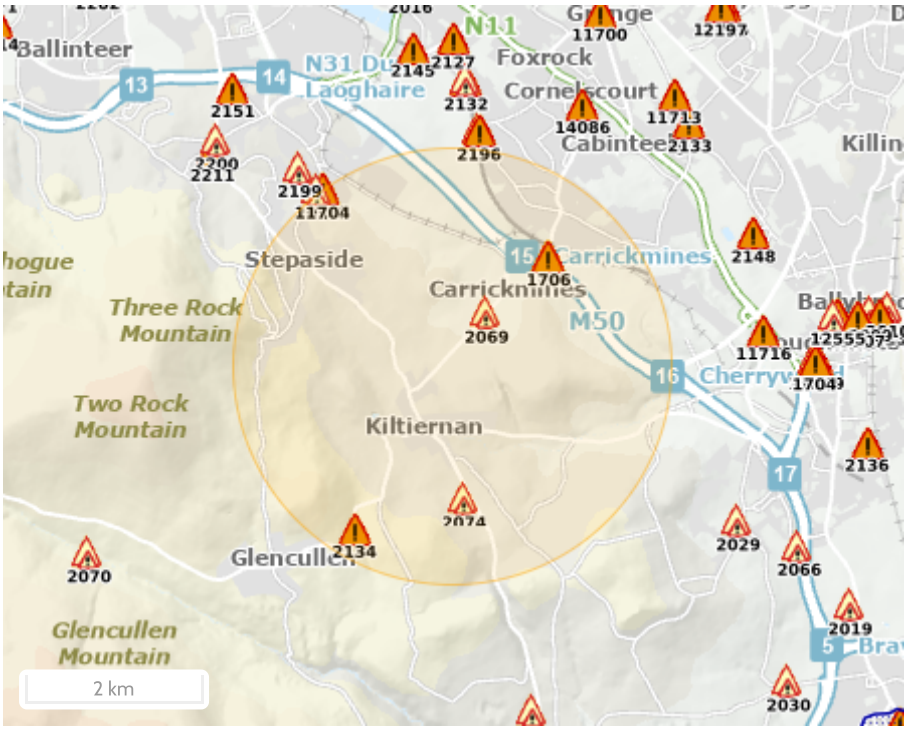
Appendix

Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poiblí Office of Public Works

Report Produced: **11/6/2025 15:00**

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



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

9 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Flooding at Clonskeagh Road, Dublin 6 on 24th Oct 2011 (ID-11704) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
2.	Flooding at Kilgobbin Road, Stepaside, Co. Dublin on 24th Oct 2011 (ID-11712) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Exact Point
3.	Shanganagh Carrickmines Nov 1982 (ID-1706) **Additional Information:** Reports (3) Press Archive (0)	06/11/1982	Approximate Point
4.	Shanganagh Carrickmines May 1993 (ID-1707) **Additional Information:** Reports (7) Press Archive (0)	25/05/1993	Approximate Point
5.	Shanganagh Carrickmines Dec 1997 (ID-1708) **Additional Information:** Reports (1) Press Archive (0)	18/12/1997	Approximate Point
6.	Kilternan Glencullen Road Nov 1982 (ID-2134) **Additional Information:** Reports (1) Press Archive (0)	05/11/1982	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
7.	 Enniskerry Road Recurring (ID-2074)	n/a	Exact Point
	Additional Information: Reports (2) Press Archive (0)		
8.	 Glenamuck Stream Glenamuck Road Recurring (ID-2069)	n/a	Exact Point
	Additional Information: Reports (2) Press Archive (0)		
9.	 Shanganagh Carrickmines Nov 2002 (ID-1703)	26/11/2002	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		