

**M.E.R.I.T.S Office Development, Devoy Park,
Naas, Co. Kildare.**

INFRASTRUCTURE DESIGN REPORT

February 2018



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1.0 INTRODUCTION

1.1 Background

DBFL Consulting Engineers (DBFL) have been commissioned to provide engineering services for a proposed office development on lands located at Devoy Park, Naas, Co. Kildare.

The subject proposals seek permission for the development of a new two storey Mid Eastern Region Innovation Think Space (MERITS) with a proposed new car park and all associated site works adjoining the existing overflow carpark of Kildare County Council's Áras Chill Dara.

1.1.1 This Infrastructure Design Report aims to consider the proposed development's main infrastructure elements, including the following:

- Development layout design and levels.
- Surface Water Strategy and design including provision of SUDS.
- Foul Sewer design.
- Water main design.
- Access design and Traffic.

2.0 SITE LOCATION & TOPOGRAPHY

2.0 Existing Site Characteristics

2.0.1 The subject site consists of part of the existing overflow car park and adjoining green field site to the west of Áras Chill Dara, Devoy Park, Naas, Co. Kildare. The subject site is bounded to the north by existing industrial buildings within the Military Road Industrial Park. To the east the site is bounded by the Áras Chill Dara overflow car park and the remaining perimeter is bounded by green fields. The site is characterised by its gradual sloping topography which falls in a south-eastern direction at an average gradient of approximately 1 in 30.

Figure 2.1 shows the extent of the subject site.

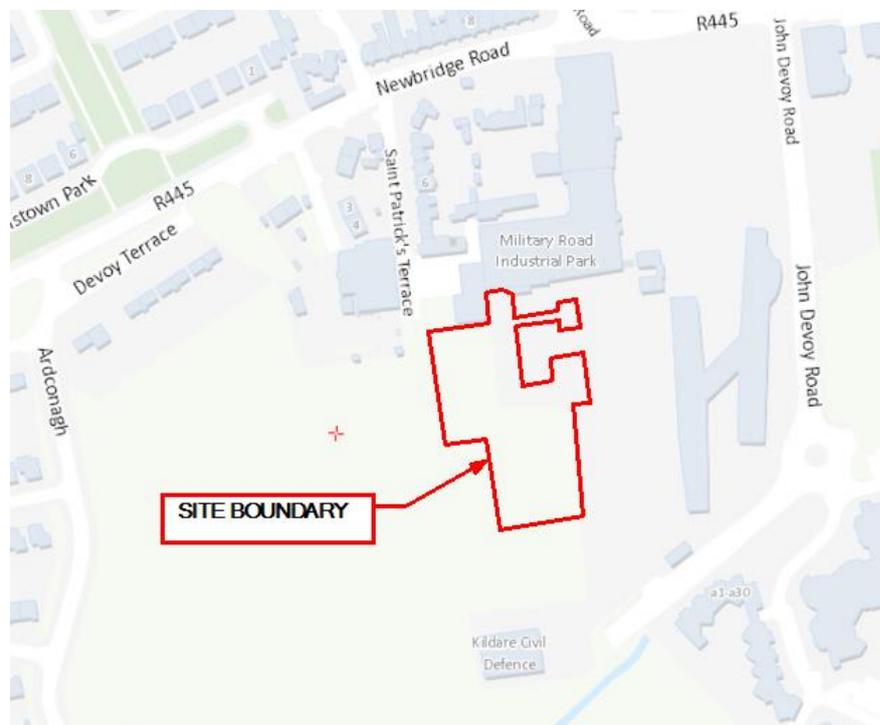


Figure 2.1: Site location plan with indicative site boundary (Source: Osi.ie)

2.1 Flood Risk

- 2.1.1 Consultation of flood information from the OPW's floodmaps.ie website indicates that the site has not been subjected to flooding in the past.
- 2.1.2 Further consultation of the OPW's Eastern CFRAM flood risk map, available at www.cfram.ie, indicates that the site is located in Flood Zone C and is not at risk of fluvial flooding. It is therefore suitable for office development.
- 2.1.3 Section 5 of this report details how the storm-water drainage system has been designed in accordance with the GSDS recommendations for pluvial storm events up to the 1 in 100 year event. Given the capacity of the drainage network there is low flood risk to the proposed development. Further, the proposals do not impact flood risk to the adjacent properties.

3.0 ROAD NETWORK

3.0 Access and Internal Road and Pedestrian Facilities

- 3.0.1 Roads and footpaths are designed in accordance with the principles and methods set out in DMURS.
- 3.0.2 The proposed MERITS development will be accessed via the existing Áras Chill Dara car park and will therefore use the existing vehicle access off the John Devoy Road.
- 3.0.3 A new entrance from the existing Áras car park into the MERITS site is proposed. It is proposed to rationalise the existing access and egress arrangement serving the overflow car park by providing a shared 6.0m wide access. See Drawing 170225-2000 for details.
- 3.0.4 Within the proposed car park internal circulation aisles are provided at 6.0m wide.
- 3.0.5 A 5.0m wide fire tender access is provided to 15% of the proposed MERITS building and vehicle tracking has been used to evaluate the route from John Devoy Road to the MERITS Building.
- 3.0.6 Pedestrian access to the MERITS site is provided via the Áras Chill Dara site and it's established pedestrian links with Naas town centre. It is proposed to provide a pedestrian link extending the existing Áras Chill Dara pedestrian facilities to meet the MERITS site. Footpaths are provided at 1.8-2.5m wide. See Drawing 170225-2000 for details.

3.1 Vehicle Tracking

The proposed road layout and hard landscaping areas have been tracked to demonstrate that the site's proposed corner radii and turning heads will accommodate vehicles such as normal delivery and fire tenders.

It is proposed that the proposed development will share the existing Áras Chill Dara refuse collection point.

3.2 Pavement Design Standards

Road construction details for the car park works are provided on DBFL Drawing No. 170225-2000. Road construction will generally match existing road construction layers thicknesses subject to assessment of ground conditions and design in accordance with the Department of the Environment Recommendations for Site

Development Works, the Design Manual for Urban Roads and Streets (DMURS) and Local Authority requirements.

Proposed road construction materials and thicknesses are based on an expected minimum subsoil CBR of 2.5% at road formation level to be confirmed by the site investigation. Further CBR values and assessment of ground conditions will be undertaken by additional site specific investigations prior to construction stage.

3.3 Proposed Parking

The MERITS development will provide 55 car parking spaces and will relocate 36 existing spaces from the Áras Chill Dara car park. In total 91 spaces are proposed within the subject site. These spaces will include mobility impaired parking bays and cyclist parking. A number of these are provided as electric car charging points in line with the Development Plan requirements.

Additional motorcycle parking spaces, 3 nr, are also provided.

The design provides a total of 26 covered bicycle spaces in proximity to the building. This quantum is in accordance with the Kildare County Council Development Plan 2017-2023 for the size of building.

Parking Calculation					
Development Type	Area m ²	Car Parking		No. of car parking spaces	No. of cycle spaces
		Development Standards	Cycle Parking Development Standard		
Conference area/function room with break room	146	1/10m ² gross floor area	1/50m ² gross floor area	15	3
Office Town Centre	1019	1/30m ² gross floor area	1/50m ² gross floor area	34	20
Café	68	1/10m ² gross floor area	1/30m ² gross floor area	7	2
Total number of spaces provided				55	26
Number of disabled spaces at 5% of spaces provided				3	
Number of charging stations/spaces at 10% of spaces provided				6	

Table 3.1 Parking provision calculation as per Table 17.9 & Table 17.10 of the Kildare County Council Development Plan 2017-2023

4.0 FOUL SEWERAGE

4.0 General

4.0.1 The proposed development consists of 1 office building with a normal occupancy of 100 people. It is proposed to connect the subject application's foul network to the 300mm diameter public sewer in the Newbridge Road via the existing Áras Chill Dara foul network.

4.1 Proposed Foul Layout

4.1.1 The foul sewer drainage system is designed to service the proposed development. Servicing the proposed development will involve the laying of a new 100mm diameter foul sewer along the building perimeter as well as the laying of a new 150mm diameter foul sewer traversing the Áras Chill Dara overflow car park and connecting into the existing foul manhole and 150mm diameter foul spur.

4.1.2 The system is designed to drain by gravity and will discharge to the existing 150mm diameter sewer located in the Áras Chill Dara car park and out falling to the 300mm diameter public sewer in the Newbridge Road. This in turn discharges to the Osberstown Waste Water Treatment Plant. Details of the proposed foul sewer system and connection are provided on drawing 170225-3000.

4.2 Foul Sewer Design Standards

All new main foul sewers are designed to discharge by gravity. Minimum gradients and pipe diameters for collector and main sewers are designed in accordance with the Building Regulations and Irish Water's Code of Practice for wastewater infrastructure and Standard Details for wastewater infrastructure and also have been designed in accordance with the principles and methods set out in IS EN 752 (2008), IS EN12056: Part2.

Estimated foul loadings from the development are outlined in below.

PREDICTED SITE FOUL FLOWS						
Source	Floor Space (m ²)	Occupancy Rate	PE	Flow (l/day/person)*	Flow (l/day) (DWF)	Peak Flow (l/s) (6*DWF)
1 no. Office Blocks	1357	1 per 20m ²	68	40	2720	0.189
Total Daily Flow (m ³ /day)					2.72	-
Daytime Peak Flow (l/s)						0.2
*Flow rates extracted from EPA Wastewater Treatment Manual						

5.0 SURFACE WATER DRAINAGE

5.0 Surface Water Policy

5.0.1 The site's proposed surface water will be managed to comply with the policies and guidelines outlined in the Greater Dublin Strategic Drainage Study (GDSDS) and with the requirements of Irish Water & Kildare County Council. The guidelines require the following main measures to be provided by the design;

- Sustainable Urban Drainage Systems (SUDS).
- Surface water attenuation by restricting discharge from the site e.g. by means of a flow control device.
- Surface water design to accommodate rainfall events up to a 100 year return event.
- Climate change allowance.

5.1 General Design

5.1.1 It is proposed to use a sustainable urban drainage system (SUDS) approach to storm water management within the development in compliance with the requirements of the GDSDS.

5.1.2 Surface water from the site will be attenuated on site before diffusing to the existing Áras Chill Dara surface water system via fin drains with diffuser boxes bridging the stone layers from the existing permeable paved car park and the proposed permeable paved car park and swale. Refer to drawing 170225-3000 for details.

5.1.3 Internal SUDS solutions include the following;

1. Extents of impermeable areas reduced where allowable.
2. Permeable, self-draining areas incorporated in landscaped areas.
3. Swales and bioretention areas shall be provided to attenuate flows and provide first flush infiltration and evapotranspiration.
4. All new parking and road ways to be constructed using permeable paving. Run-off from these permeable areas is allowed to infiltrate to the stone layers and provide attenuation, storage and soakage for run-off generated

by adjacent impermeable surfaces. This will provide a first flush of filtration of any pollutants.

5. Footpaths to direct run-off into the adjacent grass verge or permeable paving where possible for infiltration, attenuation and storage.

5.1.4 It is proposed to install a 10m³ rain water harvesting tank to collect, filter and reuse roof water with an overflow pipe from the rain water harvesting tank entering the surface water system via the proposed swale.

6.0 WATER SUPPLY

6.0 Proposed Water Services

- 6.0.1 The looped 150mm diameter watermain system for the proposed development will connect to the Áras Chill Dara supply via the 180mm diameter watermain located parallel to the Áras Chill Dara building, refer to drawing 170225-3000.
- 6.0.2 The connection to the proposed development will be a metered connection and sluice valves will be positioned to facilitate normal operating practices.
- 6.0.3 It is proposed to provide 2 new hydrants to service the development.