

PROPOSED LOCAL DAY CARE CENTRE
AT 61 DUBLIN ROAD, SWORDS, CO. DUBLIN
FOR ST. MICHAEL'S HOUSE

SITE SERVICES REPORT: PLANNING STAGE

22nd JULY, 2021

Proposed Local Day Care Centre
at 61 Dublin Road, Swords, Co. Dublin
for St. Michael's House

Site Services Report – Planning Stage

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1.0 Introduction.

1.1 Site Location Details.

The subject site, known as No.61 Dublin Road, Swords, Co. Dublin, occupies an area of approximately 1680.0 sq. metres (0.168 Hectares). The Ordnance Survey Reference No. is 2994-08. The Irish National Grid coordinates are 717892, 746004.

The site is bounded to the north by No.59 Dublin Road (which is also a Day Care Centre for St. Michael's House), to the south by existing woodland, to the east by the Carlton Court housing estate and to the west by Dublin Road, Swords (R836). See Ordnance Survey Map attached at Appendix 1 to this Report.

1.2 Description of Proposed Development.

The proposed development on this site will include the demolition of an existing single-storey structure to the side of the existing house (i.e. No.61), construction of a new single-storey extension to the rear and construction of a new two-storey building to the side.

Ancillary works will include the construction of a car park with 10no. car parking spaces, including 1no. wheelchair accessible spaces. Additional set-down areas will also be provided to the front of the existing building and proposed new building.

Other ancillary works will include the construction of a new foul drainage system and a new surface water drainage system. The foul and surface water systems have been designed as separate systems. With regard to drainage services, it is proposed to connect the new foul drainage system serving the extended Day Care Centre into the existing mains public foul sewer along Dublin Road (R836). It is proposed to connect the new surface water system serving the extended Day Care Centre into a new on-site underground soakaway chamber. This soakaway chamber will be fitted with a high-level overflow to a filter drain which will extend along the length of the car park.

Sustainable urban drainage systems are to be adopted, wherever practicable. Surface water management measures are being implemented to deal with the surface water run-off generated by the impermeable surfaces (i.e. roofs) at the subject site.

2. Foul Drainage Services.

2.1 Occupancy Levels.

The schedule of occupancy for the proposed Local Day Care Centre is as follows:

No.61 (existing):	9no. Service Users 11no. Staff Members
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Proposed Day Centre:	21no. Service Users 10no. Staff Members
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Total No. of Persons: 51no.

2.2 Wastewater Loading.

With regard to the calculation of wastewater loading for the proposed Day Care Centre (including the existing Day Care Centre at No.61), we have referred to Table 3 of the EPA Wastewater Treatment Manual (Treatment Systems for Small Communities, Business, Leisure Centres & Hotels). We have also referenced the Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03). See Irish Water Wastewater Flow Rates for Design at Appendix 2 to this Report. As the Irish Water wastewater flow rates for design are more onerous, the following wastewater loading level has been adopted.

Non-Residential School w/ Canteen Cooking on Site = 90.0 litres/person/day

Total Wastewater Hydraulic Loading
= (51x90) = 4,590.0 litres per day.

For a single person (per capita) wastewater flow, we have taken the Irish Water recommended figure of 150.0 litres per person per day as our baseline hydraulic loading. See Appendix D, IW-CDS-5030-03. Based on this figure, we calculate the proposed total foul hydraulic loading in PE at 31.0 (i.e. 4,590/150).

2.3 Foul Drainage Services.

There is an existing 300mm diameter foul sewer along Dublin Road (R836). For details of the existing public main foul drainage services, see the local area drainage map, as received from Fingal County Council, attached at Appendix 3 to this Report.

It is proposed that the foul drainage system for the proposed development will be a closed, gravity system. For details of the foul drainage layout for the proposed development, see Drawing No.20-085-01(B). It is proposed that the new private foul drain serving the proposed Day Care Centre development will be connected to the existing public sewer along Dublin Road (R836) by means of a saddle connection (or other connection, as agreed with Irish Water). The nearest manhole on the main sewer to the subject site is Manhole No.SO1745990 (Cover Level +29.87, Invert Level +27.18). It is proposed to construct an outfall manhole inside the site boundary adjacent to the location of the saddle connection for maintenance and access purposes. All works on the mains foul sewer are to be carried out to Irish Water standards. The final outfall manhole (FMH.5) is to be fitted with an approved interceptor trap.

It is proposed to construct separate foul and surface water drainage systems to service the proposed Day Care Centre development, with separate outfalls to the respective public foul and surface water drainage systems. Therefore, no foul water is to discharge to the surface water drainage system.

Private drains within the curtilage of the site will consist of minimum 100mm & 150mm diameter uPVC pipes to IS123 and will be laid at a self-cleansing gradient (minimum of 1:100). All drains passing within the curtilage of the building will be encased in 150mm thickness of concrete all around. All foul manhole chambers are to be constructed as watertight chambers in order to prevent the ingress of groundwater into the foul drainage system.

The construction of the new foul drainage installation will comply with the 'Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0, April 2006'.

2.4 Foul Drainage Pipe Design.

Total Wastewater Loading = 4,590 litres per day

1 DWF = 0.053 litres per second

6 DWF = 0.320 litres per second

Design Wastewater Loading (6DWF) = 0.320 litres per second.

2.5 Construction.

As stated previously, it is proposed to construct separate foul and surface water drainage systems on site with separate outfalls to the respective foul and surface water drainage systems. Therefore, no foul water will discharge to the public surface water drainage system.

It is proposed that a new connection will be formed to the public foul sewer located along Dublin Road, Swords (R836) to service the proposed Day Care Centre. This new connection will be carried out in accordance to Irish Water and Fingal County Council specifications. For details of the proposed connection to the mains foul sewer, see Drg. No. 20-085-01(B). See the local area drainage map attached at Appendix 3 to this Report for details of the existing public sewer network.

The construction of the new foul drainage installation will comply with the 'Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0, FCC April 2006'.

2.6 Foul Drainage Reference Documents.

1. Recommendations for Site Development Works for Housing Areas, November 1998, (Dept. of Environment & Local Government).
2. Wastewater Treatment Manual - Treatment Systems for Small Communities, Business, Leisure Centres and Hotels, 1999 (Environmental Protection Agency).
3. Greater Dublin Strategic Drainage Study, Regional Drainage Policies - Technical Documents, March 2005.
4. Greater Dublin Regional Code of Practice for Drainage Works.
5. Part H of The Building Regulations.
6. Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03)

3. Surface Water Drainage Services.

3.1 Surface Water System Design.

There are 3no. surface water sewers shown on the area services map in the vicinity of the subject site. One of these is listed as a 100mm diameter pipe crossing the Dublin Road (R836) and terminating at an 'outfall' at the southern boundary of the subject site. Another is listed as a 225mm diameter pipe, which starts south of the subject site towards the Pinnockhill road junction. The third is listed as a 900mm diameter pipe running along the Dublin Road (R836). See the local area drainage map, as received from Fingal County Council, at Appendix 3 to this Report.

It is proposed that the on-site surface water drainage system for the proposed Day Care Centre development will be a closed, gravity system. For details of the surface water drainage layout for the proposed Day Care Centre development, see Drawing No.20-085-01(B).

It is proposed to construct separate foul and surface water drainage systems to serve the proposed Day Care Centre development, with separate outfalls to the respective foul and surface water drainage systems. Therefore, no surface water will discharge to the public foul sewer system.

The surface water drainage installation will comply with the 'Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0, FCC April 2006'. The construction of the surface water drainage installation will comply with the 'Greater Dublin Regional Code of Practice for Drainage Works, Version 6.0, FCC April 2006'.

3.2 Design Rainfall Intensity & Pipe Design.

The surface water pipework system has been designed on the basis of a design rainfall intensity of 75.0mm per hour (Clause 1.1.3.2, TGD H).

3.3 Permeable & Impermeable Areas.

Total Site Area = 1,680 sq. metres (0.168 Hectares)

Impermeable (Roofs)	=	400.0 sq. metres.
Permeable (Grassed Areas, Porous Asphalt, Permeable Paving, etc.)	=	1,280.0 sq. metres.

3.4 Surface Water Drainage Pipe Design.

Maximum surface water design flow rate
= $400.0 \times 75.0 / (60 \times 60) = 8.33$ litres per second.

Capacity of 150mm diameter pipe @ 1:200 = 42.242 litres per second.

See attached extract from H.R. Wallingford "Tables for the Hydraulic Design of Pipes, Sewers and Channels". - Sixth Edition (Volume 1) attached at Appendix 4 to this Report.

3.5 Surface Water Drainage Reference Documents.

1. Recommendations for Site Development Works for Housing Areas, Nov.1998, (Dept. of Environment & Local Government).
2. Extreme Rainfall Return Period Table (Met Eireann).
3. Greater Dublin Strategic Drainage Study, Regional Drainage Policies. Technical Documents, March 2005.
4. Greater Dublin Regional Code of Practice for Drainage Works.

4.0 **Sustainable Urban Drainage Systems (SuDS).**

4.1 **Introduction.**

It is proposed that measures included in the Greater Dublin Strategic Drainage Study (GDSDS) for surface water management (i.e. SUDS – sustainable urban drainage systems) will be implemented as far as is practicable on this project.

It is proposed to keep the area of impermeable surfacing on site to an absolute minimum, so that the surface water run-off from impermeable surfaces will be kept to an absolute minimum. Accordingly, it is proposed that all pedestrian areas, patios, shared surfaces and car parking spaces will be constructed as self-draining permeable pavements (i.e. permeable paving & porous asphalt).

Permeable pavements allow rainwater to infiltrate through the surface and into the underlying stone sub-base layers. The water is then temporarily stored in the interstitial voids of the sub-base, allowing for initial storage before gradually infiltrating through to ground over a period of time.

It is estimated that, depending on weather conditions, up to 30% of surface water entering permeable pavement systems can be subsequently lost through evaporation and, therefore, does not leave the site in the form of exit water. An additional advantage of permeable paving systems is that water exiting such systems typically has a pH value of approximately 7.5. Rainfall typically has a pH value of approximately 4.5. The layers of stone and the geotextile membrane act as a form of trickle filter. Organic matter and silt is caught by the geotextile membrane and held within the laying course. Heavy metals have an affinity to particulates, adhering to the surface of the organic matter and silt. They are subsequently stabilised and retained within the sub-base. Hydrocarbons are digested within the sub-base by naturally occurring microbes. Research undertaken at Coventry University on microbial growth has shown that such systems are capable of degrading at least 70g of oil per square metre per annum.

It is proposed that the surface water run-off from the impermeable roof areas will be directed to an underground soakaway chamber. Soil infiltration tests were carried out on site by Mr. David Ryan of percolationtests.ie. The Percolation Test Report with site test results and the design of the soakaway chamber, as carried out by Mr. David Ryan of percolationtests.ie, is attached at Appendix 5 to this Report. For details of the incorporation of this soakaway chamber into the on-site surface water drainage system, see Drawing No. 20-085-01(B). It is proposed that the soakaway chamber will be fitted with a high-level overflow pipe. This pipe will be a 100mm diameter perforated pipe and will extend from the soakaway along the length of the rear car park to act as a filter drain. See Drawing No. 20-085-01(B).

To comply with the water quality enhancement requirements of the GSDSDS, the proposed system will be constructed as a permeable soakaway system. See Drg. No. 20-085-01(B) for details. As stated, the site specific surface water infiltration characteristics have been established by on-site testing by percolation tests. ie. Given the relatively small size of the site, the implementation of other SUDS measures, such as retention ponds and swales, is considered to be impractical.

The 2no. rainfall events considered in the design of the soakaway are the 30-year and 100-year storm events. Accepted SUDS practice requires the storage capacity for the 30-year storm event to be provided below ground. The additional surface water run-off generated by the 100-year storm event may be stored above ground level within the curtilage of the site. However, due to the relatively small size of this site, it is proposed to provide the additional storage capacity required for the 100-year storm event below ground level in the soakaway chamber

4.2 Rainwater Harvesting.

In order to facilitate the recovery and re-use of rainwater for gardening maintenance purposes, water butts have been specified at a number of rainwater downpipe locations. See Drawing No.20-085-01(B) for details.

4.3 Green Infrastructure.

The proposed Green Infrastructure for the subject site consists primarily of maximizing the area of permeable surfacing throughout the site. Permeable surfacing on site will consist of grassed areas, soft landscaped planters, permeable paving at patio areas, permeable footpaths, porous asphalt for car park access road, etc.

5. Mains Water Services.

5.1 Mains Water Supply, Storage & Fire-Fighting Services.

There is an existing 150mm diameter asbestos (1982) watermain along Dublin Road (R836) adjacent to the subject site. See Drawing No. 20-085-01(B). Also, see the local area water services map, as received from Fingal County Council, attached at Appendix 3 to this Report.

It is proposed that the extended Day Care Centre will be serviced by means of a new 20mm diameter MDPE supply branch connection to the mains watermain. It is proposed that the existing boundary box & water meter be utilised to service the extended premises in compliance with Irish Water standards.

We have referred to the Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03) with regard to rates for minimum cold water storage for the proposed Day Care Centre development. Based on Irish Water Wastewater Loadings for Design, the total daily mainswater demand loading = 4,590 litres per day.

The level of cold water storage required is based on the provision of adequate storage to cover twenty-four hours interruption of supply. The rates are also based on the use of low flush and dual flush w.c.'s.

There is an existing fire hydrant located in front of No.57 Dublin Road. This hydrant is located approximately 52.0 metres from the rear south-east corner of the extended Day Care Centre building. Therefore, it is proposed to provide a new fire hydrant in the public footpath adjacent to the subject site, so that no part of the premises is more than 46 metres from a hydrant. The hydrant location will be marked with a proprietary hydrant marker. See Drg. No. 20-085-01(B).

The mainswater pressure in the local water network is to be assessed on site. If necessary, a booster pump will be installed with associated break tank to comply with Irish Water standards.

5.2 Mains Water Reference Documents.

1. Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03)
2. CIBSE Guide.
3. BSRIA Rules of Thumb: 2003.
4. BS6700:2006.
5. Technical Guidance Document G

6.0 Roads & Traffic.

6.1 Sight Lines.

There are 2no. existing vehicular entrances at the subject site. It is proposed that one of these entrances will be used for the existing Autistic Spectrum Day Care Unit, which is accommodated in the existing bungalow at No.61 Dublin Road. The other entrance will be used for the proposed new building (which will accommodate the Local Day Care Centre) and the main car park. The main car park will be used by Staff and Visitors for both buildings.

It is proposed that access to Dublin Road, Swords (R836) from the subject site will be by means of direct access via the existing car park entrance at No.61 Dublin Road. See Drawing No.20-085-02(B).

It is essential that the geometric layout of a direct access entrance should provide visibility for Drivers exiting from the subject site, so that they can see other Road Users on Dublin Road (R836), Cyclists and Pedestrians in order to carry out their movements safely. It is also essential that there is adequate visibility for Drivers on Dublin Road (R836), Cyclists and Pedestrians approaching the site entrance. Visibility splays ensure that Drivers emerging from the subject site have adequate visibility in each direction in order to see oncoming traffic, Cyclists and Pedestrians in sufficient time to make their manoeuvre safely. Visibility splays also ensure that Drivers of vehicles on the main road, Cyclists and Pedestrians will have forward visibility in order to be aware of the presence of the subject site entrance. Visibility splays are applied to junctions where Drivers must use their own judgement as to when it is safe to enter the junction.

We have consulted the NRA Road Geometry Handbook, TD 41/95 (Vehicular Access to All-Purpose National Roads). Clauses 2.21 & 2.22 provide guidance on the design of appropriate visibility splays. These clauses provide guidance on the selection of an appropriate 'set-back' distance (X distance) and distance along the major road (Y distance) at an object to eye height of 1.05m to 0.60m. We have also consulted the Department of Transport, Tourism & Sport 'Design Manual for Urban Roads & Streets (DMURS)'. Clause 4.4.5 details the requirements for safe exit from the existing entrance and lists a maximum 'set-back' distance of 2.4 metres.

At a 'set-back' distance of 2.4 metres from the near-side road edge to the 'eye-point', the Driver should have an unobstructed visible line of sight of 49.0 metres both left and right of their vehicle on a road which is on a bus route and with a speed limit of 50.0 kmph. Ref. Table 4.2 (Reduced SSD Standards for application within cities, towns & villages).

For details of the proposed site entrance, sight lines and associated visibility splays, see Drawing No.20-085-02(B). It is noted that the removal of 3no. car park spaces north of the proposed site entrance would significantly improve the line of sight to the right on exiting the subject site.

In order to prioritise the safety of Pedestrians, it is proposed that the footpath pavement material (i.e. concrete) will be continued across the junction of the existing footpath with the car park entrance. This will serve to clearly indicate that Pedestrians have priority over vehicles at this interface. For details of the proposed road works at this location, see Drawing No.20-085-02(B).

6.2 Internal Parking & Circulation.

In accordance with Clause 2.7 of the DoE 'Recommendations for Site Development Works for Housing Areas', the parking area gradient has been set at less than 1:50 for the first 7.0 metres from the near-side road edge.

A total of 10no. off-street parking spaces, including 1no. wheelchair accessible space, are to be provided to serve the proposed Day Care Centre. Additional set-down parking will be provided at the front of the extended Day Care Centre. The layout of the parking is such that cars will be able to turn on site so as to exit the site in a forward gear.

6.3 Pedestrians.

At the proposed car park entrance, where vehicles will be entering and exiting across the public footpath, it is also essential that the geometric layout of the direct access junction provides visibility for Drivers so that they can see Pedestrians. It is also essential that there is adequate visibility for Pedestrians walking along the footpath approaching the proposed car park entrance.

The design of the vehicle crossover should clearly indicate that Pedestrians have priority over vehicles. There should be no use of asphalt at the crossover which would incorrectly indicate vehicular priority across the footpath. It is important that corner radii are minimized in order to reduce the speed of vehicles and improve inter-visibility between Users. In order to maintain Pedestrian priority at this location, it is proposed that the footpath will be continued across the entrance to the car park.

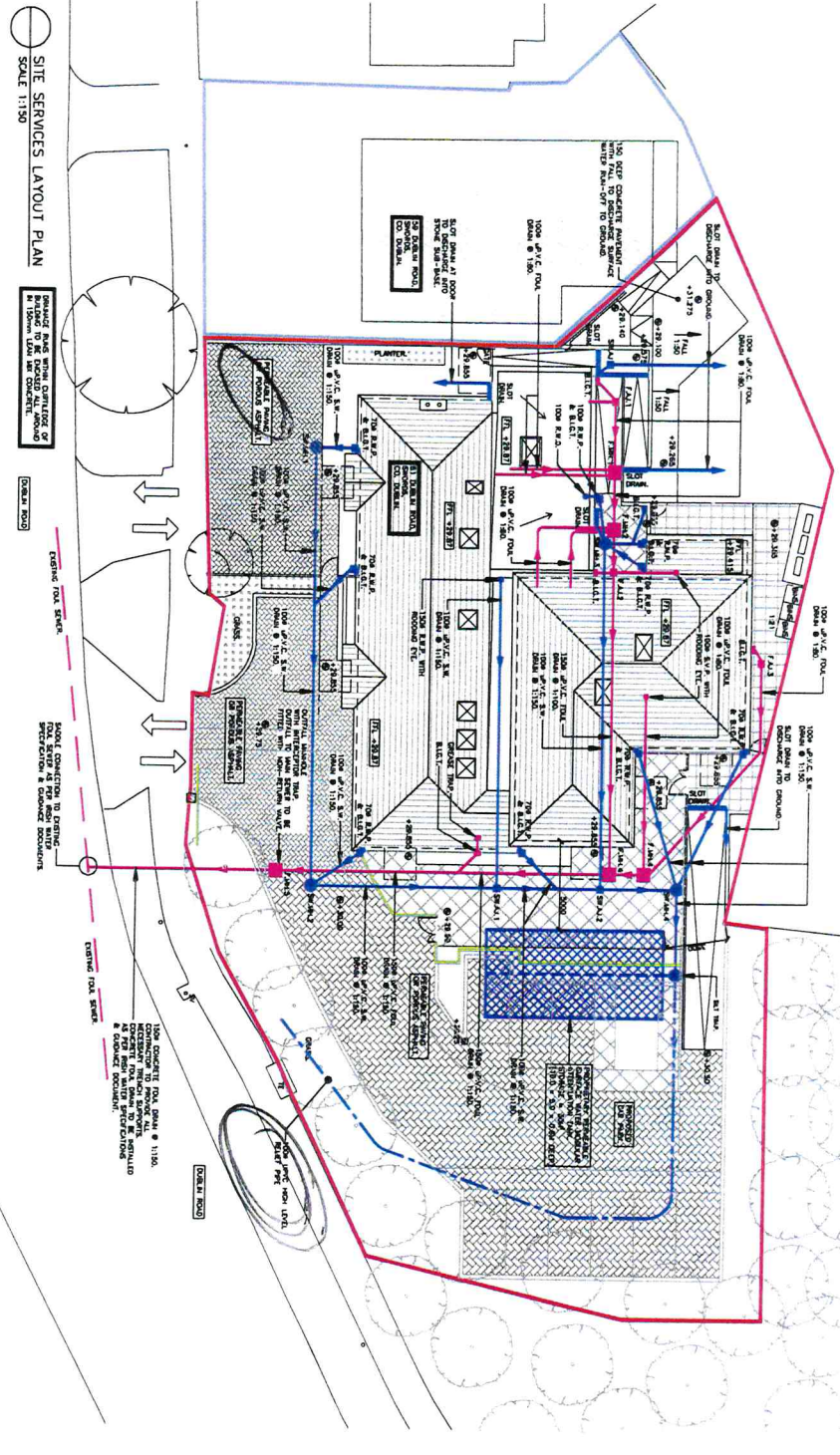
6.4 Roads & Traffic Reference Documents.

1. National Roads Authority (NRA) Road Geometry Handbook.
2. Department of Transport Traffic Management Guidelines.
3. Department of Environment Recommendations for Site Development Works for Housing Areas.
4. Department of Transport, Tourism & Sport 'Design Manual for Urban Roads & Streets (DMURS)'.

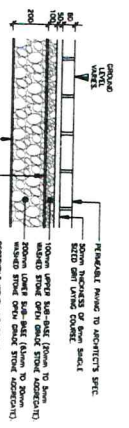
GENERAL SPECIFICATION NOTES

- 1. ALL WORKING TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS.
- 2. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED TO BE IN MILLIMETERS.
- 3. ALL DIMENSIONS TO FACE UNLESS OTHERWISE SPECIFIED.
- 4. ALL DIMENSIONS TO BE TAKEN FROM THE FACE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.
- 5. ALL DIMENSIONS TO BE TAKEN FROM THE FACE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.
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- 8. ALL DIMENSIONS TO BE TAKEN FROM THE FACE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.
- 9. ALL DIMENSIONS TO BE TAKEN FROM THE FACE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.
- 10. ALL DIMENSIONS TO BE TAKEN FROM THE FACE OF THE MEMBER UNLESS OTHERWISE SPECIFIED.

NO.	DESCRIPTION	DATE	BY	CHECKED
1	ISSUED FOR PERMITS	11/06/2021	E. DOYLE	M. KINANE
2	FOR EAMONN DOYLE	11/06/2021	E. DOYLE	M. KINANE
3	FOR EAMONN DOYLE	11/06/2021	E. DOYLE	M. KINANE
4	FOR EAMONN DOYLE	11/06/2021	E. DOYLE	M. KINANE
5	FOR EAMONN DOYLE	11/06/2021	E. DOYLE	M. KINANE



SITE SERVICES LAYOUT PLAN
SCALE 1:150



TYP. SECTION THRO' PERMEABLE PAVING BUILD-UP
SCALE 1:15

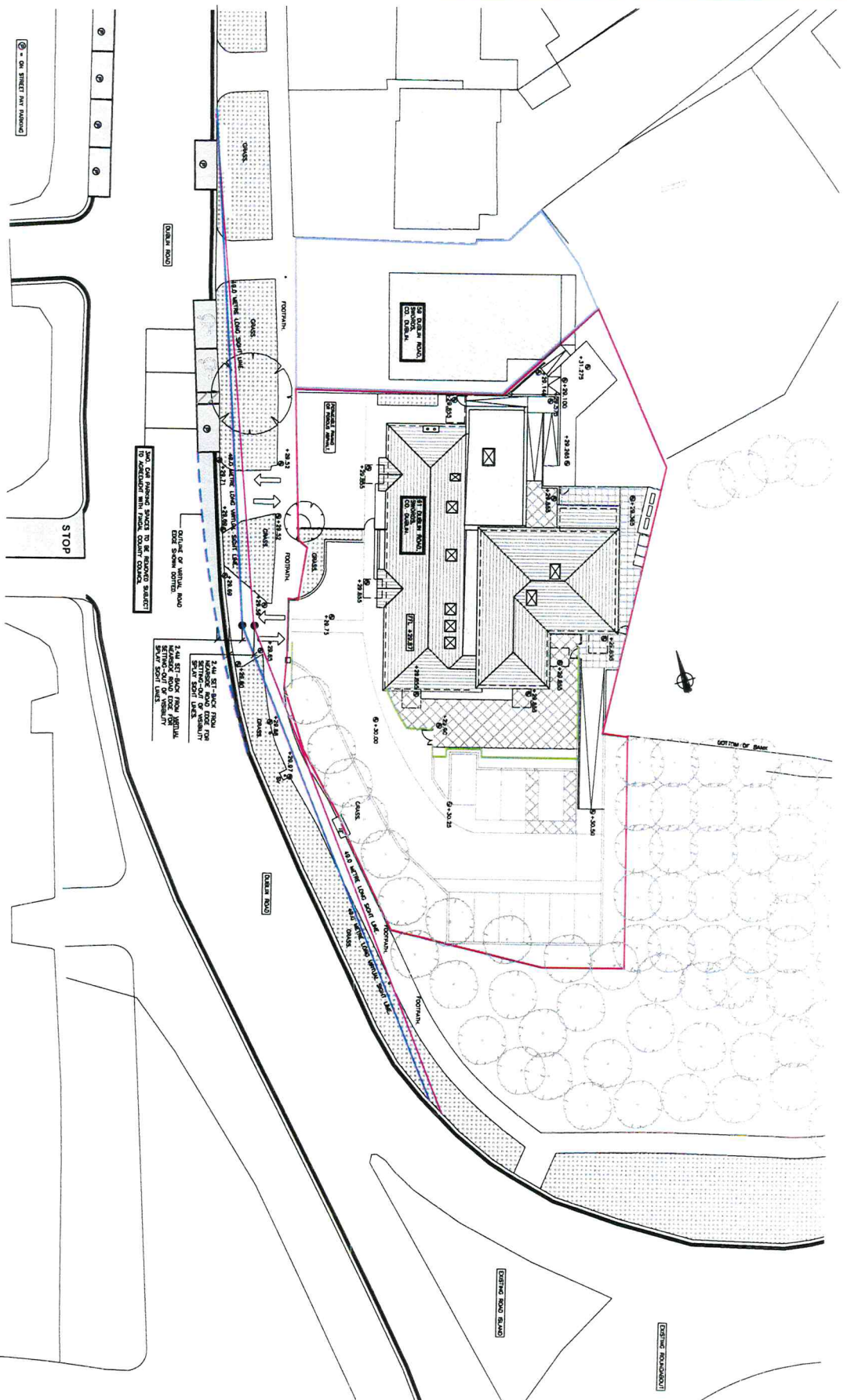
NO.	DATE	DESCRIPTION	BY	CHECKED
1	11/06/2021	ISSUED FOR PERMITS	E. DOYLE	M. KINANE
2	11/06/2021	FOR EAMONN DOYLE	E. DOYLE	M. KINANE
3	11/06/2021	FOR EAMONN DOYLE	E. DOYLE	M. KINANE
4	11/06/2021	FOR EAMONN DOYLE	E. DOYLE	M. KINANE
5	11/06/2021	FOR EAMONN DOYLE	E. DOYLE	M. KINANE

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CLIENT: ST. MICHAEL'S HOUSE
PROJECT: PROPOSED LOCAL DAY CARE CENTER FOR ST. MICHAEL'S HOUSE AT 61 THUNDER ROAD, SMOYDERS CO. DUBLIN
TITLE: SITE SERVICES LAYOUT PLAN
DATE: 11/06/2021

GENERAL SPECIFICATION NOTES

1. THE CLIENT HAS REVIEWED AND APPROVED THE DRAWING FOR CONSTRUCTION.
2. ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE DRAWING AND SPECIFICATIONS.
3. THE DRAWING IS TO BE USED AS A GUIDE ONLY AND NOT AS A CONTRACT DOCUMENT.
4. THE DESIGNER HAS CONDUCTED VISUAL IMPACT ASSESSMENTS AND ALL LEVELS SHOWN ARE RELATIVE TO DUBLIN HEIGHTS.



○ DR. STREET VIEW MARKING
 ○ SIGHT LINES, SITE ACCESS & ROAD MARKINGS
 SCALE 1:200

NO.	DATE	BY	DESCRIPTION
1	27.12.21	GENERAL DESIGN	IF 02
2	11.01.22	GENERAL DESIGN	IF 02
3	DATE	AMENDMENT	DN 100

CLIENT ST MICHAEL'S HOUSE
ARCHITECT MICHAEL MOHAN ARCHITECTS
PROJECT PROPOSED LOCAL DAY CARE CENTRE FOR ST MICHAEL'S HOUSE AT 61 DUBLIN ROAD SWORDS CO DUBLIN
TITLE CIVIL WORKS SHEET NO. 2 SIGHT LINES, SITE ACCESS & ROAD MARKINGS
JOB NO. 20-065 **SCALE** AS SHOWN
DRW. NO. 02 **DRAWN BY** K. DOLAN
REVISION B **CHECKED BY** E. DOYLE
DATE 11.05.2021 **NOT FOR CONSTRUCTION**

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PROPOSED LOCAL DAY CARE CENTRE
FOR
ST. MICHAEL'S HOUSE
AT
61 DUBLIN ROAD, SWORDS, CO. DUBLIN

SITE SPECIFIC FLOOD RISK ASSESSMENT REPORT
PLANNING STAGE

DATE: 22nd JUNE 2021

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1. **INTRODUCTION.**

At the request of St. Michael's House, Eamonn Doyle Associates was engaged to carry out a Site Specific Flood Risk Assessment as part of an application for planning permission for a development at 61 Dublin Road, Swords, Co. Dublin.

The purpose of this report is to assess the possible flood risk to the proposed development and also to assess the impact that this development may or may not have on the established hydrological regime of the area.

All quoted ground or estimated flood levels in this report are to be read with reference to Ordnance Datum Malin, unless stated otherwise.

This flood risk assessment has been carried out in accordance with 'The Planning System and Flood Risk Management - Guidelines for Planning Authorities' (Department of Environment, Heritage & Local Government (DEHLG) & Office of Public Works (OPW) and the 'Fingal Development Plan (2017-2023) – Strategic Flood Risk Assessment (SFRA)'.

2. **PROPOSED SITE DESCRIPTION**

2.1 **Site Location Description**

The subject site is located on the outskirts of Swords Village. The site occupies an area of approximately 1680 sq. metres (0.168 Hectares). It is located approximately 6.2km from the Irish Sea coast (Malahide) and approximately 2.1km from the Swords Estuary.

The Ordnance Survey Reference No. is O 17945 45993 (317945 Easting, 245993 Northing).

The site is bounded to the north by No.59 Dublin Road (which is also a Day Care Centre for St. Michael's House), to the south by woodland (which is to be partially cleared to construct an attenuation pond associated with proposed road alteration works at Pinnockhill), to the east by the Carlton Court housing estate and to the west by Dublin Road, Swords (R836).

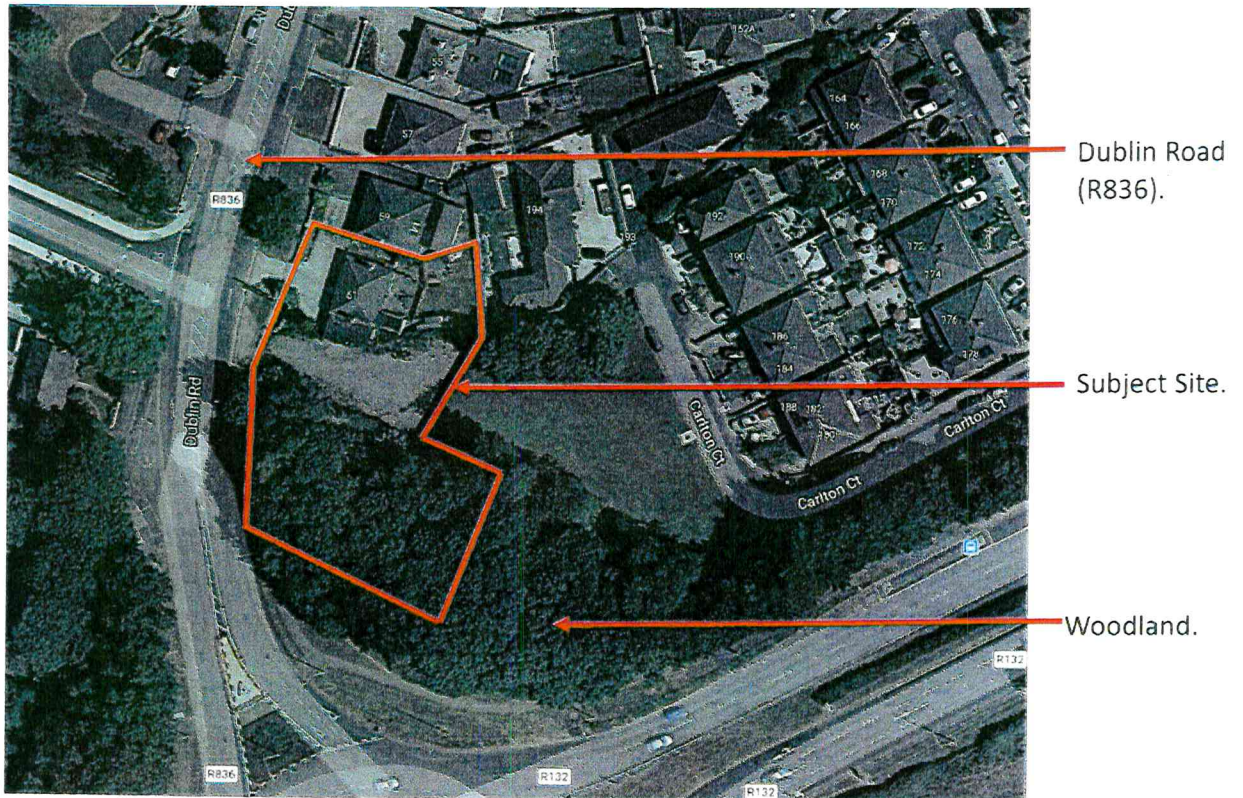


Figure 1 Site Location (Google Maps)

2.2 Description of Proposed Mixed-Use Development

The proposed development on this site will include the demolition of an existing single-storey structure to the side of the existing house (i.e. No.61), construction of a new single-storey extension to the rear and a two-storey building to the side.

Ancillary works will include the construction of a car park with 10no. car parking spaces, including 2no. wheelchair accessible spaces. Additional set-down areas will also be provided to the front of the existing building and the proposed new building.

Other ancillary works will include a new foul drainage system and a new surface water drainage system. The foul and surface water systems have been designed as separate systems. With regard to drainage services, it is proposed to connect the new foul drainage system serving the extended Day Care Centre into the existing mains public foul sewer along Dublin Road (R836). It is proposed to connect the new surface water system serving the extended Day Care Centre into a new underground soakaway chamber. This soakaway chamber will be fitted with a high-level overflow to a filter drain which will extend along the length of the car park. Sustainable urban drainage systems are being adopted, wherever practicable. Surface water attenuation measures are being implemented to deal with the surface water run-off generated by the impermeable surfaces (i.e. roofs) at the subject site.

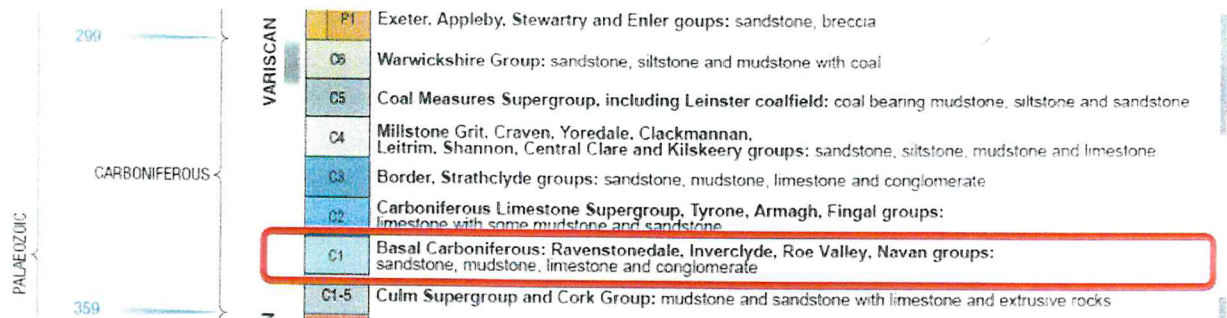


Figure 3 Legend for Bedrock Geology of Ireland (GSI)

3. FLOOD RISK ASSESSMENT

This flood risk assessment will assess all sources of flooding, including the effects of run-off from this development on flood risk both within the site boundaries and beyond the subject site.

A staged approach has been adopted in carrying out an assessment and appraisal at a site specific level. The stages of appraisal and assessment are;

- Stage 1: Flood Risk Identification.
- Stage 2: Initial Flood Risk Assessment
- Stage 3: Detailed Flood Risk Assessment

3.1 Stage 1: Flood Risk Identification

The purpose of this stage is to identify whether there may be any flooding issues relating to the subject site.

Table 1 Possible Types of Flooding at Subject Site

Source / Pathway	Significant	Comment / Reason
Tidal / Coastal	No	The subject site is located approximately (6.2km) from the Irish Sea coast (Malahide) and Swords Estuary (2.1km). The Ward River is not tidally influenced.
Fluvial	No	The subject site is located in close proximity (0.2km) to the Gaybrook Stream (North) to the south boundary and The Ward River (0.5km) to the Ward River to the north boundary.
Pluvial (Urban Drainage)	Possible	There is urban drainage and water supply infrastructure located in the vicinity of the site.
Pluvial (Overland Flow)	No	The site is not surrounded by significantly elevated lands and does not provide an important surface water discharge point to adjacent lands.
Groundwater	No	There are no significant springs or groundwater discharges mapped or recorded in the immediate vicinity of the site.

The primary potential flood risk to the subject site can be attributed to a potential surcharge of the urban drainage infrastructure within the vicinity of the site.

In accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authority – DOEHLG 2009', these potential flood risks are analysed in the subsequent 'Stage 2: Initial Flood Risk Assessment' and 'Stage 3: Detailed Flood Risk Assessment' sections of this study report.

3.2 **Stage 2: Initial Flood Risk Assessment**

The purpose of this stage of the assessment is to establish the level of flooding risk that may affect the subject site and to appraise the adequacy of the existing or historical information and data which may indicate the level or extent of any flood risk.

The following information and data was collated as part of the Initial Flood Risk Assessment for the proposed development site.

3.2.1 **OPW Website – Past Flooding Events**

The OPW Flood Maps Website (www.floodinfo.ie) was referred to in relation to past flooding events near the subject site. See Figure 4 below for location of prior flood events.

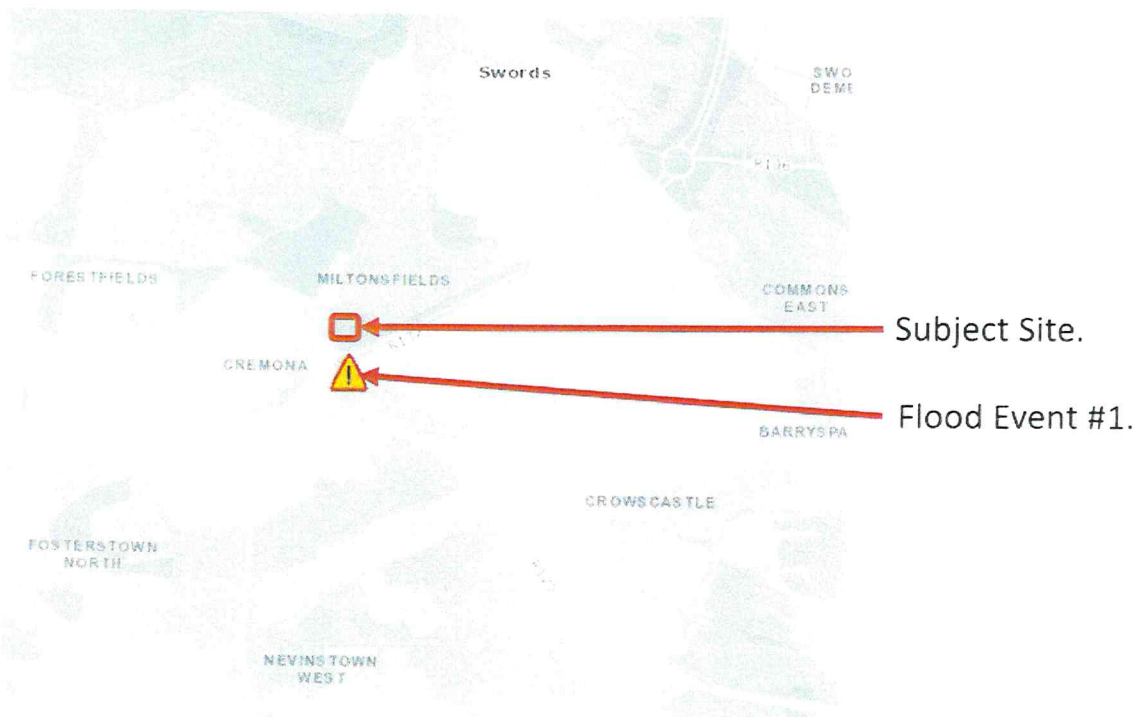


Figure 4 Reported Flood Events near Subject Site

Flood Event #1:

The reported flood name is names 'Pinnock Hill Swords Recurring' and there has been a total of 7no. reports uploaded to FloodInfo.ie. The first flood event in this location was recorded in 2001 and the last reported flood event was in 2005. Below is an extract from FloodInfo.ie of the last flood event report dated 5th of April 2005.

“Pinnock Hill, Swords (Flood ID No 2163, 1459, 1468) Flooding of N1 near ‘Little Chef’ Restaurant due to surface water drainage problems. Due to under capacity of surface water pipes. Impassable once (October 2002) (ref. Report on Flooding in Fingal, 2004, Report (B))”.

There has been no reported surface water flooding in this location since April 2005.

3.2.2 OPW Flood Maps Website – River Flood Extents

The OPW Flood Maps Website (www.floodinfo.ie) was referred to in relation to ‘River Flood Extents – Mid-Range Future Scenario’. The mid-range future scenario includes for modelled extents that take in the potential effects of climate change (increase in rainfall of 20% and sea level rise of 500mm). In reference to Swords Fluvial Extent Map No. E08SWO_DPFCD010_F1_34, the model indicates the subject site is outside the zone of mid-range flood extents. See Figure 5 below.

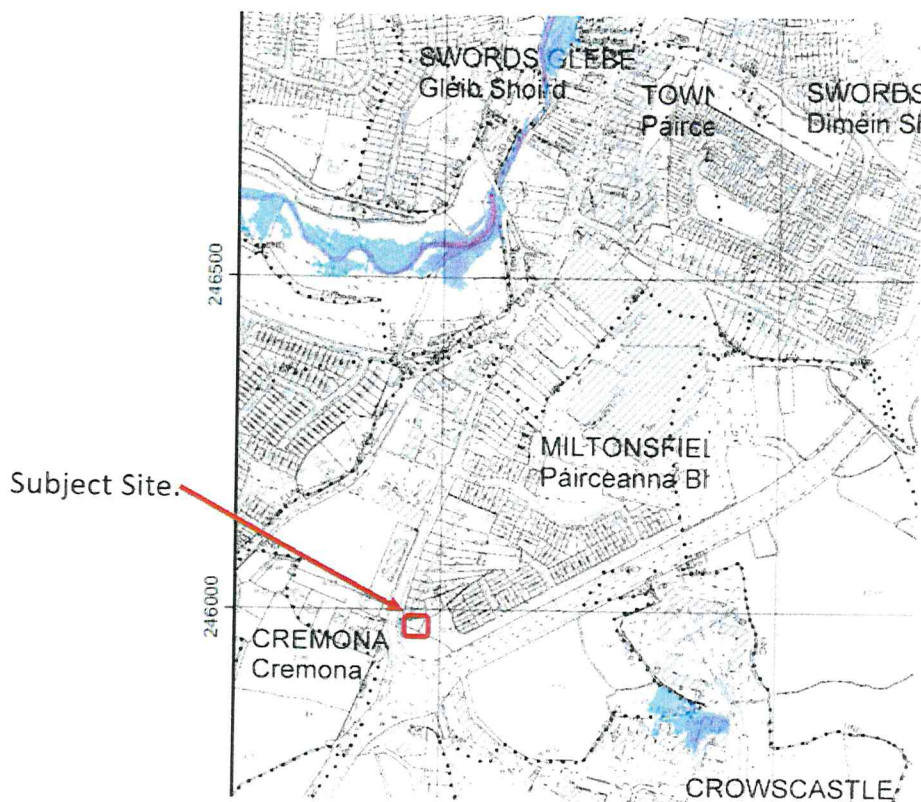


Figure 5 Extract from Flood Map No. E08SWO_DPFCD010_F1_34

3.2.3 Geological Survey of Ireland Mapping

The GeoURBAN viewer from Geological Survey of Ireland (GSI) website was used to assess the extent of any alluvial deposits in the vicinity of the subject site. Alluvial deposits can be an indicator of areas that have been subject to flooding in the recent

geological past. Surveys carried out in the general vicinity of the subject site suggest that the bedrock is between 5.0 to 10m below ground level.

3.2.4 Fingal East Meath FRAM Study - Fluvial

The Fingal East Meath FRAM Study was undertaken by the OPW and the final version of the flood maps were issued in March 2019. Flood risk extent and depth maps for further assessment areas within Dublin have also been produced. Swords Fluvial Extent Map No. E08SWO_EXFCD_F1_34 illustrates predictive extreme fluvial flood extent zones associated within the vicinity of the subject site.

Figure 6 below (extracted from Map No. E08SWO_EXFCD_F1_34), illustrates the predicted extreme 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) or 0.1% AEP (1 in 1000 year) flood extents in the vicinity of the subject site. The CFRAMS flood map also provides information on predicted flood levels and flood volumes for 10% AEP, 1% AEP and 0.1% AEP fluvial flood events at various node points.

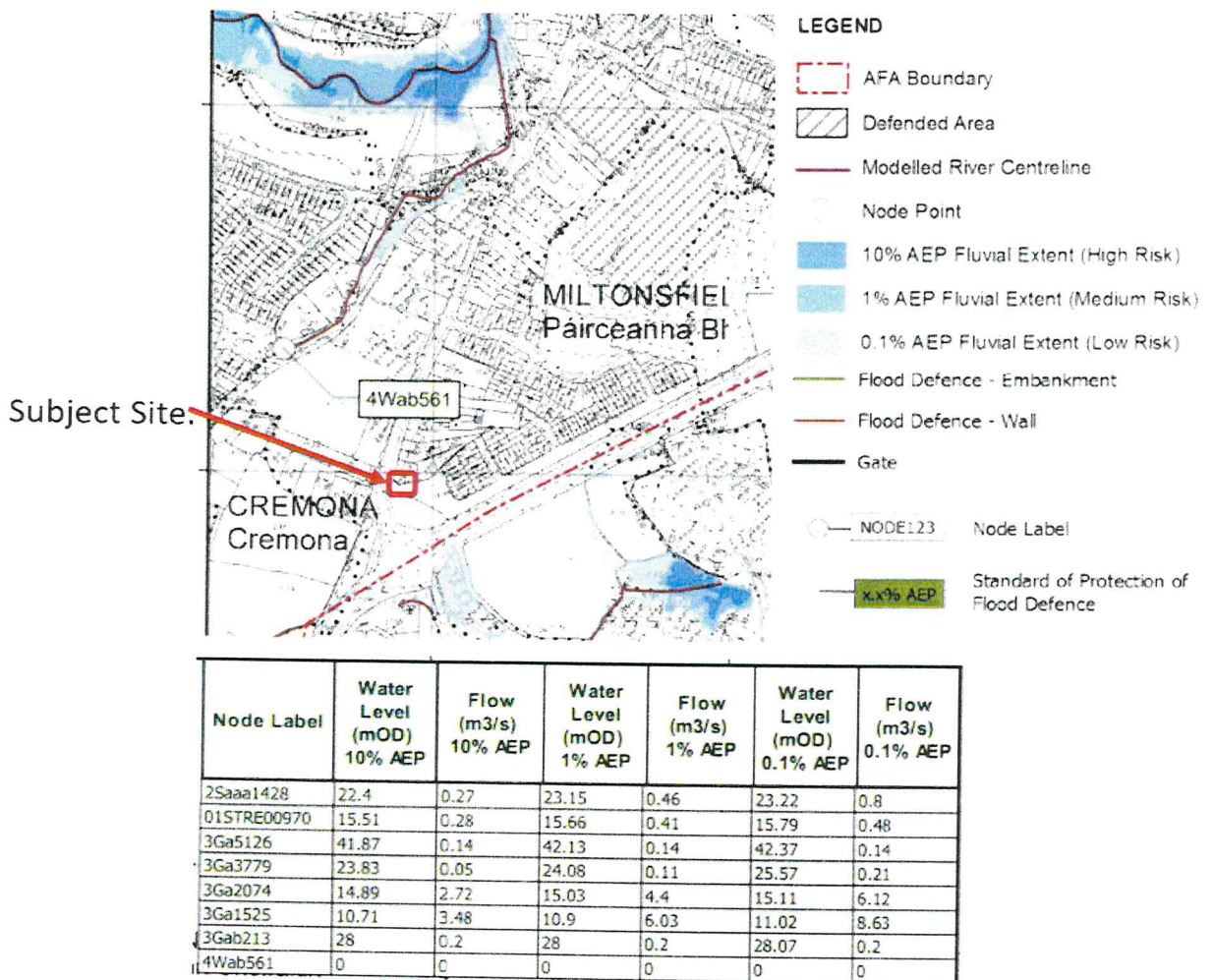


Figure 6 Extract from CFRAMS Flood Map No. e08swo_exfcd_f0-32

The map extract in Figure 6 indicates subject site is located outside the 10% AEP, 1% AEP and 0.1% AEP Flood Events.

3.2.5 Fingal East Meath FRAM Study - Coastal

The Malahide Tidal Flood Extent Map No. E09MAL_EXCCD_FO_35 illustrates predictive extreme coastal flood extent zones associated with the Ward River in the vicinity of the subject site (approximately 0.93km away - Swords Estuary).

Figure 6 below (extracted from CFRAMS Flood Map No. e09mal_exccd_f0_35), illustrates the predicted extreme 10% AEP (1 in 10 year), 0.5% AEP (1 in 200 year) or 0.1% AEP (1 in 1000 year) flood extents in the vicinity of the subject site.

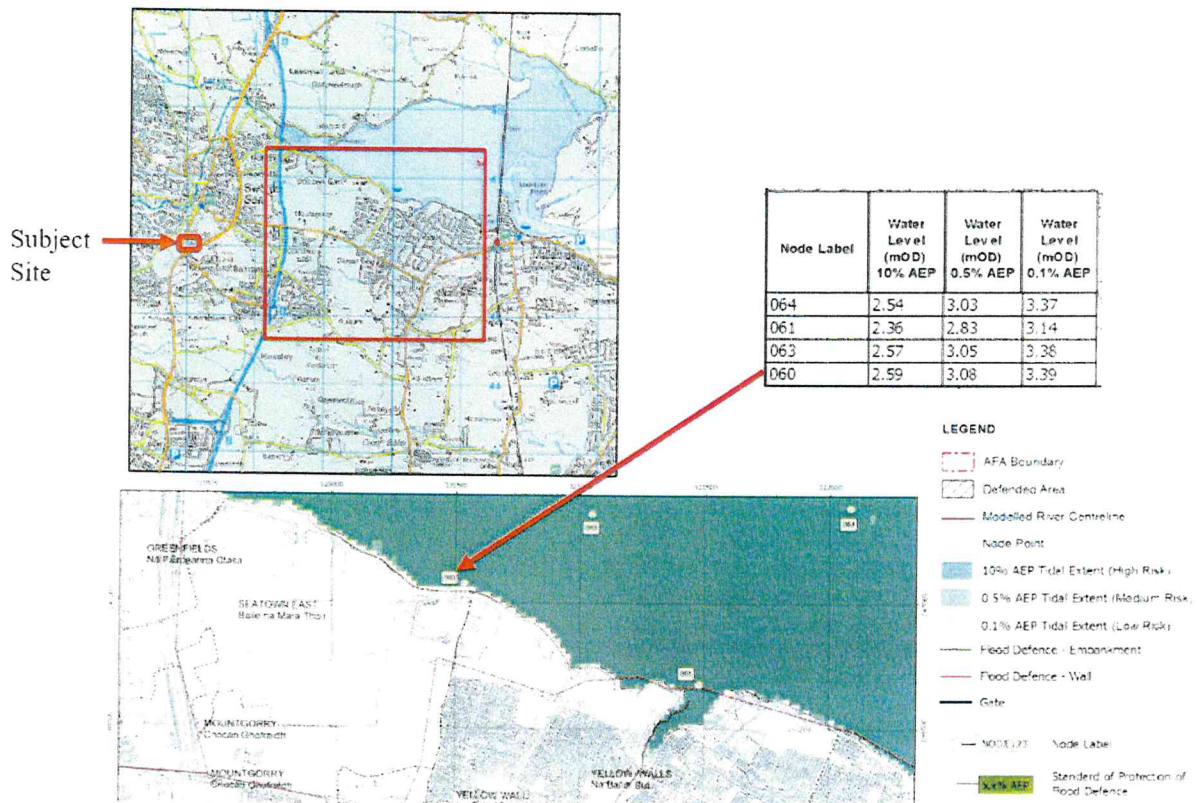


Figure 7 Extract from CFRAMS Flood Map No. e09rah_exccd_f1-01

The CFRAMS flood map also provides information on predicted flood levels and flood volumes for 10% AEP, 1% AEP and 0.1% AEP coastal flood events at various node points along the coastline in close proximity to the Ward River. The nearest node point to the subject site is referenced as node point 060 as illustrated in Figure 7 above. For the 0.1% AEP Event, node point 060 gives a water level of +3.39, which is significantly below the ground floor level of the proposed development of +29.87 AOD giving a freeboard of 26.48m.

3.2.6 Dublin Pluvial Study

The Dublin Pluvial Study was undertaken by the OPW and current scenario pluvial flood maps were issued in August 2016. Pluvial flood risk extent and depth maps for the Dublin environs have been produced. The subject site lies outside the boundary of

The Pluvial Study so there is currently no available map data for the greater Swords area.

3.2.7 Fingal Development Plan – Strategic Flood Risk Assessment (SFRA)

Figure 8 below, extracted from the Fingal Development Plan (2017-2023), illustrates the extents of strategic Flood Zones 'A' & 'B' in the vicinity of the subject site.

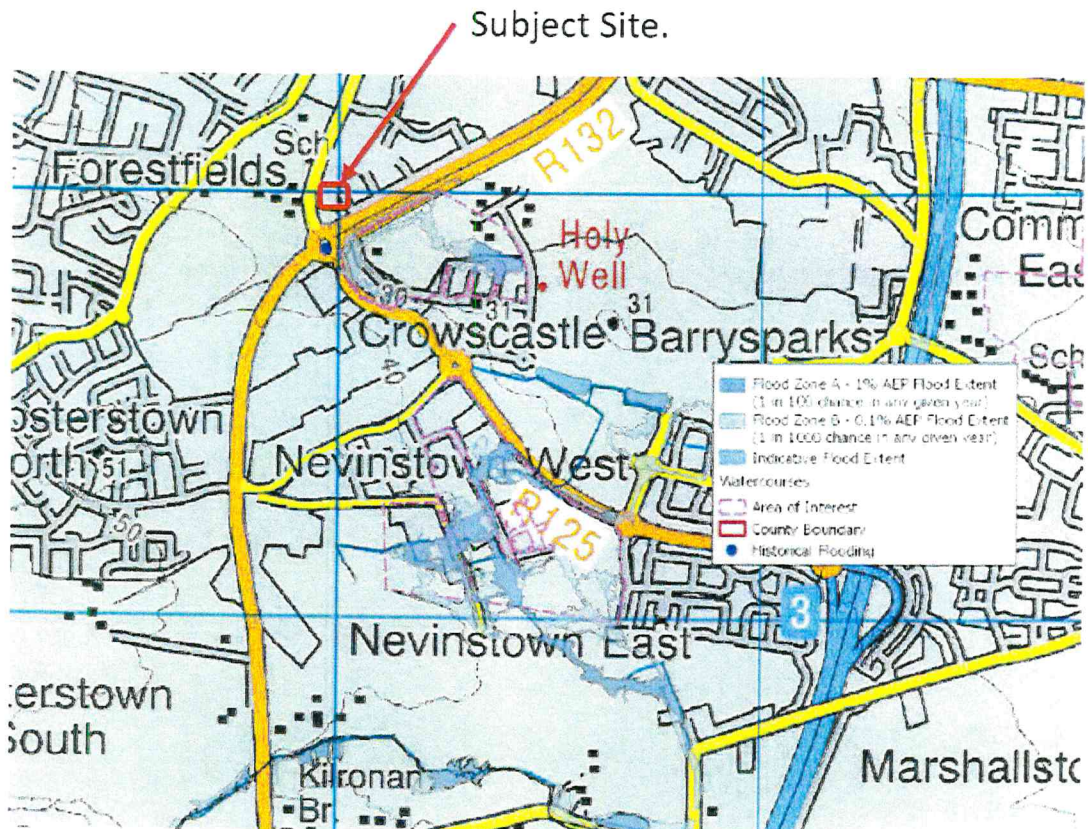


Figure 8 Extract from Fingal Development Plan (2017-2023)

As clearly shown above, the subject site lies outside the confines of Flood Zone 'A' and Flood Zone 'B'. Therefore, we are of the opinion that the subject site lies within in Flood Zone 'C'.

3.3 Stage 3: Detailed Flood Risk Assessment

The purpose of this stage is to identify possible flood risks and to implement the necessary level of appraisal to assess these possible risks in order to ensure that these can be adequately addressed in the Flood Risk Assessment, to address the potential impact on flood risk elsewhere and the effectiveness of any proposed mitigation measures.

In consideration of the information collated as part of this assessment, and the availability of other information and data specific to the subject site, it is considered that sufficient quantitative information to complete an appropriate flood risk assessment can be derived from the information collated. In particular, the final flood extent maps

for the area produced as part of the Fingal East Meath FRAM Study are based on the results of detailed hydraulic modelling undertaken along the Ward River and Gaybrook Stream (North) and therefore, provide a reasonably accurate delineation of flood zones and prediction of flood depths in the general vicinity of the subject site.

The Stage 1 risk assessment indicated the primary potential flood risk to the subject site can be attributed to a potential surcharge of the urban drainage infrastructure within the vicinity of the site.

The initial Flood Risk Assessment undertaken as part of this Site Specific Flood Risk Assessment has determined that the subject site is not at risk of fluvial, coastal/tidal, pluvial (overland flow) or groundwater flooding. Information and data collated as part of the Initial Flood Risk Assessment (OPW, CFRAM Flood Maps, GSI Bedrock & Geotechnical Maps, Fingal Development Plan (2017-2023)) does not indicate any recorded, observed, historical or predictive flood zones within the curtilage of the subject site. Therefore, pluvial, coastal/tidal, pluvial (overland flow) and groundwater flooding risk to the subject site will not be assessed further as part of this Site Specific Flood Risk Assessment.

The above assessment indicates that the subject site may be susceptible to pluvial flooding (urban drainage).

3.3.1 Pluvial Flood Risk (Urban Drainage)

The risk of pluvial flooding is, most likely, due to surcharging of the urban drainage network in the vicinity of the site. To our knowledge, there has been no recorded surcharging of the urban drainage network in the vicinity of the site since 2005.

3.3.2 Pluvial Run-Off from the Proposed Development

Refer to Eamonn Doyle Associates' "Site Services Report" for proposed measures.

3.3.4 Fluvial Flood Risk

As stated above, the Initial Flood Risk Assessment has determined that there is no flood risk of the subject site from the Ward River or Gaybrook Stream (North).

4. FLOOD ZONES

In the context of 'The Planning System and Flood Risk Management – Guidelines or Planning Authorities, DEHLG, (2009)', three types or levels of flood zones are designated in consideration of flood risk to a particular development site (see Clause.2.23).

Flood Zone 'A' – where the probability of flooding from rivers and the sea is the highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).

Flood Zone 'B' – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding, and between 0.1% or 1 in 1000 and 0.5% or 1 in 200 for coastal flooding).

Flood Zone 'C' – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for river and coastal flooding). Flood Zone 'C' covers all areas that are not in Zones 'A' or 'B'.

'The Planning System and Flood Risk Management - Guidelines for Planning Authorities' lists the planning implications for each flood zone, as summarized below;

Zone A – High Probability of Flooding: Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation would be considered appropriate in this zone.

Zone B – Moderate Probability of Flooding: Highly vulnerable development such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses, primary strategic transport and utilities infrastructure would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development and recreational facilities might be considered appropriate in this zone. In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone 'C' and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can and will be adequately managed.

Zone C – Low Probability of Flooding: Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning & sustainable development considerations. Developments in this zone are generally not considered at risk of fluvial flooding and would not adversely affect adjacent lands and properties from a flood risk perspective.

With reference to Figure 8 above, we are of the opinion that the subject site lies within in Flood Zone 'C'.

In accordance with Table 3.1 of The Planning System & Flood Risk Management Guidelines for Planning Authorities (November 2009) – (Classification of Vulnerability of Different Types of Development), a hostel (hotel) is classified as being a 'highly vulnerable' development. See Figure 8 below.

PROPOSED LOCAL DAY CARE CENTRE FOR ST. MICHAEL'S HOUSE

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children's homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.</p>
Less vulnerable development	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
Water-compatible development	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>

*Uses not listed here should be considered on their own merits

Table 3.1 Classification of vulnerability of different types of development

Figure 9 Classification of Vulnerability of Different Types of Development (The Planning System and Flood Risk Management)

In accordance with Table 3.2 of the Planning System & Flood Risk Management Guidelines for Planning Authorities (November 2009), a 'highly vulnerable' commercial development in Flood Zone C is considered as 'appropriate' and does not require a Justification Test to be carried out. See Figure 10 below.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

*Figure 10 Matrix of Vulnerability versus Flood Zone
(The Planning System and Flood Risk Management)*

5. CONCLUSION

- a) Based on the site specific flood risk assessment carried out, we suggest that the proposed Local Day Care Centre development is an appropriate form of development on this subject site.
- b) Based on the site specific flood risk assessment, the proposed Local Day Care development will not raise any significant flooding issues, as it will not obstruct flow paths.
- c) Based on the above site specific flood risk assessment, we conclude that due regard has been taken in assessing the potential for flooding on the subject site, given the information available at this time. Mitigation measures, where necessary and appropriate, have been specified.

Signed: _____

Eamonn Doyle
Chartered Engineer

On behalf of Eamonn Doyle Associates.

6. **FLOOD RISK ASSESSMENT REFERENCE DOCUMENTS**

Planning System & Flood Risk Management -Guidelines for Planning Authorities (Dept. of Environment, Heritage & Local Government & Office of Public Works), 2009.

Department of Environment, Community & Local Government Circular PL 2/2014

The Greater Dublin Strategic Drainage Study (GDSDS), 2005.

OPW website– www.floodinfo.ie website.

C624 Development & Flood Risk (Construction Industry Research & Information Association).

Extreme Rainfall Return Period Table (Met Eireann).

Greater Dublin Strategic Drainage Study, Regional Drainage Policies - Technical Documents, March 2005.

Fingal Development Plan (2017 – 2023)