PROPOSED RESIDENTIAL DEVELOPMENT AT CHURCH FIELDS EAST, MULHUDDART, DUBLIN 15

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) VOLUME 3 : APPENDICES

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Environmental Assessment **Built Environment**

Client: Fingal County Council

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Issue	Status	Date	Prepared	Checked
01	FINAL	02 Jun 2023	Namrata Kaile; Various	Thomas Burns

Contents

Appendix 8.1 Bat Survey Report

A Bat Evaluation of the Churchfields site, Mulhuddart, Fingal, County Dublin,

Brian Keeley B.Sc. (Hons) in Zool. May 2023

Surveyed August 2020 and July 2021 and September 2022

Introduction

Most of Ireland's mammals enjoy protection under the Wildlife Act (1976) and the more recent updating of this legislation (Wildlife (Amendment) Act 2000, S.I. No. 94 of 1997, S.I. No. 378 of 2005, European Communities (Natural Habitats) (Amendment) Regulations, 2005). In conjunction with the enactment of the Habitats Directive into Irish legislation, all native mustelid species and bat species are protected with further protection given to otters and lesser horseshoe bats.

Determining the mammal fauna of an area may involve a high level of assessment if the aim of the survey is to catalogue all mammals but this is too detailed for the aim of creating mitigation for a new road alignment. This assessment is specific to the presence of bats within lands proposed for the construction of housing in what is currently green space and unmanaged lands in county Dublin.

The survey undertaken within the site allows a targeting of mitigation measures to the appropriate or most efficient sites to prevent accidental death or injury and to determine if it would be possible to provide safe passage across long-established routes through a new development.

Fieldwork for the current report on bat distribution was carried out by Brian Keeley, an ecologist with over a quarter of a century of fieldwork experience. This report addresses the key issues affecting the bat fauna considered in this assessment and created by construction and the presence of the infrastructure and buildings.

Construction activities and subsequent operation of the proposed development, create a number of significant short-term and long-term risks for the resident bat population, in addition to impacts upon other vertebrates and invertebrates. The construction itself may involve the removal of key features of the surrounding environment and of the habitats of bats and other mammal species, such as trees, hedgerow lines and grassland in which to feed. The most damaging operation is the potential for the destruction of roosts and for the accidental exclusion or killing of bats roosting within trees upon the site.

There is the potential of losses of commuting routes and feeding areas where development greatly modifies the availability of insect prey, creates a barrier to movement or removes access to roost sites, rendering feeding sites too distant from any alternative roosts used. In this scheme, there would be no building removal but there would be possible tree losses or tree surgery to accommodate the infrastructure and to deal with any perceived or actual risk from trees.

Methodology

The site and adjoining lands were assessed for the presence of bats over a number of years from 2020 to 2022. The first assessment was undertaken on 19th to 20th August 2020 by means of an inspection of all mature trees and by a bat detector assessment commencing prior to dusk (at hours) and continuing for two hours before resuming from 4.45 am with dawn occurring at 6.15 am. Two surveyors were involved for the entirety of the survey, and each observed separate sections of the same site (except where it was necessary to provide security backup when a passer-by or resident arrived). An Echometer 3 (EM3) was held throughout the assessment by each surveyor and the GPS attachment assisted in plotting the species of bat noted.

Additional to this, in 2020, two Song Meter 2 Mini monitors were positioned within the lands at the base of a mature tree to the east and in open land close to immature trees to the west to determine the level of bat activity within the site throughout the night. Signals recorded on the EM3, and SM Mini were stored on SDHC cards and transferred to a HP laptop and desktop for analysis. Signals were identified with Kaleidoscope Pro and included a manual verification of most calls.

The site was walked repeatedly to check for emerging, commuting and feeding bats. The dawn assessment concentrated on identifying possible roosts sites in trees (or if bats left the site entirely).

A follow-up survey was undertaken on 20th to 21st July 2021. This involved a daytime examination of all trees followed by a bat detector assessment undertaken by two surveyors each equipped with an Echometer 3+ handheld broad spectrum monitor All signals recorded on to SD cards or phone memory were analysed with Kaleidoscope Pro sound analysis software.

The survey concentrated at the start of the dusk survey at the trees outsidethe eastern perimeter of the site and progressed to all other areas once emergence was considered to have been complete.

Surveying re-commenced one hour prior to sunrise and continued for one hour (up to sunrise).

A final assessment of the site was undertaken on 5th and 7th September 2022 to update the bat data from the site from 2020 and 2021. Surveying involved coverage of the eastern and central section on 5th September and the western to central section on 7th September including the vegetation flanking the stream on the western edge of the site and a brief period of evaluation of the eastern edge of the site both during the night and prior to sunrise. Surveying covered dusk and dawn as above (i.e., 1.5 hours at sunset and 1 hour prior to sunrise).

Survey area in 2021 and 2022 (within yellow line) and in 2020 (red fill)

Survey constraints

The bat surveys were undertaken in a very suitable period to identify maternity roosts and high bat activity in 2020 and 2021. The weather conditions are typically highly suited to bats at this time of year (it was dry and suitably warm on the night of survey). In both summers, the weather conditions were fully suited to bat activity. The survey in September was at a period when bat activity is typically high. However, weather was unsettled in particular on 7th September when rain became very heavy at some stages of the assessment. Rain had ceased by sunset at 20.00 hours but commenced again at 20.39 hours. There was a 44-minute interruption to bat activity after sunset. The temperature at sunrise (06.46 hours) was 16 degrees Celsius and it was predominantly dry with light rain at 06.22 hours. Nonetheless, there was bat activity during the active survey and during the night and prior to sunrise based on the active and passive surveys combined. Temperature at sunset on 7th September was 17 degrees Celsius. Sunset was at 20.05 hours on 5th September with a strong breeze blowing in dry conditions and a temperature of 16 degrees Celsius. The temperature at sunrise was 15 degrees Celsius. Rain commenced close to sunrise (which was at 06.43 hours).
In July 2021, sunrise was at 05.25 hours. The current temperature was 14 degrees Celsius.

Results

In all, three species of bat were noted within the Churchfields area. These were common and soprano pipistrelles and Leisler's bats. These are potentially the three most commonly encountered bat species in Ireland and are found within all counties and into city centres as well as in rural areas.
The pipistrelle species are probably the two most common bat species in Ireland.
None of the bats were seen to enter or leave the trees on site prior to sunrise or to emerge at sunset. There was one Leisler's bat mating perch within the substantial beech trees outside the eastern edge of the site in 2021 and a Leisler's bat was noted in this area prior to sunrise in 2022

(06.35 hours with sunrise at 06.46 hours). This tree is therefore a bat roost, but it is not a maternity roost. A soprano pipistrelle activity was noted around trees prior to sunrise in 2020 but the final destination of the bat was not discovered. The possible / probable roost was one of two or three trees 2/3rd south along the edge of the site along the eastern edge and outside the site area (see the figure on Page 6). There was activity of all three bat species close to the trees prior to sunrise in 2021 also but no bat was seen to enter any of the trees.

All three species will avail of trees for roosting, with Leisler's bat probably the most commonly encountered in trees of these species. There are several mature beech trees along the edge of the site that have high roost potential.

Leisler's bat activity was relatively high within the site, over the grassland and towards the mature line of beech trees. The lands to the west of the soil berm were less used by bats and this area is relatively exposed in comparison to the eastern side of the site. Leisler's bats were present after sunset and prior to sunrise and it is probable that roosts are present close to the site, but no maternity roosts or other Leisler's bat daytime roosts were confirmed during these surveys.

In September 2022, there was bat activity despite mixed weather conditions. This may have delayed activity for Leisler's bats (not heard until 40 minutes after sunset on 5th September).

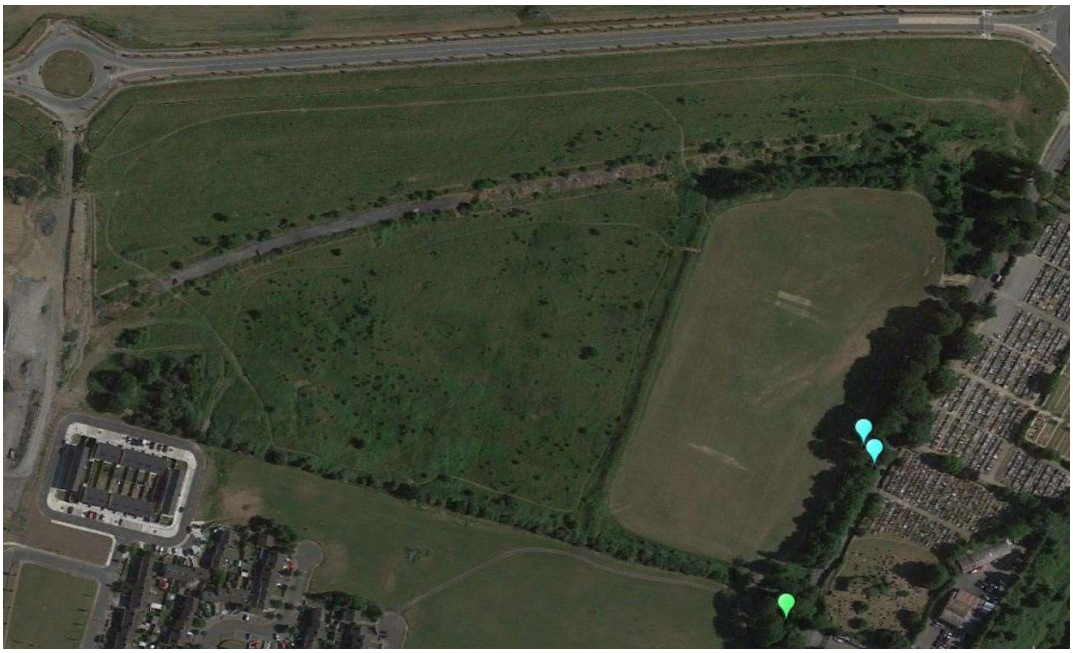
Location of site and Bat activity after sunset at the Churchfields site August 2020

Legend

Boxes Locations of static recorders

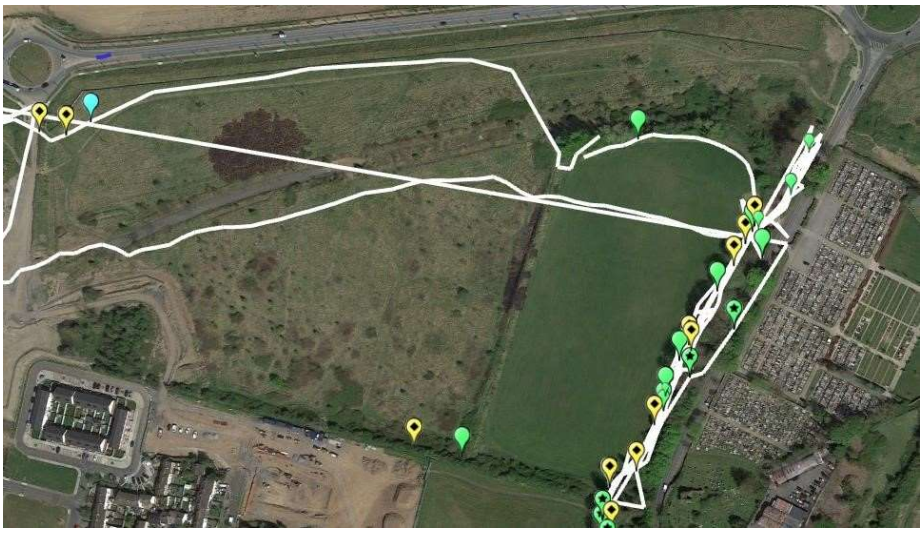
Green paddle Common pipistrelle activity Blue paddle Soprano pipistrelle activity

Yellow paddle Leisler's bat activity



Bat activity prior to sunrise within the site August 2020

Only common and soprano pipistrelle were noted within the site at this time in a very limited area and there was the potential for a roost in the trees noted by the two blue paddles



Bat activity from sunset onwards and prior to sunrise within the site July 2021

All three species were present prior to sunrise compared to the absence of Leisler's in 2020

Green paddle Common pipistrelle activity Starred = Prior to sunrise

Blue paddle Soprano pipistrelle activity Starred = Prior to sunrise

Yellow paddle Leisler's bat activity

White line Transect of surveyors.

Proposed development in the eastern area of the Churchfield lands adjacent to Mulhuddart Cemetery

Bat activity 5th to 6th September 2022

Leisler's bat activity was the most widespread activity, but common pipistrelles may have been equally abundant but are more localised and with lower call strength. Soprano pipistrelles were the least common of the bats encountered (only noted in a 5-minute period 20.46 to 20.51 hours).

Bat activity 7 th to 8th September 2022

The main area of this assessment was the western section of the winder Churchfields lands, and this was dominated by common pipistrelle activity. There was occasional soprano pipistrelle and Leisler's bat. Leisler's bat activity was also noted to the east at an area where a line of trees remain (there is construction over much of the western area). During examinations of the eastern edge mature trees 100 minutes after sunset, common and soprano pipistrelles were noted at the southern end, with common pipistrelle and a Leisler's bat in the middle and towards the north-eastern edge of the site. Prior to sunrise, a Leisler's bat was here within 11 minutes of sunrise. It was not seen to enter any tree.

Proposed Development

The proposed development relates to a site of c.5.52 hectares at Church Fields East, Mulhuddart, Dublin 15. The development site is located south of Damastown Avenue; west of Church Road; east of previously permitted residential development at Church Fields (Planning Reg. Ref.: PARTXI/012/21); and north of a permitted linear park (Eastern Linear Park Planning Reg. Ref.: PARTXI/012/21), in the townland of Tyrrelstown, Dublin 15. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a mixed tenure development, comprising of 121 no. houses and 96 no. apartments. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works.

Impacts Upon Bats

Roost Loss

There is the potential for roost loss if any of the mature beech trees are removed from the site. This may arise where tree surgery is deemed essential for human safety. There were two trees which were considered to be bat roosts for individual bats that lie outside of the construction area and should not be removed by the development. As bat roosts are protected structures and their removal is contrary to the Wildlife Act and Habitats Directive without a derogation issued by NPWS. This may be a permanent slight to moderate negative impact for bats. However, none of the trees within the project red line itself are of significant value for roosting bats and the line of beech trees is entirely outside the proposed development site. It is separated from it by a cycleway, currently under construction.

Feeding

There will be a loss of feeding for bats from the changes to the vegetation on site. Given that there was a relatively small number of bats noted on site, this is unlikely to be considerable. The mature trees outside the eastern site boundary (the line of beech) will be retained as part of the proposed development, as will the hedgerow on the southern boundary of the field. The line of poplar and scrub that crosses the northern part of the site will be removed.

Lighting

There will be introduced lighting associated with access and security and this would affect commuting and foraging of species such as common and soprano pipistrelle and all other species with the exception of Leisler's bats. Illumination of any roost trees would affect *all* species as roost illumination is a much greater incursion upon bat roosting than on commuting. However, no light will fall on the line of beech trees outside the eastern site boundary as a result of the proposed development. Therefore no light-related impacts on roosting bats are expected to arise.

Cumulative impacts

There will be a slight permanent negative impact upon bats from this development. Should a bat roost be present in any trees that are adjoining the site. This would be of greatest significance if the tree requires surgery for safety reasons.

The likely impact of slight permanent negative would potentially be raised to moderate permanent negative if a roost is affected.

Mitigation and Conservation Measures to protect bats.

1) *Timing of tree felling*

2) *Provision of bat boxes*

3) *Lighting control*

1) Trees must be felled or undergo surgery at a period when birds and bats are unlikely to be breeding or for bats, hibernating. The ideal time for felling is September to early November (or late October if weather conditions are set to be cold). If trees are to be felled at other times, intensive efforts to determine if bats and birds are present must be undertaken (e.g., fibrescope examinations from a height access e.g., MEWP).

Notwithstanding the low likelihood of roosting bats being present in the trees on the site, all trees must be examined for the presence of bats prior to felling / surgery. This must be carried out by a bat specialist with appropriate experience of tree assessments. If bats are discovered, it will be necessary to acquire a licence to derogate from the Department of Housing, Local Government and Heritage through the National Parks and Wildlife Service. Should it be necessary all work to exclude bats must be done according to the conditions of the licence and by a licensed bat specialist. (It is an offence to disturb or destroy a bat roost without written approval and under the guidance of a specialist).

2) It is not expected that bat roosts will be lost as a result of the proposed development. It is therefore not necessary to install bat boxes at the site. However, as part of the overall ecological enhancement measures that will be implemented as part of the proposed development it is proposed to install bat and swift boxes/bricks within the fabric of the buildings. A total of four combined bat/swift briocks, or equivalent, will be installed. The boxes/bricks will be installed in accordance with the advice of the project ecologist.

3) Lighting control

Lighting shall be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. None of the beech trees to the east, or the trees proposed for planting, shall be illuminated.

- Dark corridor for movement of bats along the grounds of the site. Lighting should be directed downwards away from the treetops.
- All luminaires shall lack UV elements when manufactured and shall be LED.

- A warm white spectrum (ideally <2700 Kelvin, but in accordance with Fingal County Council requirements) shall be adopted to reduce blue light component.
- Luminaires shall feature peak wavelengths higher than 550 nm.
- Tree crowns shall remain unilluminated.

At present, there is public lighting along the eastern edge, but this is not preventing foraging by pipistrelles here. This is also the area with the most mature trees.

Impacts of the Proposal following Mitigation

There will be no appreciable impact on the local bat fauna. There will be no long-term loss to the conservation status of the bat species present. There is the likelihood of a slight negative permanent impact from the loss of green within the site.

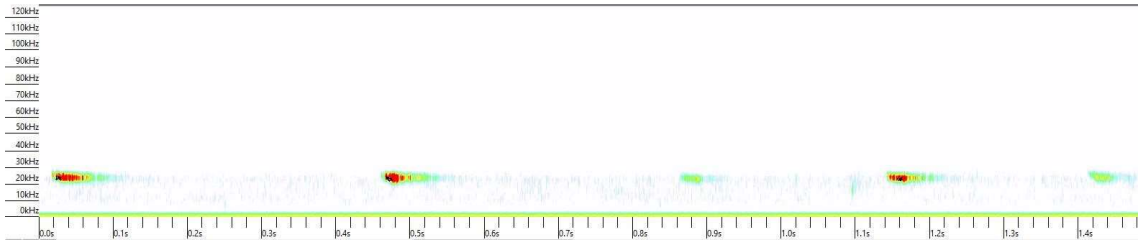
Trees with high bat roost potential and good feeding cover

Trees with high bat roost potential and good feeding cover are present outside the eastern boundary.

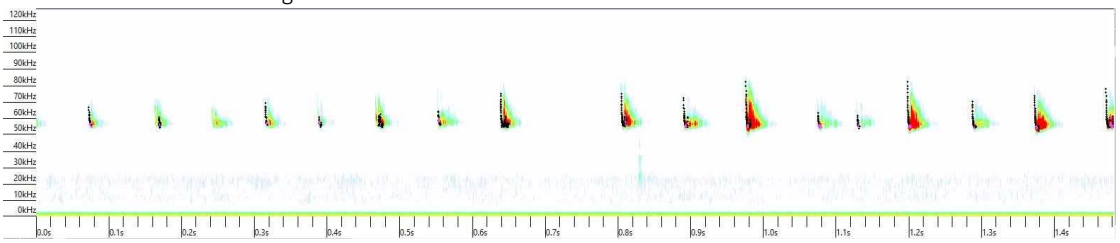
No major bat day roosts were noted. The trees outside the eastern boundary offer considerable access through cavities and rot and may serve as roost sites occasionally.

Bat activity recorded by static monitor at northwestern corner of site up to half an hour before sunrise 7th to 8th September 2022

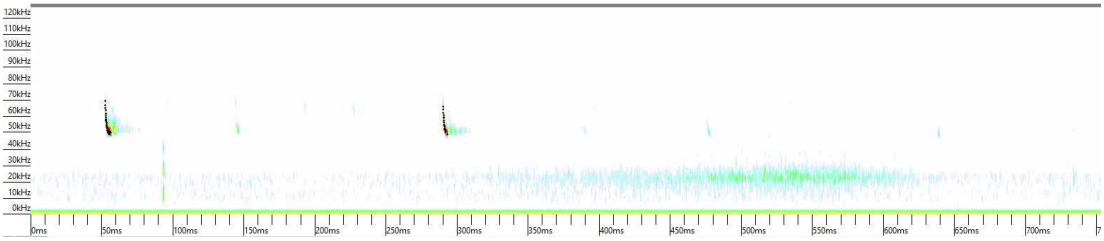
Bat species	Bat activity per hour										
	0	2	3	4	5	6	20	21	22	23	Grand Total
Leisler's bat		1			3	1		1			6
Common pipistrelle	2	3	1	1	8		6	9	3	1	34
Soprano pipistrelle	1				4	7	1	1			14
Grand Total	**3**	**4**	**1**	**1**	**15**	**8**	**7**	**11**	**3**	**1**	**54**



Final bat (a Leisler's) at 06.06 hours on 8th September 2022 recorded by static monitor on the western edge of the site. The last bat recorded overall during this survey was a Leisler's bat at 06.35 hours at the beech trees on the eastern site edge.



Soprano pipistrelle at 06.01 hours 8th September 2022



Brief common pipistrelle at 05.58 hours 8th September 2022

Example of bat data from handheld monitor (EM3) in July 2021

Date	Time	Auto Id	Pulses	Matching	Manual Id
20/07/2021	21:58:38	Leisler's Bat	14	11	Leisler's Bat
20/07/2021	21:58:53	Leisler's Bat	15	13	Leisler's Bat
20/07/2021	22:00:54	Leisler's Bat	4	4	Leisler's Bat
20/07/2021	22:00:59	Leisler's Bat	7	7	Leisler's Bat
20/07/2021	22:01:04	Leisler's Bat	2	2	Leisler's Bat
20/07/2021	22:08:10	Leisler's Bat	2	2	Leisler's Bat

20/07/2021	22:13:38	Noid	2	0	Leisler's Bat
20/07/2021	22:14:05	Leisler's Bat	5	4	Leisler's Bat
20/07/2021	22:15:56	Leisler's Bat	4	4	Leisler's Bat
20/07/2021	22:18:12	Serotine	22	12	Leisler's Bat
20/07/2021	22:18:17	Serotine	13	9	Leisler's Bat
20/07/2021	22:18:27	Serotine	8	5	Leisler's Bat
20/07/2021	22:19:03	Soprano	24	24	Soprano Pipistrelle
20/07/2021	22:19:38	Leisler's Bat	13	12	Leisler's Bat
20/07/2021	22:19:43	Leisler's Bat	13	9	Leisler's Bat
20/07/2021	22:19:48	Leisler's Bat	28	12	Leisler's Bat
20/07/2021	22:19:53	Leisler's Bat	19	12	Leisler's Bat
20/07/2021	22:19:58	Leisler's Bat	5	5	Leisler's Bat
20/07/2021	22:20:03	Leisler's Bat	25	20	Leisler's Bat
20/07/2021	22:20:08	Leisler's Bat	12	9	Leisler's Bat
20/07/2021	22:20:13	Leisler's Bat	14	13	Leisler's Bat
20/07/2021	22:20:18	Leisler's Bat	11	11	Leisler's Bat
20/07/2021	22:20:23	Leisler's Bat	6	2	Leisler's Bat
20/07/2021	22:20:28	Serotine	25	15	Leisler's Bat
20/07/2021	22:20:33	Leisler's Bat	12	9	Leisler's Bat
20/07/2021	22:20:53	Leisler's Bat	7	6	Leisler's Bat
20/07/2021	22:22:29	Soprano	16	16	Soprano Pipistrelle
20/07/2021	22:22:59	Leisler's Bat	3	3	Leisler's Bat
20/07/2021	22:25:16	Serotine	4	3	Leisler's Bat
20/07/2021	22:25:31	Noid	2	0	Leisler's Bat
20/07/2021	22:26:07	Leisler's Bat	2	2	Leisler's Bat
20/07/2021	22:26:12	Leisler's Bat	18	16	Leisler's Bat
20/07/2021	22:26:17	Leisler's Bat	6	6	Leisler's Bat
20/07/2021	22:26:27	Leisler's Bat	13	12	Leisler's Bat
20/07/2021	22:26:32	Leisler's Bat	14	10	Leisler's Bat
20/07/2021	22:26:37	Leisler's Bat	19	15	Leisler's Bat
20/07/2021	22:26:42	Leisler's Bat	8	7	Leisler's Bat
20/07/2021	22:26:47	Noid	2	0	Leisler's Bat
20/07/2021	22:26:52	Leisler's Bat	12	7	Leisler's Bat
20/07/2021	22:26:57	Leisler's Bat	19	17	Leisler's Bat
20/07/2021	22:27:07	Leisler's Bat	7	6	Leisler's Bat
20/07/2021	22:27:12	Leisler's Bat	4	2	Leisler's Bat
20/07/2021	22:27:17	Leisler's Bat	7	5	Leisler's Bat
20/07/2021	22:27:27	Leisler's Bat	9	6	Leisler's Bat
20/07/2021	22:27:32	Leisler's Bat	14	8	Leisler's Bat

20/07/2021	22:27:48	Serotine	15	9	Leisler's Bat
20/07/2021	22:27:53	Serotine	5	3	Leisler's Bat
20/07/2021	22:28:13	Leisler's Bat	18	12	Leisler's Bat
20/07/2021	22:28:18	Leisler's Bat	4	3	Leisler's Bat
20/07/2021	22:29:33	Leisler's Bat	3	3	Leisler's Bat
20/07/2021	22:32:30	Serotine	11	6	Leisler's Bat
20/07/2021	22:32:35	Serotine	20	15	Leisler's Bat
20/07/2021	22:32:40	Leisler's Bat	2	2	Leisler's Bat
20/07/2021	22:32:45	Serotine	14	6	Leisler's Bat
20/07/2021	22:32:50	Serotine	14	10	Leisler's Bat
20/07/2021	22:32:55	Leisler's Bat	21	12	Leisler's Bat
20/07/2021	22:34:41	Leisler's Bat	8	7	Leisler's Bat
20/07/2021	22:34:46	Leisler's Bat	6	4	Leisler's Bat
20/07/2021	22:34:51	Leisler's Bat	9	8	Leisler's Bat
20/07/2021	22:34:56	Leisler's Bat	8	6	Leisler's Bat
20/07/2021	22:35:01	Leisler's Bat	11	10	Leisler's Bat
20/07/2021	22:37:43	Serotine	17	9	Leisler's Bat
20/07/2021	22:38:33	Leisler's Bat	12	9	Leisler's Bat
20/07/2021	22:38:43	Serotine	2	2	Leisler's Bat
20/07/2021	22:40:44	Common	6	6	Common Pipistrelle
20/07/2021	22:40:49	Common	19	19	Common Pipistrelle
20/07/2021	22:42:25	Common	2	2	Common Pipistrelle
20/07/2021	22:46:04	Common	24	24	Common Pipistrelle
20/07/2021	22:52:27	Soprano	17	17	Soprano Pipistrelle
20/07/2021	22:53:17	Common	12	9	Common Pipistrelle
20/07/2021	22:53:42	Leisler's Bat	4	4	Leisler's Bat
20/07/2021	22:53:47	Leisler's Bat	4	2	Leisler's Bat
20/07/2021	22:54:34	Common	26	24	Common Pipistrelle
20/07/2021	22:54:59	Common	17	15	Common Pipistrelle
20/07/2021	22:55:04	Common	10	6	Common Pipistrelle
20/07/2021	22:55:39	Soprano	23	23	Soprano Pipistrelle
20/07/2021	22:55:44	Soprano	40	40	Soprano Pipistrelle
20/07/2021	22:55:49	Soprano	6	6	Soprano Pipistrelle
20/07/2021	22:56:09	Soprano	12	12	Soprano Pipistrelle
20/07/2021	22:56:19	Soprano	19	19	Soprano Pipistrelle
20/07/2021	22:59:26	Leisler's Bat	2	2	Leisler's Bat
20/07/2021	22:59:31	Leisler's Bat	5	5	Leisler's Bat
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20/07/2021	23:03:03	Leisler's Bat	7	7	Leisler's Bat
20/07/2021	23:03:18	Leisler's Bat	3	3	Leisler's Bat

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20/07/2021	23:08:56	Common	12	12	Common Pipistrelle
21/07/2021	04:14:00	Leisler's Bat	2	2	Leisler's Bat
21/07/2021	04:15:16	Common	3	3	Common Pipistrelle
21/07/2021	04:15:21	Common	5	5	Common Pipistrelle
21/07/2021	04:15:46	Common	16	16	Common Pipistrelle
21/07/2021	04:15:56	Common	4	4	Common Pipistrelle
21/07/2021	04:16:01	Common	13	13	Common Pipistrelle
21/07/2021	04:19:43	Leisler's Bat	3	3	Leisler's Bat
21/07/2021	04:23:20	Common	5	5	Common Pipistrelle
21/07/2021	04:23:25	Common	7	7	Common Pipistrelle
21/07/2021	04:24:00	Common	11	11	Common Pipistrelle
21/07/2021	04:24:05	Common	8	8	Common Pipistrelle
21/07/2021	04:24:10	Common	11	11	Common Pipistrelle
21/07/2021	04:25:00	Soprano	3	3	Soprano Pipistrelle
21/07/2021	04:25:46	Common	2	2	Common Pipistrelle
21/07/2021	04:55:41	Leisler's Bat	5	5	Leisler's Bat
21/07/2021	04:55:46	Leisler's Bat	11	11	Leisler's Bat
21/07/2021	04:55:51	Leisler's Bat	7	4	Leisler's Bat
21/07/2021	04:56:06	Leisler's Bat	8	8	Leisler's Bat
21/07/2021	04:56:31	Leisler's Bat	5	5	Leisler's Bat
21/07/2021	04:56:56	Leisler's Bat	15	14	Leisler's Bat
21/07/2021	04:57:02	Leisler's Bat	4	4	Leisler's Bat
21/07/2021	04:57:07	Leisler's Bat	12	12	Leisler's Bat
21/07/2021	04:57:27	Leisler's Bat	2	2	Leisler's Bat
21/07/2021	04:59:18	Leisler's Bat	2	2	Leisler's Bat
21/07/2021	04:59:23	Leisler's Bat	9	9	Leisler's Bat
21/07/2021	04:59:33	Leisler's Bat	8	7	Leisler's Bat

Appendix 8.2 Outline Biosecurity Plan

1.1 Introduction

This document presents an outline Biosecurity Plan for the construction phase of the proposed residential development at Church Fields East in Mulhuddart, Dublin 15 ('the proposed development' hereafter).

It has been prepared by Brady Shipman Martin, and will be finalised by the appointed contractor in agreement with Fingal County Council, in advance of the commencement of the proposed works, and implemented throughout the proposed works. The final Biosecurity Plan may be integrated into the Construction & Environmental Management Plan (CEMP).

The objective of the Biosecurity Plan is to minimise the risk of introduction and / or dispersal of invasive alien species during the construction phase of the proposed development. For the purposes of this plan, 'biosecurity' refers to measures implemented to prevent and / or minimise the risk of the introduction or dispersal of invasive alien species.

1.2 Background

The proposed development is described in the main text of the Environmental Impact Assessment Report (Volume 2).

No species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) and European Communities (Birds and Natural Habitats) (Amendment) Regulations 2021 (SI No. 293/2021) were recorded at the site of the proposed development during the surveys undertaken for the purposes of the proposed development. This does not rule out the possibility that invasive alien plant species could become established at the site of the proposed development before the construction phase; or that invasive alien species could be introduced to the site, or dispersed within the site, or from the site to other areas; during the proposed works.

1.3 Relevant Legislation

Management of invasive alien species during the construction phase of the proposed development will comply with all relevant legislation, including the following:

- Noxious Weeds Act, 1936;
- Wildlife Acts, 1976 to 2022;
- Waste Management Acts, 1996 to 2022, and related legislation;
- Safety, Health and Welfare at Work Acts, 2005 to 2021, and related legislation;
- Regulation (EC) No. 1107/2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC;
- Commission Regulation (EU) No 1141/2010 laying down the procedure for the renewal of the inclusion of a second group of active substances in Annex I to Council Directive 91/414/EEC and establishing the list of those substances;
- European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477/2011) and European Union (Birds and Natural Habitats) (Amendment) Regulations 2021 (SI No. 293/2021) ;
- European Communities (Plant Protection Products) Regulations 2012 (SI No. 159/2012);

- European Communities (Sustainable Use of Pesticides) Regulations 2012 (SI No. 155/2012);
- Commission Implementing Regulation (EU) No 354/2013 on changes of biocidal products authorised in accordance with Regulation (EU) No 528/2012; and
- Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species.

Of particular relevance are Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). Regulation 49 has the effect of prohibiting the introduction and dispersal of certain species listed in Parts 1 and 2 of the Third Schedule of the Regulations. Regulation 50 has the effect of prohibiting the possessing for sale, breeding, reproduction or propagation; or selling, transporting, distributing, introducing or releasing; certain species listed in Parts 1, 2 and 3 of the Third Schedule of the Regulations, or vector material thereof.

Additionally, the Wildlife (Amendment) Act, 2000, of the Wildlife Act (1976) makes it an offence to cause an exotic species of flora (including flowers, roots, seeds or spores thereof) to grow in the wild in any place in the State.

1.4 Relevant Policies

The Biosecurity Plan shall be in accordance with the relevant aims, objectives, targets and recommendations of the following policy documents (and any subsequent iterations of same):

- European Commission (2020). *Communication: EU Biodiversity Strategy for 2030*.
- Department of Culture, Heritage and the Gaeltacht (2017). *National Biodiversity Action Plan 2017 – 2021*.
- Department of Housing, Local Government and Heritage (2022). *Draft for Public Consultation, Ireland's 4th National Biodiversity Action Plan.*
- Department of Agriculture, Food and the Marine (2020). *Plant Health & Biosecurity Strategy 2020 – 2025*.
- National Biodiversity Data Centre (2021). *All-Ireland Pollinator Plan (2021 – 2025)*.

1.5 Relevant Guidelines

The Biosecurity Plan shall be informed by the following guidance documents:

- National Roads Authority (2010). *Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads*.
- Burns, T., Dolan, L. M. J. & Whelan, P. M. (n.d.). *A Guide to Landscape Treatments for National Road Schemes in Ireland*. [Report prepared for National Roads Authority].
- Kelly, J. (2012). *Horticulture Code of Good Practice: To prevent the introduction and spread of Invasive Non-native Species*. [Report prepared for the Northern Ireland Environment Agency and the Irish National Parks and Wildlife Service].
- Department of Agriculture, Food and the Marine (n.d.). *"Good Plant Protection Practice"*.
- Invasive Species Ireland (2008). *Best Practice Management Guidelines: Japanese Knotweed (Fallopia japonica)*.

1.6 Recommended Measures

At a minimum, the following measures are recommended:

1.6.1 Pre-construction Survey & Management Recommendations

The Applicant will be responsible for ensuring that a pre-construction survey for invasive alien plant species is carried out of the entire site by a suitably qualified ecologist prior to the commencement of on-site works. At a minimum, this survey shall identify any species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477/2011) (as amended) but should also aim to identify any other invasive alien plant species that may post a risk of significant ecological impacts.

Where invasive alien plant species are identified on the site or in the immediate vicinity, appropriate and proportionate management measures shall be set out by a suitably qualified ecologist. In the first instance, the approach in respect of invasive alien plant species identified on the site should be to avoid insofar as possible the disturbance of vegetation or soil (e.g. mowing, hedge cutting, vegetation clearance, excavation, footfall and plant movements) in affected areas, allowing an appropriate buffer area. Exclusion zones may be established with fencing and signage to this effect.

Where physical or chemical control measures are recommended, a corresponding risk assessment should be undertaken, taking into account the relative costs and benefits in relation to ecology, human health, economic costs, etc., of the management options under consideration. Any physical or chemical control works to be undertaken shall be fully compliant with the relevant legislative provisions, in accordance with the National Roads Authority *Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (2010) and carried out by suitably qualified personnel with all appropriate safety precautions and environmental protection measures in place.

The transportation and disposal of invasive alien plant species material is a very high risk activity in terms of the risk of introduction and dispersal and, where required, shall be carried out by suitably qualified personnel in accordance with all applicable legislation and (where relevant) under licence from the National Parks and Wildlife Service.

Where physical or chemical control measures are implemented, periodic monitoring will be undertaken during the appropriate survey period, as recommended by the project ecologist or the specialist who undertook the control efforts in question, to determine whether the efforts have been successful. Where required, follow-up control efforts will be implemented.

1.6.2 Landscape Planting

Landscape planting will not use any invasive alien plant species, will aim to maximise the proportion of native species used, and will be conducted with reference to the above-listed policies and guidance documents, particularly:

- Burns, T., Dolan, L. M. J. & Whelan, P. M. (n.d.). *A Guide to Landscape Treatments for National Road Schemes in Ireland*. [Report prepared for National Roads Authority].
- Kelly, J. (2012). *Horticulture Code of Good Practice: To prevent the introduction and spread of Invasive Non-native Species*. [Report prepared for the Northern Ireland Environment Agency and the Irish National Parks and Wildlife Service].
- National Biodiversity Data Centre (2021). *All-Ireland Pollinator Plan (2021 – 2025)*.

1.6.3 Materials Management

- Invasive species may be introduced to a site through the importation of soils, aggregates, stones and other materials from off-site. The contractor will be responsible for ensuring that such materials

imported to the site of the proposed development are free of invasive alien species, e.g. through documentation from the provider and / or inspection of the source site in question.

- The on-site storage of soils will be managed in order to minimise the risk of colonisation by invasive alien plant species. Stockpiles of soil, for instance, shall not be situated in proximity to known occurrences of invasive alien plant species. Where soil stockpiles are expected to be *in situ* for long periods (≥1 year), these shall be seeded with a native grass mix to reduce the potential for colonisation.

1.6.4 Works In and Adjacent to Watercourses

Invasive species are dispersed easily in the aquatic environment and along riparian corridors / river banks. For this reason, access to surface watercourses and their banks (as well as works in these areas) should be avoided, other than where strictly required for the purposes of the proposed works and with regard to the following documents:

- Inland Fisheries Ireland (2020). *Planning for Watercourses in the Urban Environment*.
- Inland Fisheries Ireland (2016). *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*.
- National Roads Authority (2008). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes*.

1.6.5 Responsible Person

The contactor will appoint a responsible person from among the site personnel (e.g. a Site Environmental Manager or similar) to oversee the implementation of the Biosecurity Plan and associated record keeping. This person will liaise with the project ecologist and any other relevant persons, as necessary, to ensure the proper implementation of all biosecurity measures as set out in the final Biosecurity Plan.

Appendix 9.1 NRA Criteria for Rating the Magnitude and Significance of Impacts at EIA Stage- Land, Soils, Geology and Hydrogeology

NATIONAL ROADS AUTHORITY (NRA, 2009)

Table 1 Criteria for rating site importance of Geological Features (NRA, 2009)

Magnitude of Impact	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance, or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale	Large historical and/or recent site for construction and demolition wastes.

Magnitude of Impact	Criteria	Typical Example
	Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale	Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

Table 2 Criteria for rating impact magnitude at EIS stage – Estimation of magnitude of impact on soil / geology attribute (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 3 Criteria for rating Site Attributes - Estimation of Importance of Hydrogeology Attributes (TII, 2009)

Magnitude of Impact	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g., SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple well fields Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers Locally important potable water source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (TII, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually.

Table 5: Rating of Significant Environmental Impacts at EIS Stage (TII, 2009)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Appendix 9.2 Ground Investigation Ireland Report - Laboratory Soil Testing

Ground Investigations Ireland Ltd
www.gii.ie

Site Churchfields			**Trial Pit Number** SA01
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.20 X 0.70 X 1.15	**Ground Level (mOD)** 84.43	**Client**	**Job Number** 12314-10-22
	Location 707042.3 E 741387.6 N	**Dates** 28/11/2022	**Engineer** Waterman Moylan	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
				84.18	0.25			
					(0.15)	Brownish grey slightly sandy gravelly CLAY.		
				84.03	0.40	Weathered Rock consisting of grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL and COBBLES of Limestone.		
					(0.75)			
				83.28	1.15	Obstruction: Presumed Rock.		
						Terminated at 1.15m		

Plan

Remarks

No Groundwater encountered during excavation.
Trial pit sidewalls collapsing.
Soakaway test completed in trial pit.
Trial pit backfilled on completion of soakaway test.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	12314-10-22.SA01

Ground Investigations Ireland Ltd www.gii.ie			Site Churchfields	Trial Pit Number SA02
Machine : JCB 3CX Method : Trial Pit	Dimensions 2.20 X 0.45 X 2.00	Ground Level (mOD) 84.03	Client	Job Number 12314-10-22
	Location 706990.7 E 741444.1 N	Dates 28/11/2022	Engineer Waterman Moylan	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
				83.78	0.25	Firm brown slightly sandy gravelly CLAY with occasional cobbles.		
					(0.65)			
				83.13	0.90	Firm brownish grey slightly sandy gravelly CLAY.		
					(0.30)			
				82.83	1.20	Firm to stiff grey slightly sandy gravelly CLAY. (Possible Residual Soil)		
					(0.30)			
				82.53	1.50	Weathered Rock consisting of grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL of Limestone.		
					(0.50)			
				82.03	2.00	Obstruction: Presumed Rock.		
						Terminated at 2.00m		

Plan

Remarks

No Groundwater encountered during excavation.
Trial pit stable.
Soakaway test completed in trial pit.
Trial pit backfilled on completion of soakaway test.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	12314-10-22.SA02

Ground Investigations Ireland Ltd
www.gii.ie

Site Churchfields			**Borehole Number** BH07
Machine : Beretta T44 **Flush :** water **Core Dia:** 64 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 3.50m	**Ground Level (mOD)** 84.35	**Client**
	Location 707061.6 E 741576.2 N	**Dates** 10/02/2023	**Engineer** Waterman Moylan
			Job Number 12314-10-22
			Sheet 1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00						84.25	0.10	Brown TOPSOIL.			
	37						(2.00)	Brown slightly sandy slightly gravelly CLAY.			
2.00						82.25	2.10				
2.10	100	2	0	NI			(1.40)	Medium strong dark grey fine grained LIMESTONE. Highly weathered. Mostly Non Intact (2.20 - 3.50m BGL) 3 fracture set. F1: 20-30 degrees. Extremely closely to closely spaced. Undulating, rough. F2: 80-90 degrees. Undulating, rough. F3: 70-80 degrees. Extremely closely to medium spaced. Undulating, rough with occasional brown clay staining.			
3.50						80.85	3.50	Complete at 3.50m			

Remarks
Borehole complete at 3.50m BGL.
Slotted standpipe installed from 3.50m BGL to 2.0m BGL with plain pipe from 2.0m BGL to GL. Finished with concrete and a raised cover.

Scale (approx)	Logged By
1:50	RM

Figure No. 12314-10-22.BH07

Ground Investigations Ireland Ltd
www.gii.ie

Site Churchfields			**Borehole Number** BH08
Machine : Beretta T44 **Flush :** water **Core Dia:** 64 mm **Method :** Rotary Cored	**Casing Diameter** 96mm cased to 3.50m	**Ground Level (mOD)** 81.18	**Client**
	Location 706914.8 E 741323.9 N	**Dates** 09/02/2023	**Engineer** Waterman Moylan
			Job Number 12314-10-22
			Sheet 1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	63						(1.80)	Brown slightly sandy slightly gravelly CLAY.		
1.80				NI		79.38	1.80	Medium strong dark grey fine grained LIMESTONE. Highly weathered. Mostly Non Intact.		
2.00							(0.45)			
2.25	97	34	19	9		78.93	2.25	Medium strong to strong dark grey fine grained LIMESTONE. Slightly weathered. (2.25 - 3.50m BGL) 2 fracture sets. F1: 20-30 degrees. Closely spaced. Undulating, rough. Open to incipient with some grey clay infill. F2: 50-65 degrees. Planar, rough. Open to incipient.		
3.50							(1.25)			
						77.68	3.50	Complete at 3.50m		

Remarks
Borehole complete at 3.50m BGL.
Borehole backfilled on Completion

Scale (approx) 1:50

Logged By

Figure No. 12314-10-22.BH08

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: -
Location: Churchfields
Contact: James Cashen
EMT Job No: 22/20475

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	25-28	29-32				Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	WS06	WS08	WS12	WS13	CBR06	CBR10	CBR12									
Depth	0.20-1.20	0.10-0.90	0.25-0.56	0.20-1.10	0.50	0.50	0.50									
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T									
Sample Date	08/12/2022	08/12/2022	08/12/2022	08/12/2022	08/12/2022	08/12/2022	08/12/2022									
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1	1	1	1									
Date of Receipt	12/12/2022	12/12/2022	12/12/2022	12/12/2022	12/12/2022	12/12/2022	12/12/2022									
Solid Waste Analysis																
Total Organic Carbon #	0.15	0.75	0.26	1.26	1.13	0.27	0.96				3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025				6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035				1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	<30				500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22				-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64				100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025				0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015				0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07				2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	<350	700	490	520	800	<350	600				4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20				500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	77.4	76.9	84.7	78.5	78.0	72.9	76.5				-	-	-	<0.1	%	NONE/PM4
Moisture Content 105C (% Dry Weight)	29.2	30.1	18.0	27.5	28.2	37.2	30.8				-	-	-	<0.1	%	PM4/PM0
pH #	7.56	8.22	8.55	8.15	8.08	7.55	7.87				-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	3	3	5	8	<3	5				10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	16	<5	14	<5	8	16	<5				1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	<3	5	<3	<3	3	<3	<3				800	15000	25000	<3	mg/kg	TM38/PM0

Appendix 10.1 NRA Criteria for Rating the Magnitude and Significance of Impacts at EIA Stage- Hydrology

NATIONAL ROADS AUTHORITY (NRA-TII, 2009)

Table 1 Criteria for Rating Site Attributes – Estimation of Importance of Hydrological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery. Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes. Quality Class C (Biotic Index Q3, Q2- 3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.

Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1). Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

Table 2 Criteria for Rating Site Attributes – Estimation of Magnitude of Impact on Hydrological Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss or extensive change to a waterbody or water dependent habitat. Increase in predicted peak flood level >100mm. Extensive loss of fishery. Calculated risk of serious pollution incident >2% annually. Extensive reduction in amenity value.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm. Minor loss of fishery. Calculated risk of serious pollution incident >0.5% annually. Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.

Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm. Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm. Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Table 3 Rating of Significant Environmental Impacts at EIA Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Appendix 11.1 Dust Management Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 11.2 of Volume 2 EIAR Chapter 11 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK ODPM, 2002);
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

Appendix 15.1 Summary of Relevant Legislation

National monuments legislation 1930-2004

All archaeological sites have the full protection of the national monuments legislation (Principal Act 1930; Amendments 1954, 1987, 1994 and 2004).

In the 1987 Amendment of Section 2 of the Principal Act (1930), the definition of a national monument is specified as:

> any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections,
>
> any artificial cave, stone or natural product, whether forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position,
>
> any, or any part of any, prehistoric or ancient
>
> (i) tomb, grave or burial deposit, or
>
> (ii) ritual, industrial or habitation site,
>
> and
>
> any place comprising the remains or traces of any such building, structure or erection, any cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site...

Under Section 14 of the Principal Act (1930):

> It shall be unlawful...
>
> to demolish or remove wholly or in part or to disfigure, deface, alter, or in any manner injure or interfere with any such national monument without or otherwise than in accordance with the consent hereinafter mentioned (a licence issued by the Office of Public Works National Monuments Branch),
>
> or
>
> to excavate, dig, plough or otherwise disturb the ground within, around, or in the proximity to any such national monument without or otherwise than in accordance...

Under Amendment to Section 23 of the Principal Act (1930), a person who finds an archaeological object shall, within four days after the finding, make a report of it to a member of the Garda Síochána...or the Director of the National Museum...

The latter is of relevance to any finds made during a watching brief.

In the 1994 Amendment of Section 12 of the Principal Act (1930), all of the sites and 'places' recorded by the Sites and Monuments Record of the Office of Public Works are provided with a new status in law. This new status provides a level of protection to the listed sites that is equivalent to that accorded to 'registered' sites [Section 8(1), National Monuments Amendment Act 1954] as follows:

The Commissioners shall establish and maintain a record of monuments and places where they believe there are monuments and the record shall be comprised of a list of monuments and such places and a map or maps showing each monument and such place in respect of each county in the State.

The Commissioners shall cause to be exhibited in a prescribed manner in each county the list and map or maps of the county drawn up and publish in a prescribed manner information about when and where the lists and maps may be consulted.

In addition, when the owner or occupier (not being the Commissioners) of a monument or place which has been recorded, or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners and shall not, except in the case of urgent necessity and with the consent of the Commissioners, commence the work for a period of two months after having given the notice.

The National Monuments Amendment Act 2004

The National Monuments Amendment Act enacted in 2004 provides clarification in relation to the division of responsibilities between the Minister of Environment, Heritage and Local Government, Finance and Arts, Sports and Tourism together with the Commissioners of Public Works. The Minister of Environment, Heritage and Local Government will issue directions relating to archaeological works and will be advised by the National Monuments Section and the National Museum of Ireland. The Act gives discretion to the Minister of Environment, Heritage and Local Government to grant consent or issue directions in relation to road developments (Section 49 and 51) approved by An Bord Pleanála and/or in relation to the discovery of National Monuments

> 14A. (1) The consent of the Minister under section 14 of this Act and any further consent or licence under any other provision of the National Monuments Acts 1930 to 2004 shall not be required where the works involved are connected with an approved road development.
>
> (2) Any works of an archaeological nature that are carried out in respect of an approved road development shall be carried out in accordance with the directions of the Minister, which directions shall be issued following consultation by the minister with the Director of the National Museum of Ireland.
>
> Subsection 14A (4) Where a national monument has been discovered to which subsection (3) of this section relates, then
>
> (a) the road authority carrying out the road development shall report the discovery to the Minister
>
> (b) subject to subsection (7) of this section, and pending any directions by the minister under paragraph (d) of this subsection, no works which would interfere with the monument shall be carried out, except works urgently required to secure its preservation carried out in accordance with such measures as may be specified by the Minister

The Minister will consult with the Director of the National Museum of Ireland for a period not longer than 14 days before issuing further directions in relation to the national monument.

The Minister will not be restricted to archaeological considerations alone, but will also consider the wider public interest.

Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999

This Act provides for the establishment of a national inventory of architectural heritage and historic monuments.

Section 1 of the act defines "architectural heritage" as:

> (a) all structures and buildings together with their settings and attendant grounds, fixtures and fittings,
>
> (b) groups of such structures and buildings, and,
>
> (c) sites
>
> which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Section 2 of the Act states that the Minister (for Arts, Heritage, Gaeltacht and the Islands) shall establish the NIAH, determining its form and content, defining the categories of architectural heritage, and specifying to which category each entry belongs. The information contained within the inventory will be made available to planning authorities, having regard to the security and privacy of both property and persons involved.

Section 3 of the Act states that the Minister may appoint officers, who may in turn request access to premises listed in the inventory from the occupiers of these buildings. The officer is required to inform the occupier of the building why entry is necessary, and in the event of a refusal, can apply for a warrant to enter the premises.

Section 4 of the Act states that obstruction of an officer or a refusal to comply with requirements of entry will result in the owner or occupier being guilty of an offence.

Section 5 of the Act states that sanitary authorities who carry out works on a monument covered by this Act will as far as possible preserve the monument with the proviso that its condition is not a danger to any person or property, and that the sanitation authority will inform the Minister that the works have been carried out.

The provisions in the Act are in addition to and not a substitution for provisions of the National Monument Act (1930–94), and the protection of monuments in the National Monuments Act is extended to the monuments covered by the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999).

Planning and Development Act, 2000

Structures of architectural, cultural, scientific, historical or archaeological interest can also be protected under the Planning and Development Act, 2000 (as amended).

This act provides for the inclusion of protected structures into the planning authorities' development plans and sets out statutory regulations regarding works affecting such structures. Under the new legislation, no distinction is made between buildings formerly classified under development plans as List 1 and List 2. Such buildings are now all regarded as 'protected structures'.

The act defines a 'protected structure' as follows:

> (a) a structure, or

(b) a specified part of a structure,

which is included in a record of protected structures, and, where that record so indicates, includes any specified feature which is within the attendant grounds of the structure and which would not otherwise be included in this definition.

'Protection', in relation to a structure or part of a structure, includes conservation, preservation, and improvement compatible with maintaining the character and interest of the structure or part;

Part IV of the act deals with architectural heritage, and Section 57 deals specifically with works affecting the character of protected structures or proposed protected structures.

…the carrying out of works to a protected structure, or a proposed protected structure, shall be exempted development only if those works would not materially affect the character of—

(a) the structure, or

(b) any element of the structure which contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Section 58, subsection 4 states that:

Any person who, without lawful authority, causes damage to a protected structure or a proposed protected structure shall be guilty of an offence.

Appendix 15.2 Glossary of Impacts and Assessment Methodology

Glossary of Impacts

Types of Impacts

Potential impacts on the receiving cultural heritage environment can be described as direct physical impacts, indirect physical impacts, and impacts on setting (i.e. the surroundings in which an archaeological / cultural heritage asset can be experienced; Historic England 2017).

Direct physical impacts are those development activities that directly cause damage to the fabric of a cultural heritage asset. Typically, these activities are related to construction works; e.g. they could include excavation of foundations, earthmoving / site preparation creation of access roads, cycle paths, and the excavation of service trenches.

Indirect physical impacts are those processes, triggered by development activity, that lead to the degradation of cultural heritage assets.

Impacts on the setting of cultural heritage assets describe how the presence of a development changes the surroundings of an asset in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual impacts are most commonly encountered. Such impacts may be encountered at all stages in the life cycle of a development, but they are only likely to be considered significant during the prolonged operational life of the development.

Types of impact (now referred to as effects), as defined by the EPA Guidelines on Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022):

- *Cumulative Impact* – The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant, effects.
- *Do Nothing Impact* – The environment as it would be in the future should the subject project not be carried out.
- *Indeterminable Impact* – When the full consequences of a change in the environment cannot be described.
- Irreversible Impact – When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
- *Residual Impact* – The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
- '*Worst case' Impact* – The effects arising from a project in the case where mitigation measures substantially fail.
- *Indirect or Secondary Impacts* – Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.

Quality of Impacts

Impacts on the cultural heritage environment are assessed in terms of their quality, i.e. positive, negative, neutral:

- Negative Impact: A change that will detract from or permanently remove a cultural heritage asset from the landscape;
- Neutral Impact: A change that does not affect cultural heritage; and

- Positive Impact: A change that improves or enhances the setting of a cultural heritage asset.

Duration of Impacts

The duration of an impact can be as follows:

- Temporary Impact: Impact lasting for one year or less;
- Short-term Impacts: Impact lasting one to seven years;
- Medium-term Impact: Impact lasting seven to fifteen years;
- Long-term Impact: Impact lasting fifteen to sixty years; and
- Permanent Impact: Impact lasting over sixty years.

Assessment of Impacts

Introduction

This assessment methodology has regard to the EPA assessment criteria (EPA 2022) and to the National Roads Authority (NRA) Guidelines for the Assessment of Archaeological Heritage Impact of National Road Schemes (NRA 2005) and Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes (NRA 2006); (hereafter referred to as the NRA Guidelines).

Cultural heritage sites are a non-renewable resource and such assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could adversely affect these sites.

Significance / Sensitivity Criteria

In accordance with EPA Guidelines (EPA 2022), the context, character, significance and sensitivity of each cultural heritage asset requires evaluation and the significance of the impact is then determined by considering the significance / sensitivity of the asset and the predicted magnitude of the impact.

In accordance with the NRA Guidelines, the significance criteria used to evaluate an archaeological site, monument or complex take into account the character and integrity of the asset and any available data regarding it. This can be ascertained by looking at the following criteria cited in the NRA Guidelines: the existing status (level of protection), condition or preservation, documentation or historical significance, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value (Table 15.1). While these criteria contribute to the significance of a feature they should not be treated as definitive. These criteria are indicators which contribute to a wider judgement based on the individual circumstances of these cultural heritage assets. The assessment was also cognisant of the draft TII guidelines for Cultural Heritage Impact Assessment of TII Projects.

The Record of Protected Structures (RPS) does not assign a grading, but those structures that are not included in the RPS may be considered to be of architectural heritage significance, though on a lower level.

The National Inventory of Architectural Heritage (NIAH) assigns a rating to all buildings included in its survey, determining each structure to be of international, national, regional or local significance. In this study any structure that is rated as of national or international significance is considered to be of a high evaluation rating. The NIAH conveys no statutory protection to buildings and other structures and hence buildings included in the NIAH do not have the same legal standing as protected structures unless

they are also included in the RPS. Any structure rated as of regional significance in the NIAH is assigned a medium level of significance for this reason.

It sometimes happens that a structure is identified in the survey that is included in neither the RPS or the NIAH and yet is considered to be of such significance that it could be worthy of inclusion as a protected structure or within the NIAH. In such cases the structure is accorded a low rating in the survey.

Finally, there are some structures that have attained a significance on account of their age but which would not be considered to be of such significance that they would warrant inclusion in the record of protected structures. In the event of any significant impact arising from the Proposed Scheme, such as demolition, these structures would be worthy of being recorded for posterity.

Table 15.1 Explanation of Archaeology and Cultural Heritage Asset Assessment Criteria

Criteria	Explanation
Existing Status	The level of protection associated with an cultural heritage asset is an important consideration.
Condition / Preservation / Integrity	The survival of an cultural heritage asset's archaeological potential both above and below ground is an important consideration and should be assessed in relation to its present condition and surviving features. Well-preserved sites should be highlighted, this assessment can only be based on a field inspection.
Documentation / Data	The significance of a cultural heritage asset may be enhanced by the existence of records of previous investigations or contemporary documentation supported by written evidence or historic maps. Sites with a definite historical association or an example of a notable event or person should be highlighted.
Group Value / Character	The value of a single cultural heritage asset may be greatly enhanced by its association with related contemporary monuments or with monuments from different periods indicating an extended time presence in any specific area. In some cases it may be preferable to protect the complete group, including associated and adjacent land, rather than to protect isolated monuments within that group.
Rarity / Character	The rarity of some cultural heritage asset types can be a central factor affecting response strategies for development, whatever the condition of the individual feature. It is important to recognise sites that have a limited distribution.
Visibility in the landscape/ Character / Integrity	Cultural heritage assets that are highly visible in the landscape have a heightened physical presence. The inter-visibility between monuments may also be explored in this category.
Fragility / Vulnerability / Integrity	It is important to assess the level of threat to a cultural heritage asset from erosion, natural degradation, agricultural activity, land clearance, neglect, careless treatment or development.
Amenity Value / Character	Regard should be taken of the existing and potential amenity value of a cultural heritage asset.

An evaluation of the significance / sensitivity of cultural heritage assets is based on their designation and on the extent to which these assets contribute to the cultural heritage environment, though their individual or group qualities, either directly or potentially. Table 15.2 presents the scale of significance

/ sensitivity together with criteria. It has been compiled by Courtney Deery Heritage Consultancy Ltd, based on standard authorities and guidelines as listed in Section 3.1. Undesignated cultural heritage sites can be assigned a low, medium or high sensitivity value, taking into consideration the criteria cited in Table 15.1 (e.g. condition, character, integrity or preservation, data, group value, rarity, visibility in the landscape, fragility or vulnerability, and amenity value).

Table 15.2 Significance / Sensitivity Criteria

Sensitivity / Significance	Criteria
Very High	Sites of international significance: World Heritage Sites and sites on the UNESCO World Heritage Tentative List.
High	National Monuments. Recorded Monuments (RMP sites & SMR sites scheduled for inclusion in the next revision of the RMP), where these are considered to be of national importance. Protected Structures (assessed by the NIAH to be of national importance), where these are also National Monuments. Undesignated cultural heritage sites.
Medium	Recorded Monuments (RMP sites & SMR sites scheduled for inclusion in the next revision of the RMP), not considered to be of national importance. Protected Structures / NIAH sites (assessed by the NIAH to be of regional importance), where these are also Recorded Monuments. Newly identified archaeological sites, confirmed through archaeological investigation, to be added to the SMR. Undesignated cultural heritage sites.
Low	Sites listed in the Meath Industrial Heritage Survey (MIHS) and National Inventory of Architectural Heritage (NIAH) Building Survey for which there are no upstanding remains. Undisturbed greenfield areas and riverine environs, which have an inherent archaeological potential. Undesignated cultural heritage sites.
Negligible	Assets with very little or no surviving cultural heritage interest.

Designated Archaeological Heritage Assets

National Monument

The National Monuments Act (1930, Section 2) defines a 'National Monument' as

> *'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto'.*

The National Monuments legislation legally protects access to and the visual amenity associated with National Monuments and requires consent from the Minister for invasive works in their vicinity.

Recorded Monuments

The primary source of information for archaeology is the Record of Monuments and Places (RMP) maintained by the Department of Housing, Local Government and Heritage (DHLGH). The RMP documents known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites in rural areas identified as cropmarks on vertical aerial photographs dating to before 1700 AD (with some later ones also being included). It is based on a comprehensive range of published and publicly available documentary and cartographic sources.

For the purpose of the assessment, the Sites and Monument Record (SMR) data and mapping as updated by the Archaeological Survey of Ireland (www.archaeology.ie) was examined.

Designated Architectural Heritage Assets

Protected Structures

A protected structure is a structure that is considered to be of 'special interest', which is broadly defined by the Planning and Development Act, 2000 as structures of architectural, historical, archaeological, artistic, cultural, scientific, social or technical point interest. The 2000 Act requires each planning authority to compile and maintain a Record of Protected Structures (RPS). The RPS is a mechanism for the statutory protection of the architectural heritage and is listed in every County Development Plan and Town Development Plan.

By definition, a protected structure includes the land lying within its curtilage and other structures within that curtilage and their interiors. The notion of curtilage is not defined by legislation, but according to Architectural Heritage Protection Guidelines for Planning Authorities (2011) it is that parcel of land immediately associated with the structure and which is (or was) in use for the purpose of the structure.

The attendant grounds of a structure are the lands outside the curtilage of the structure but which are associated with the structure and are intrinsic to its function, setting and/or appreciation.

Architectural Conservation Areas

Architectural Conservation Areas (ACA) are places, groups of structures or townscapes that are of special architectural, historical, archaeological, artistic, cultural scientific, social or technical interest/value or contribute to the appreciation of Protected Structures. ACAs and candidate ACAs are listed in every County Development Plan and Town Development Plan.

National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (NIAH) places a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The NIAH's role is to identify record and evaluate the post-1700 architectural heritage of Ireland. It aims to promote the appreciation of, and contributes to the protection of, the built heritage by systematically recording a representative sample of that built heritage on a nationwide basis. The surveys provide the basis for the recommendations of the Minister to the planning authorities for the inclusion of particular structures in the Record of Protected Structures (RPS).

Non-Designated Sites

Newly identified archaeological sites that have been confirmed through archaeological investigation (monitoring, testing, excavation, geophysical survey) are considered to be of medium importance. Such sites are undesignated as they have yet to be added to the SMR.

Potential or undesignated archaeological sites identified through aerial photography, historic mapping, stray finds are considered to be of low sensitivity, as they have yet to be ground-truthed through archaeological investigation. Similarly, undisturbed greenfield areas and riverine environs, which have an inherent but as yet unproven archaeological potential are considered to be of low sensitivity.

The NIAH Historic Garden and Designed Landscape Survey

Historic landscapes, gardens and demesnes are usually, but not always, associated with Protected Structures and therefore do not always have statutory protection. The NIAH designed landscapes and historic gardens survey is a preliminary non-statutory survey, based on a paper study using historic map sources and aerial photography, some of the sites that have been identified on it have long since been subsumed into a farming landscape particularly when the principal house has been demolished.

Magnitude of Impact

When assessing the impact magnitude, the following criteria need to be considered:

- Extent – size, scale and spatial distributions of the impact;
- Duration – period of time over which the impact will occur;
- Frequency – how often the impact will occur; and
- Context – how will the extent, duration and frequency contrast with the accepted baseline conditions (see Table 15.1)

Table 15.3 Magnitude of Impact

Effect Magnitude	Description
High	These effects arise where a cultural heritage asset is completely and irreversibly destroyed by a proposed development. A change such that the value of the asset is totally altered or destroyed, leading to a complete loss of character, integrity and data about the site.
Medium	An effect which, by its magnitude, duration or intensity alters an important / significant aspect of the environment. An effect like this would be where a cultural heritage asset would be effected upon leading to a significant loss of character, integrity and data about the site. Or an effect which by its magnitude results in the partial loss of a historic structure (including fabric loss or alteration) or grounds including the part removal of buildings or features or part removal of demesne land (e.g. severance, visual intrusion or degradation of setting and amenity). A permanent positive effect that enhances or restores the character and / or setting of a cultural heritage site in a clearly noticeable manner.
Low	A low effect arises where a change to the site is proposed which though noticeable is not such that the cultural heritage character / integrity of the site is significantly compromised, and where there is no significant loss of data about the site.

Effect Magnitude	Description
	A positive effect that results in partial enhancement of the character and / or setting of a cultural heritage site in the medium to long-term.
Negligible	An effect which causes very minor changes in the character of the environment and does not directly effect a cultural heritage asset, or affect the appreciation or significance of the asset. There would be very minor changes to the character and integrity of the asset and no loss of data about the site.

Significance of Effect

The likely significance of impacts is determined by considering the baseline rating or sensitivity value of the asset upon which the impact has an impact and the magnitude of the impact (Image 1). The impact significance is defined as Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant, or Profound (Table 15.5).

Figure 15.1 Chart Showing Typical Classifications of the Significance of Effects, from the EPA Guidelines on Information to be Contained in EIAR (EPA 2022).

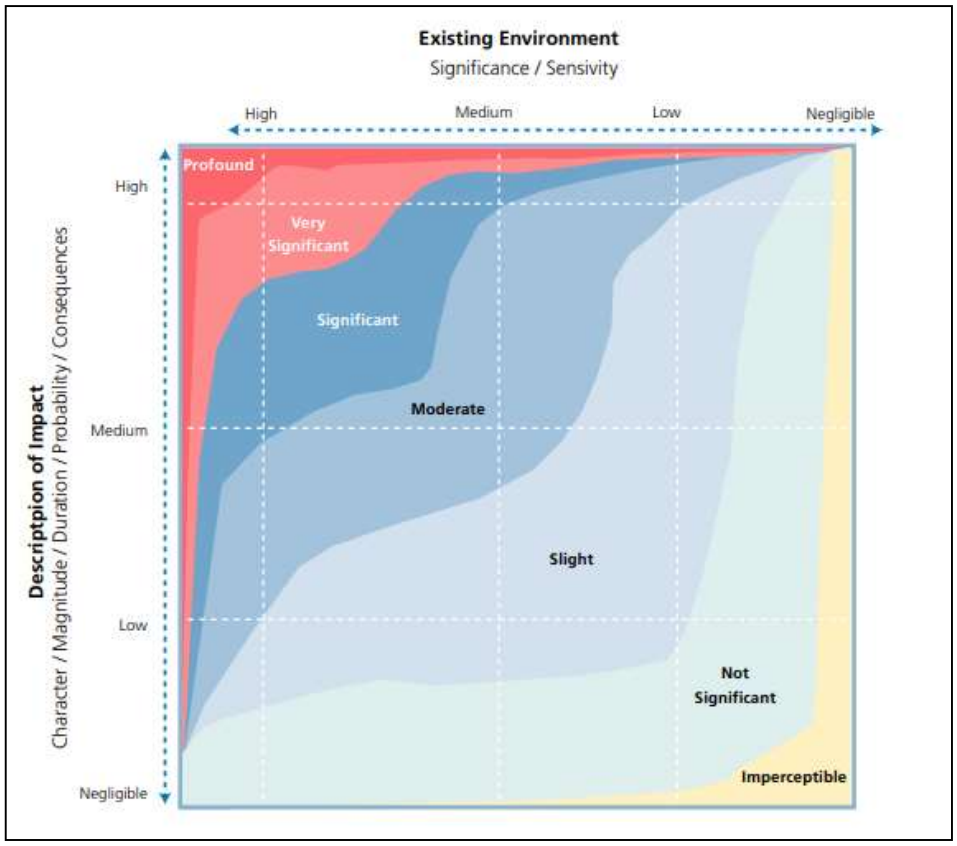

Table 15.5 Defining Significance of Impacts

Effect Significance	Criteria
Imperceptible	An effect capable of measurement but without noticeable consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes minor changes in the character of the environment and does not affect a cultural heritage asset in a moderate or significant manner.
Moderate	A moderate effect arises where a change to the site is proposed which though noticeable, does not lead to a significant loss of character, integrity and data about the cultural heritage asset.
Significant	An effect which, by its magnitude, duration or intensity, alters an important aspect of the environment. An effect like this would be where part or all of a site would be permanently effected upon, leading to a significant loss of character, integrity and data about the cultural heritage asset.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where a cultural heritage asset is completely and irreversibly destroyed by a proposed development.

Appendix 18.1 Resource and Waste Management Plan

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RESOURCE AND WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT CHURCH FIELDS EAST, MULHUDDART, DUBLIN 15

Report Prepared For

Fingal County Council

Report Prepared By

Chonaill Bradley, Principal Environmental Consultant

Our Reference

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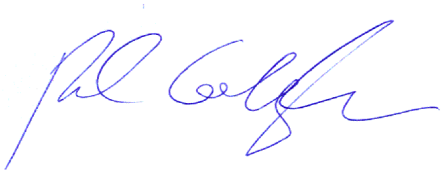
Signature		
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Date	02 June 2023	02 June 2023

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1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Resource & Waste Management Plan (RWMP) on behalf of Fingal County Council. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a combination of housing and apartment units. A total of 121 no. two and three-storey, terraced houses are proposed and 96 no. apartments in 3 four-storey blocks. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, storage, services, drainage and all associated site and infrastructural works.

This plan will provide information necessary to ensure that the management of Construction & Demolition (C&D) waste at the site is undertaken in accordance with all current legal and industry standards including the *Waste Management Act 1996* as amended and associated Regulations [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4]. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and makes recommendations for management of different waste streams. The RWMP should be viewed as a live document and should be regularly revisited throughout a project's lifecycle so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible.

2.0 C&D WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998*, Changing Our Ways* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years.

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the proposed development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), replaces the previous national waste management plan, *"A Resource Opportunity"* (2012), and was prepared in response to the 'European

Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the proposed development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [8] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [9] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* in November 2021 [10]. These guidelines replace the previous 2006 guidelines issued by The National Construction and Demolition Waste Council (NCDWC) and the Department of the Environment, Heritage and Local Government (DoEHLG) [11]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Manager (RM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and

- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a RWMP for developments. The new guidance classifies developments on a two-tiered system. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development:

- New residential development of less than 10 dwellings.
- Retrofit of 20 dwellings or less.
- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

A development which exceeds one or more of these thresholds is classed as Tier-2 projects.

This development requires a RWMP as a Tier 2 development as it is above following criterion:

- New residential development of less than 10 dwellings.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [12], published by FÁS and the Construction Industry Federation in 2002 and the previous guildines, *'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006).*

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Fingal County Council (FCC). The *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021* is the regional waste management plan to the administrative area, published in May 2015. Currently the EMR and other regional waste management plans are under review and are set to be issued as a single plan in 2023.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste"* (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste, which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015 as amended.*

The *Fingal Development Plan 2023 – 2029* [14] (2023) sets out a number of policies and objectives for the Fingal region in line with the objectives of the regional waste management plan, including the following:

- Objective **IUO34** – Waste Management in New Developments -
  Require the provision of appropriate, well designed, accessible space to support the storage, separation and collection of as many waste and recycling streams as possible in all new commercial and residential developments within the County.

- Objective **DMSO234 –** Provision of Public Bring Banks - Ensure the provision of public bring banks in all large retail developments, unless there are existing facilities within a 1 km radius. Bring bank facilities will generally be required at appropriate locations in the following development types:
  - In conjunction with significant new commercial developments, or extensions to existing developments.
  - In conjunction with new waste infrastructure facilities, proposals should include bring facilities for the acceptance of non-hazardous and hazardous wastes from members of the public and small businesses.
  - In conjunction with medium and large scale residential and mixed-use developments providing in excess of 10 residential units, proposals should provide recycling and bring bank facilities to serve residents and in some appropriate locations, the wider community.
  - In conjunction with all large retail developments provide space for reverse vending machines to promote the circular economy.

- Objective **DMSO235** – Communal Refuse Storage Provision - In the case of communal refuse storage provision, the collection point for refuse should be accessible both to the external collector and to the resident and be secured against illegal dumping by non-residents. In the case of individual houses, the applicant shall clearly show within a planning application the proposed location and design of bin storage to serve each dwelling, and having regard to the number of individual bins required to serve each dwelling at the time of the application and any possible future requirements for refuse storage/collection. The following criteria will be considered in the assessment of the design and siting of waste facilities and bring facilities:
  - The location and design of any refuse storage or recycling facility should ensure that it is easily accessible both for residents and/or public and for bin collection, be insect and vermin proofed, will not present an odour problem, and will not significantly detract from the residential amenities of adjacent property or future occupants.
  - Provision for the storage and collection of waste materials shall be in accordance with the guidelines for waste storage facilities in the relevant Regional Waste Management Plan and the design considerations contained in Section 4.8 and 4.9 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, DHLGH (2020).
  - Refuse storage for houses should be externally located, concealed / covered and adequate to cater for the size and number of bins normally allocated to a household. For terraced houses, the most appropriate area for bins to be stored is to the front of the house, which should be located in well-designed enclosures that do not to detract from visual amenity.

- All applications shall clearly identify the waste storage and collection points and detail the anticipated waste collection schedule having regard to the impact on road users both within the development and the surrounding area.
- Access to private waste storage in residential schemes should be restricted to residents only.

- Objective **DMSO236** – Segregation and Collection of Waste - Ensure all new large-scale residential and mixed-use developments include appropriate facilities for source segregation and collection of waste.

- Objective **DMSO237** – Distance from Front Door to Communal Bin Area - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened alcoves or other such mitigation measures are provided.

- Objective **DMSO239** – Refuse storage areas - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened or other such mitigation measures are provided.

- Objective **DMSO240** – Distance to Communal Bin Areas - Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres.

- Objective **DMSO241 -** Construction and Demolition Waste Management Plan - Require that Construction and Demolition Waste Management Plans be submitted as part of any planning application for projects in excess of any of the following thresholds:
  - ¨New residential development of 10 units or more.
  - ¨New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 sqm.
  - ¨Demolition / renovation / refurbishment projects generating in excess of 100m3 in volume of C&D waste.
  - ¨Civil engineering projects in excess of 500m3 of waste materials used for development of works on the site.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the proposed development are:

- Waste Management Act 1996 as amended.
- Environmental Protection Agency Act 1992 as amended.
- Litter Pollution Act 1997 as amended.
- Circular Economy and Miscellaneous Provisions Act 2022.
- Planning and Development Act 2000 as amended [14].

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* as amended and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a Waste or Industrial Emissions Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESIGN APPROACH

The client and the design team have integrated the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post construction. Further details on these design principles can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continued to be analysed and investigated throughout the design process and when selecting material.

The approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;

- Off-Site Construction;
- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);
- Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further discussed in this section. The Design Team will discuss proposed design solutions, encourage innovation in tenders and incentivise competitions to recognise sustainable approaches. They should also discuss options for packaging reduction with the main Contractor and subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste. The Green procurement extends from the planning stage into the detailed design and tender stage and will be an ongoing part of the long-term design and selection process for this development.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further considerations for procurement which are being investigated as part of the planning stage design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
    - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite as outlined in Section 2.1. This helps to reduce the environmental impacts associated with transportation of materials and from

waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

4.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Location, Size and Scale of the Proposed Development

The proposed development seeks the construction of 217 no. residential units, consisting of 121 no. houses and 96 no. apartments, ranging from 2 – 4 storeys in height, in a mixed tenure development. The development is set out as follows:

- The construction of:
  - 121 no. two and three storey houses (34 no. 2 beds, 76 no. 3 beds, & 11 no. 4 beds);
  - 3 no. four-storey apartment blocks with balconies on all elevations, green roofs, and external amenity courtyards, providing a total of 96 no. units (36 no. 1 beds, 56 no. 2 beds, & 4 no. 3 beds)
- Landscape works including:
  - provision of Class 2 open space of 7,600 sqm, private communal open space of 725 sqm, playgrounds and kick about areas;
  - new pedestrian and cycle connections to Damastown Avenue to the north; to the new Church Fields footpath cycleway to the east; and to the linear park to the south; and
  - a new pedestrian connection to Church Road and to Mulhuddart Cemetery on Church Road
- 306 no. car parking spaces (263 no. residential and 43 no. visitor spaces), including 15 accessible spaces; and 897 no. bicycle parking long term and short term spaces, including 6 no. external bike stores providing 300 bicycle spaces for the apartments, and 16 no. free-standing bike bunkers accommodating 96 no. bicycle spaces for mid-terrace houses;
- A temporary construction access to the site from Damastown Avenue;
- Associated site and infrastructural works include provision for water services, foul and surface water drainage and associated connections to the permitted Church Fields Housing and Eastern Linear Park scheme (as permitted under Plan Reg. Ref.: PARTXI/012/21); and Sustainable Drainage Systems, including permeable paving, green roofs and swales. The proposed development includes for proposed surface water drainage which is amended from that permitted under Church Fields Housing and Eastern Linear Park development.
- The proposed application includes all site enabling and development works, landscaping works, PV panels, bins stores, plant, storage, boundary treatments,

ESB substations, lighting, servicing, signage, and all site development works above and below ground.

Figure 4.2 *Proposed Site Layout Plan*

4.2 Details of the Non-Hazardous Wastes to be Produced

There will be soil and stones excavated to facilitate construction of the development. The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 9,550 m^3 of material will need to be excavated to do so. It is currently envisaged that c.7,640 m^3 of excavated will be able to be retained and reused onsite, while the remaining c. 1,910 m^3 will be removed from site. The excavated material that is deemed unsuitable or unrequired for reuse, then the material will need to be removed offsite. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Site investigations and environmental soil testing were undertaken by Ground Investigations Ireland (GII) between December 2022 and February 2023. Samples were selected from the exploratory holes for a range of environmental testing to assist in the classification of soils and to provide information for the proposed design. Environmental testing as required by the specification, including the Rilta suite testing was carried out by CMTL Geotechnical Laboratory in Portlaoise.

If any potentially contaminated material is encountered or any material is to be removed from site, it will be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [15] using the *HazWasteOnline™* tool (or similar approved classification method). The material will then be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [16], which establishes the criteria for the acceptance of waste at landfills.

In total, seven (7 No.) samples were assessed using the HazWasteOnLine™ Tool. All samples were classified as being non-hazardous. Based on the results of the HazWasteOnLine™ tool the material sampled across the site if being considered a waste can be classified as non-hazardous

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos will be taken to a suitably licensed or permitted facility. Due to the nature of the site being green field it is not envisaged that ACM will be encountered onsite.

Asbestos fibres were not detected in the samples. The laboratory did not identify asbestos containing materials (ACMs) in the samples.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify FCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are

trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

4.3.3 Invasive Plant Species

A site survey was undertaken by the Brady Shipman Martin (Project Ecologists). This included a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended.

No Japanese Knotweed or any third schedule invasive species were detected. If any third schedule invasive species is detected during the construction phase of the development, then an invasive species management plan will be produced and submitted to FCC.

4.3.4 Asbestos

If ACMs are detected on site, the removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACMs will only be removed from site by a suitably permitted/licenced waste contractor. in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*. All material will be taken to a suitably licensed or permitted facility. It is not envisaged that ACM's will be encountered due to the nature of the site being a greenfield site.

4.3.5 Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

5.0 ROLES AND RESPONSIBILITIES

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a RM should be appointed. The RM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The RM is assigned the requisite authority to meet the objective and obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client are the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of a preliminary RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client will ensure that the RWMP is agreed on and submitted to the local authority prior to commencement of works on site;
- The Client is to request the end-of-project RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- Appointing a RM to track and document the design process, inform the Design Team and prepare the RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This should also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Handing over of the RWMP to the selected Contractor upon commencement of construction of the proposed development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The future construction contractors have not yet been decided upon for this RWMP. However, once selected they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the construction phase (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- Applying for the appropriate waste permit to crush concrete onsite;

- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a 'waste' must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) should be maintained for the duration of the project; and
- Preparing a RWMP Implementation Review Report at project handover.

6.0 KEY MATERIALS & QUANTITIES

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information should be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that may be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m^3) of waste generated per construction value;
- Weight (tonnes) or Volume (m^3) of waste generated per construction floor area (m^2);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

6.2 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (applicable as of 1 June 2015) for each waste stream is also shown.

Table 6.1 *Typical waste types generated and LoW codes (individual waste types may contain hazardous substances)*

Waste Material	LoW Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

** Individual waste type may contain hazardous substances*

6.3 Demolition Waste Generation

There is no demolition associated with the proposed development as the development site is greenfield.

6.4 Construction Waste Generation

Table 6.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* [17] *and the joint EPA & GMIT study* [18].

Table 6.2 *Waste materials generated on a typical Irish construction site*

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 6.3, below, shows the estimated construction waste generation for the project based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 6.2. These have been calculated from the schedule of development areas provided by the architect.

Table 6.3 *Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	415.6	10	41.6	80	332.5	10	41.6
Timber	352.6	40	141.1	55	194.0	5	17.6
Plasterboard	125.9	30	37.8	60	75.6	10	12.6
Metals	100.8	5	5.0	90	90.7	5	5.0
Concrete	75.6	30	22.7	65	49.1	5	3.8
Other	188.9	20	37.8	60	113.4	20	37.8
Total	**1259.4**		**285.9**		**855.2**		**118.4**

In addition to the waste streams in Table 6.3, there will be c. 9,550 m^3 of soil and stone excavated to facilitate the construction of new foundations and underground services. It is currently envisaged that c. 7,640 m3 of excavated material will be able to be retained and reused onsite, while the remaining c. 1,910 m3 will be removed from site. If any of the excavated material is deemed unsuitable for reuse or not required, then the material will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

6.5 Proposed Resource and Waste Management Options

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible. All waste receptacles leaving the site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Fingal region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly

involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR / permit / licence for the receiving waste facility for all waste removed off-site for appropriate reuse, recycling, recovery and / or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

Soil and Stone

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

It is envisaged that all excavated material will be reused on site. If material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Regulation 15 (By-products) (previously Article 27) of European Union (Waste Directive) Regulations 2011-2020, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Regulation 27. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Regulation 27. Regulation 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Act 1996* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Silt & Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-site.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If concrete is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-site.

Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site Manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

Other Recyclables

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 8.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

If any asbestos or ACMs are found on-site they will be removed by a suitably competent contractor and disposed of as asbestos waste before works begin. All asbestos removal work or encapsulation work must be carried out in accordance with *S.I. No. 589 of 2010 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.*

Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from FCC and the destination of the accepting waste facility will be supplied to the FCC waste unit.

6.6 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by a weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM (see Section 9.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Act 1996* as amended, *Waste Management (Collection*

Permit) Regulations 2007 as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RM (see Section 8.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR / permit or EPA Waste / Industrial Emissions Licence for that site will be provided to the nominated project RM (see Section 8.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all Local Authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences, etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered in a waste management recording system to be maintained on-site.

7.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is outlined below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

7.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle / recovery / disposal costs associated with the requirement for a waste contractor to take the material off-site. Clean and inert soils, gravel, stones, etc., which cannot be reused on-site may be used as access roads or capping material for landfill sites, etc. This material is often taken free of charge or at a reduced fee for such purposes, reducing final waste disposal costs.

7.2 Recycling

Salvageable metals will earn a rebate, which can be offset against the costs of collection and transportation of the skips.

Clean, uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes, such as timber, from a site than mixed waste.

7.3 Disposal

Landfill charges are currently at around €130 - €150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the

remainder to landfill. Clean soil, rubble, etc., is also used as fill / capping material, wherever possible.

8.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the RM to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the development.

8.1 Resource Manager Training and Responsibilities

The nominated RM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The RM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the RM to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The RM will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The RM will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this RWMP.

8.2 Site Crew Training

Training of site crew in relation to waste is the responsibility of the RM and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

9.0 TRACKING AND TRACING / RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on Site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or RM with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the

security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- Waste Quantity
- EWC / LoW

The waste vehicle will be checked by security personal or the RM to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the RM on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the FCC Waste Regulation Unit when requested.

Each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically checked by the RM. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

10.0 OUTLINE WASTE AUDIT PROCEDURE

10.1 Responsibility for Waste Audit

The appointed RM will be responsible for conducting a waste audit at the site during the C&D phase of the project. Contact details for the nominated RM will be provided to the FCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

10.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the construction phase of the project.

If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

11.0 CONSULTATION WITH RELEVANT BODIES

11.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the FCC Waste Regulation Unit.

FCC will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

11.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-site, and the recycling / reclamation process each material will undergo off-site.

11.3 Pest Management

A pest control operator will be appointed as required to manage pest onsite during the construction phase of the project. Organic and food wastes generated by staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

11.4 C&D ENVIRONMENTAL MITIGATION MEASURES

During the Construction phase the project Construction Environmental Management Plan (CEMP) will be followed in regard to implementing and managing all environmental management requirements.

This CEMP explains the construction techniques and methodologies which will be implemented during construction of the proposed development.

The CEMP mitigation measures will be implemented to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP will be implemented and adhered to by the construction contractors and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, RM and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures.

12.0 CONCLUSION

Adherence to this plan will also ensure that waste management during the construction phase, at the development is carried out in accordance the requirements in the EPA's Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects, and the FCC Waste Bye-Laws.

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Appendix 18.2 Operational Waste Management Plan

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OPERATIONAL WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT CHURCH FIELDS EAST, MULHUDDART, DUBLIN 15

Report Prepared For

Fingal County Council

Report Prepared By

Chonaill Bradley, Principal Environmental Consultant

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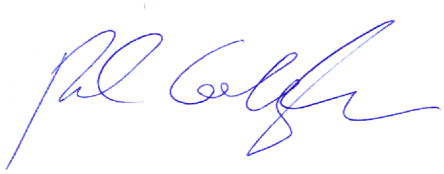
Signature		
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CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Operational Waste Management Plan (OWMP) on behalf of Fingal County Council. The proposed development seeks the construction of 217 no. residential units (ranging from 2 – 4 storeys in height) in a combination of housing and apartment units. A total of 121 no. two and three-storey, terraced houses are proposed and 96 no. apartments in 3 four-storey blocks. The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, storage, services, drainage and all associated site and infrastructural works.

This OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed development is undertaken in accordance with the current legal and industry standards including, the *Waste Management Act 1996* as amended [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3], the *'Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021'* [4] and Fingal County Council (FCC) 'Fingal County Council Segregation, Storage and Presentation of household and Commercial Waste Bye-Laws' (2020) [5]. In particular, this OWMP aims to provide a robust strategy for the storage, handling, collection and transport of the wastes generated at Site.

This OWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. The OWMP also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources). The plan estimates the type and quantity of waste to be generated from the development during the operational phase and provides a strategy for managing the different waste streams.

At present, there are no specific guidelines in Ireland for the preparation of OWMPs. Therefore, in preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

2.0 OVERVIEW OF WASTEMANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998 titled as *'Changing Our Ways* [6] which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, Changing Our Ways stated a target of at least 35% recycling of municipal (i.e. household, commercial and non-process industrial) waste.

A further policy document *'Preventing and Recycling Waste – Delivering Change'* was published in 2002 [7]. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'* [8]. This document also stressed the need to break the link between economic growth and waste generation, again through waste minimisation and reuse of discarded material.

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'* [9]. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

In September 2020, the Irish Government published a new policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan 'A Waste Action Plan for a Circular Economy' [10] (WAPCE), was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and environmental challenges are turned into opportunities, replacing the previous national waste management plan "A Resource Opportunity" (2012).

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [11] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The *Circular Economy and Miscellaneous Provisions Act 2022* [12] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic 'National Waste (Database) Reports' [13] detailing, among other things, estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The 2020 National Waste Statistics, which is the most recent study published, along with the national waste statistics web resource (December 2022) reported the following key statistics for 2019:

- **Generated –** Ireland produced 3,210,220 t of municipal waste in 2020. This is a 4% increase since 2019. This means that the average person living in Ireland generated 645 kg of municipal waste in 2020.
- **Managed –** Waste collected and treated by the waste industry. In 2020, a total of 3,180,620 t of municipal waste was managed and treated.
- **Unmanaged –**Waste that is not collected or brought to a waste facility and is, therefore, likely to cause pollution in the environment because it is burned, buried or dumped. The EPA estimates that 29,600 t was unmanaged in 2020.
- **Recovered –** The amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2020, around 84% of municipal waste was recovered – an increase from 83% in 2019.
- **Recycled –** The waste broken down and used to make new items. Recycling also includes the breakdown of food and garden waste to make compost. The recycling rate in 2020 was 41%, which is up from 37% in 2019.
- **Disposed –** 16% of municipal waste was landfilled in 2020. This is an increase from 15% in 2019.

2.2 Regional Level

The proposed development is located in the Local Authority area of FCC. The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the FCC area published in May 2015. Currently the EMR and other regional waste management plans are under review and the Regional Waste Management Planning Offices expect to publish the final plan in 2022.

The current regional plan sets out the following strategic targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015 as amended.*

The *Fingal Development Plan 2023 – 2029* [14] (2023) sets out a number of policies and objectives for the Fingal region in line with the objectives of the regional waste management plan, including the following:

- Objective **IUO34** – Waste Management in New Developments -
  Require the provision of appropriate, well designed, accessible space to support the storage, separation and collection of as many waste and recycling streams as possible in all new commercial and residential developments within the County.

- Objective **DMSO234 –** Provision of Public Bring Banks - Ensure the provision of public bring banks in all large retail developments, unless there are existing facilities within a 1 km radius. Bring bank facilities will generally be required at appropriate locations in the following development types:
  - In conjunction with significant new commercial developments, or extensions to existing developments.

- In conjunction with new waste infrastructure facilities, proposals should include bring facilities for the acceptance of non-hazardous and hazardous wastes from members of the public and small businesses.
- In conjunction with medium and large scale residential and mixed-use developments providing in excess of 10 residential units, proposals should provide recycling and bring bank facilities to serve residents and in some appropriate locations, the wider community.
- In conjunction with all large retail developments provide space for reverse vending machines to promote the circular economy.

- Objective **DMSO235** – Communal Refuse Storage Provision - In the case of communal refuse storage provision, the collection point for refuse should be accessible both to the external collector and to the resident and be secured against illegal dumping by non-residents. In the case of individual houses, the applicant shall clearly show within a planning application the proposed location and design of bin storage to serve each dwelling, and having regard to the number of individual bins required to serve each dwelling at the time of the application and any possible future requirements for refuse storage/collection. The following criteria will be considered in the assessment of the design and siting of waste facilities and bring facilities:
  - The location and design of any refuse storage or recycling facility should ensure that it is easily accessible both for residents and/or public and for bin collection, be insect and vermin proofed, will not present an odour problem, and will not significantly detract from the residential amenities of adjacent property or future occupants.
  - Provision for the storage and collection of waste materials shall be in accordance with the guidelines for waste storage facilities in the relevant Regional Waste Management Plan and the design considerations contained in Section 4.8 and 4.9 of the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, DHLGH (2020).
  - Refuse storage for houses should be externally located, concealed / covered and adequate to cater for the size and number of bins normally allocated to a household. For terraced houses, the most appropriate area for bins to be stored is to the front of the house, which should be located in well-designed enclosures that do not to detract from visual amenity.
  - All applications shall clearly identify the waste storage and collection points and detail the anticipated waste collection schedule having regard to the impact on road users both within the development and the surrounding area.
  - Access to private waste storage in residential schemes should be restricted to residents only.

- Objective **DMSO236** – Segregation and Collection of Waste - Ensure all new large-scale residential and mixed-use developments include appropriate facilities for source segregation and collection of waste.

- Objective **DMSO237** – Distance from Front Door to Communal Bin Area - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened alcoves or other such mitigation measures are provided.

- Objective **DMSO239** – Refuse storage areas - Ensure all new residential schemes include appropriate design measures for refuse storage areas, details of which should be clearly shown at pre-planning and planning application

stage. Ensure refuse storage areas are not situated immediately adjacent to the front door or ground floor window, unless adequate screened or other such mitigation measures are provided.

- Objective **DMSO240** – Distance to Communal Bin Areas - Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 as amended;
- Environmental Protection Agency Act 1992 as amended;
- Litter Pollution Act 1997 as amended; and
- Planning and Development Act 2000 as amended [16]
- Circular Economy and Miscellaneous Provisions Act 2022.

These Acts and subordinate Regulations enable the transposition of relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* as amended and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

It is therefore imperative that the residents and facilities management company undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport and reuse/recover/recycle/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended or a waste or IED (Industrial Emissions Directive) licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

2.3.1 Fingal County Council Waste Bye-Laws

The FCC *"Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws 2020"* came into effect in March 2020. The Bye-Laws set a number of enforceable requirements on waste holders and collectors with regard to storage, separation, presentation and collection of waste within the FCC functional area. Key requirements under these *Waste Bye-Laws* are:

- Kerbside waste presented for collection shall not be presented for collection earlier than 6:00pm on the day immediately preceding the designated waste collection day;

- All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 9:00am on the day following the designated waste collection day;

- Neither recyclable household kerbside waste nor food waste arising from households shall be contaminated with any other type of waste before or after it has been segregated; and

- A management company, or another person if there is no such company, who exercises control and supervision of residential and/or commercial activities in multi-unit developments, mixed-use developments, flats or apartment blocks, combined living/working spaces or other similar complexes shall ensure that:
    - Separate receptacles of adequate size and number are provided for the proper segregation, storage and collection of recyclable household kerbside waste and residual household kerbside waste;
    - Additional receptacles are provided for the segregation, storage and collection of food waste where this practice is a requirement of the national legislation on food waste;
    - The receptacles referred to in paragraphs (a) and (b) are located both within any individual apartment and at the place where waste is stored prior to its collection;
    - Any place where waste is to be stored prior to collection is secure, accessible at all times by tenants and other occupiers and is not accessible by any other person other than an authorised waste collector,
    - Written information is provided to each tenant or other occupier about the arrangements for waste separation, segregation, storage and presentation prior to collection;
    - An authorised waste collector is engaged to service the receptacles referred to in this section of these bye-laws, with documentary evidence, such as receipts, statements or other proof of payment, demonstrating the existence of this engagement being retained for a period of no less than two years. Such evidence shall be presented to an authorised person within a time specified in a written request from either that person or from another authorised person employed by Fingal County Council;
    - Receptacles for kerbside waste are presented for collection on the designated waste collection day; and
    - Adequate access and egress onto and from the premises by waste collection vehicles is maintained.

The full text of the Waste Bye-Laws is available from the FCC website

2.4 Regional Waste Management Service Providers and Facilities

Various contractors offer waste collection services for the residential sectors in the FCC region. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

As outlined in the regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There

are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

The Coolmine Recycling Centre, Coolmine Industrial Estate, Fingal, Dublin D15F7X9, is located c. 5.1 km southeast of the development site and can be utillised by residents of the development for other household waste streams. This centre can accept paper, cardboard, glass, WEEE, light bulbs, cooking and engine oil, bulky waste (e.g. furniture), wood, metal, green waste and household hazardous waste (paint, herbicides etc.). There is also a bring bank located c. 3.2 km southwest of the development site at Littlepace Shopping Centre, where glass and aluminium cans can be deposited.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all waste/IED licenses issued are available from the EPA.

3.0 DESCRIPTION OF THE PROJECT

3.1 Size and Scale of the Development

The proposed development seeks the construction of 217 no. residential units, consisting of 121 no. houses and 96 no. apartments, ranging from 2 – 4 storeys in height, in a mixed tenure development. The development is set out as follows:

- The construction of:
  - 121 no. two and three storey houses (34 no. 2 beds, 76 no. 3 beds, & 11 no. 4 beds);
  - 3 no. four-storey apartment blocks with balconies on all elevations, green roofs, and external amenity courtyards, providing a total of 96 no. units (36 no. 1 beds, 56 no. 2 beds, & 4 no. 3 beds)
- Landscape works including:
  - provision of Class 2 open space of 7,600 sqm, private communal open space of 725 sqm, playgrounds and kick about areas;
  - new pedestrian and cycle connections to Damastown Avenue to the north; to the new Church Fields footpath cycleway to the east; and to the linear park to the south; and
  - a new pedestrian connection to Church Road and to Mulhuddart Cemetery on Church Road
- 306 no. car parking spaces (263 no. residential and 43 no. visitor spaces), including 15 accessible spaces; and 897 no. bicycle parking long term and short term spaces, including 6 no. external bike stores providing 300 bicycle spaces for the apartments, and 16 no. free-standing bike bunkers accommodating 96 no. bicycle spaces for mid-terrace houses;
- A temporary construction access to the site from Damastown Avenue;
- Associated site and infrastructural works include provision for water services, foul and surface water drainage and associated connections to the permitted Church Fields Housing and Eastern Linear Park scheme (as permitted under Plan Reg. Ref.: PARTXI/012/21); and Sustainable Drainage Systems, including permeable paving, green roofs and swales. The proposed development includes for proposed surface water drainage which is amended from that permitted under Church Fields Housing and Eastern Linear Park development.
- The proposed application includes all site enabling and development works, landscaping works, PV panels, bins stores, plant, storage, boundary treatments, ESB substations, lighting, servicing, signage, and all site development works above and below ground.

3.2 Typical Waste Categories

The typical non-hazardous and hazardous wastes that will be generated at the Proposed Development will include the following:

- Dry Mixed Recyclables (DMR) - includes waste paper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants/flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green/garden waste may be generated from internal plants or external landscaping;
- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges/toners;
- Chemicals (paints, adhesives, resins, detergents, etc.) ;
- Lightbulbs;
- Textiles (rags);
- Waste cooking oil (if any generated by the residents or crèche tenants);
- Furniture (and from time to time other bulky wastes); and
- Abandoned bicycles.

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

3.3 European Waste Code

In 1994, the *European Waste Catalogue* [17] and *Hazardous Waste List* [18] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [19], which was a condensed version of the original two documents and their subsequent amendments. This document has recently been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [20] which became valid from the 1st June 2015 and has been amended in 2018 & 2019. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code (also referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the Proposed Development are provided in Table 3.1 below.

Table 3.1 Typical Waste Types Generated and LoW Codes

Waste Material	LoW Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40

Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

** Individual waste type may contain hazardous materials*

4.0 ESTIMATED WASTE ARISINGS

A waste generation model (WGM) developed by AWN, has been used to predict waste types, weights and volumes arising from operations within the proposed development. The WGM incorporates building area and use and combines these with other data including Irish and US EPA waste generation rates.
The estimated quantum/volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units.

The estimated waste generation for the development for the main waste types is presented in Tables 4.1

Table 4.1 Estimated waste generation for the proposed development for the main waste types

Waste type	Waste Volume (m^3/week)				
	Apartment Block D & F (Per Block)	Apartment Block E	2 Bedroom House (Individual)	3 Bedroom House (Individual)	4 Bedroom House (Individual)
Organic Waste	0.48	0.49	0.02	0.02	0.02
DMR	3.38	3.45	0.12	0.14	0.18
Glass	0.09	0.09	> 0.00	> 0.00	> 0.00
MNR	1.78	1.81	0.06	0.07	0.09
Total	**5.73**	**5.84**	**0.20**	**0.23**	**0.29**

BS5906:2005 Waste Management in Buildings – Code of Practice [21] has been considered in the calculations of waste estimates. AWN's modelling methodology is based on recently published data and data from numerous other similar developments in Ireland and is based on AWN's experience. It provides a more representative estimate of the likely waste arisings from the proposed development.

5.0 WASTE STORAGE AND COLLECTION

This section provides information on how waste generated within the development will be stored and how the waste will be collected from the development. This has been prepared with due consideration of the proposed site layout as well as best practice standards, local and national waste management requirements including those of FCC. In particular, consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice;
- EMR Waste Management Plan 2015 – 2021;
- *Fingal County Council Development Plan 2023 – 2028* (2023);

- Fingal County Council *Segregation Storage, Presentation and of Household and Commercial Waste (2020);* and
- DoHLGH*, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (sections 4.8 & 4.9)* (2022) [22]

Apartment Blocks

One (1 no.) shared Waste Storage Area (WSA) has been allocated for use by residents for each of the apartment blocks (Block D, E & F). This WSAs are located at ground floor level in an external location. All Locations for the shared WSAs can be viewed on the drawings submitted with the planning application or in Appendix A of this report.

Individual Houses

Houses will have their own individual WSAs allocated at the rear of their home where external access to the rear yard is possible. In houses where external access to the rear of the property is unavailable, bins will be stored at the front of the unit in an external bin store, shielded from view of the road.

Using the estimated waste generation volumes in Table 4.1, the waste receptacle requirements for MNR, DMR, organic waste and glass have been established for the WSAs. All waste types will be collected on a weekly basis. These are presented in Table 5.1.

Table 5.1 Waste storage requirements for the proposed development

Area/Use	Bins Required			
	MNR*	DMR**	Organic	Glass
Apartment Block D (Combined)	2 x 1100 L	3 x 1100 L 1 x 240L	2 x 240 L	1 x 240 L
Apartment Block E (Combined)	2 x 1100 L	3 x 1100 L 1 x 240L	2 x 240 L	1 x 240 L
Apartment Block F (Combined)	2 x 1100 L	3 x 1100 L 1 x 240L	2 x 240 L	1 x 240 L
2 – Bedroom House (Individual)	1 x 240L	1 x 240L	1 x 120L	Bring bank
3 – Bedroom House (Individual)	1 x 240L	1 x 240L	1 x 120L	Bring bank
4 – Bedroom House (Individual)	1 x 240L	1 x 240L	1 x 120L	Bring bank

*Note: * = Mixed Non-Recyclables*
*** = Dry Mixed Recyclables*

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type.

Mixed non-recyclable waste, dry mixed recyclable waste and organic waste will be collected weekly by the nominated waste contractor. Glass will be collected weekly from the shared WSAs. It will be the responsibility of the residents in each individual house unit to dispose of their glass waste at a bottle bank.

Waste storage receptacles as per Table 5.1 above (or similar appropriate approved containers) will be provided by the facilities management company in the shared residential WSAs.

It will be the responsibility of the individual houses to contact a waste contractor to acquire the appropriate waste storage receptacles (as per Table 5.1 above, or similar

appropriately approved containers), which will be provided by the waste contactor for that individual unit.

The types of bins used will vary in size, design and colour dependent on the appointed waste contractor. However, examples of typical receptacles to be provided are shown in Figure 5.1. All waste receptacles used will comply with the SIST EN 840-1:2020 and SIST EN 840-2:2020 standards for performance requirements of mobile waste containers, where appropriate.

Figure 5.1 Typical waste receptacles of varying size (240L and 1100L)

Receptacles for organic, mixed dry recyclable, glass and mixed non-recyclable waste will be provided in the shared WSAs prior to first occupation of the development i.e. prior to the first residential unit or the crèche unit being occupied.

This Plan will be provided to each resident from first occupation of the development i.e. once the first residential unit is occupied. This Plan will be supplemented, as required, by the facilities management company with any new information on waste segregation, storage, reuse and recycling initiatives that are subsequently introduced.

5.1 Waste Storage – Apartment Units

Residents will be required to segregate their waste into the following main waste categories within their own units:

- Organic waste;
- DMR;
- Glass; and
- MNR

Provision will be made in all residential units to accommodate 3 no. bin types to facilitate waste segregation at source. An example of a potential 3 bin storage system is provided in Figure 5.2 below.

Figure 5.2 Example three bin storage system to be provided within the unit design

Residents will be required to take their segregated waste materials to their designated WSA and deposit their segregated waste into the appropriate bins. The locations of the shared residential WSAs are illustrated in the drawings submitted with the planning application under separate cover and in Appendix A of this report.

Each bin / container in the shared residential WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin.

Access to the shared residential WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access.

Other waste materials such as textiles, batteries, printer toner/cartridges, waste cooking oil and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.2 Waste Storage – Houses

Residents in houses will be required to segregate their waste into the following waste categories within their own units:

- Organic waste;
- DMR
- Glass; and
- MNR.

Provision will be made in all residential units to accommodate 3 no. bin types to facilitate waste segregation at source. An example of a potential 3 bin storage system is provided in Figure 5.2 above.

Houses will have their own individual WSAs allocated at the rear of their home where external access to the rear yard is possible. In houses where external access to the rear of the property is unavailable, bins will be stored at the front of the unit in an external bin store, shielded from view of the road.

Residents will be required to place their segregated waste materials into these bins as necessary.

Other waste materials such as textiles, batteries, printer toner/cartridges and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.3 Waste Collection

There are numerous private contractors that provide household waste collection services in the Fingal area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered/permitted/licensed facilities only.

Bins from shared residential WSAs will be brought to a collection area adjacent to the external WSAs, by facilities management or the waste contractor immediately prior to collection. Bins will be returned to their respective WSAs immediately following collection.

The collection areas are such that they will not obstruct traffic or pedestrians (allowing a footway path of at least 1.8m, the space needed for two wheelchairs to pass each other) as is recommended in the Design Manual for Urban Roads and Streets (2019) [21]. A Road Sweep Analysis for the waste collection vehicle can be found in Appendix B of this report

Residents in houses with their own individual WSAs will be responsible for moving their waste receptacles to and from the curb before and after collection.

It is recommended that bin collection times/days are staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is onsite. This will be determined during the process of appointment of a waste contractor.

5.4 Additional Waste Materials

In addition to the typical waste materials that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. A non-exhaustive list is presented below.

<u>Green/garden waste</u>
Green/garden waste may be generated from internal plants/flowers. Green waste generated from internal plants/flowers can be placed in the organic waste bins in the WSA. If substantial green waste is produced in common areas, it can be removed by a landscape contractor.

<u>Batteries</u>
A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place in order to comply with the S.I. No. 283/2014 - European Union (Batteries and Accumulators) Regulations 2014, as amended. In accordance with these regulations, consumers are able to bring their waste batteries to their local civic amenity / recycling centre or can return them free of charge to retailers which supply the equivalent type of battery, regardless of whether or not the batteries were purchased at the retail outlet and regardless of whether or not the person depositing the waste battery purchases any product or products from the retail outlet.

Waste Electrical and Electronic Equipment (WEEE)

The WEEE Directive (Directive 2002/96/EC) and associated Waste Management (WEEE) Regulations have been enacted to ensure a high level of recycling of electronic and electrical equipment. In accordance with the regulations, consumers can bring their waste electrical and electronic equipment to their local civic amenity / recycling centre. In addition, consumers can bring back WEEE within 15 days to retailers when they purchase new equipment on a like for like basis. Retailers are also obliged to collect WEEE within 15 days of delivery of a new item, provided the item is disconnected from all mains, does not pose a health and safety risk and is readily available for collection.

Printer Cartridge/Toners

Waste printer cartridge / toners generated by residents can usually be returned to the supplier free of charge or can be brought to a civic amenity / recycling centre.

Chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc)

Chemicals (such as solvents, paints, adhesives, resins, detergents, etc) are largely generated from building maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery / recycling / disposal of any waste materials generated.

Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents should be brought to a civic amenity / recycling centre.

Light Bulbs

Light bulbs generated by residents should be taken to the nearest civic amenity / recycling centre for appropriate storage and recovery / disposal.

Textiles

Where possible, waste textiles should be recycled or donated to a charity organisation for reuse. The residents will be responsible for disposing of waste textiles appropriately.

Waste Cooking Oil

If the residents generate waste cooking oil, this can be brought to a civic amenity / recycling centre or placed in the organic bin.

Furniture (and other bulky wastes)

Furniture and other bulky waste items (such as carpet, etc.) may occasionally be generated by the residents. If residents wish to dispose of furniture, this can be brought a civic amenity / recycling centre.

Abandoned Bicycles

Bicycle parking areas are planned for the development. As happens in other developments, residents sometimes abandon faulty or unused bicycles and it can be difficult to determine their ownership. Where appropriate, abandoned bicycles should be donated to charity if they arise.

Please note that this guidance is likely to be updated by the time the proposed development is open and occupied and the relevant guidance at the time will need to be reviewed.

5.1 Waste Storage Area Design

The shared residential WSAs and café WSA will be designed and fitted-out to meet the requirements of relevant design Standards, including:

- Be fitted with a non-slip floor surface;
- Provide ventilation to reduce the potential for generation of odours;
- Provide suitable lighting – a minimum Lux rating of 400 is recommended;
- Appropriate sensor controlled lighting;
- Be easily accessible for people with limited mobility;
- Be restricted to access by nominated personnel only;
- Be supplied with hot or cold water for disinfection and washing of bins;
- Be fitted with suitable power supply for power washers;
- Have a sloped floor to a central foul drain for bins washing run-off;
- Have appropriate graphical and written signage placed above and on bins indicating correct use;
- Have access for potential control of vermin, if required;
- Robust design of doors to bin area incorporating steel sheet covering where appropriate; and
- Be fitted with CCTV for monitoring.

The facility management company will be required to maintain bins and storage areas in good condition as required by the DLRCC *Waste Bye*-Laws.

5.2 Facility Management Responsibilities

It shall be the responsibility of the Facilities Management Company to ensure that all domestic waste generated by apartment residents is managed to ensure correct storage prior to collection by an appropriately permitted waste management company.

Facilities Management should provide the following items:

- Provision of a Waste Management Plan document, prepared by the Facilities Management Company to all residential units, which shall clearly state the methods of source waste segregation, storage, reuse and recycling initiatives that shall apply to the management of the development;
- Provision and maintenance of appropriate graphical signage to inform residents of their obligation to reduce waste, segregate waste and in the correct bin;
- Preparation of an annual waste management report for all residential units;
- Designation of access routes to common waste storage areas to ensure safe access from the apartment units by mobility impaired persons;
- Provision of an appropriately qualified and experienced staff member, who will be responsible for all aspects of waste management at the development;
- Daily inspection of waste storage areas and signing of a daily check list, which shall be displayed within the area; and
- Maintenance of a register, detailing the quantities and breakdown of wastes collected from the development and provision of supporting documentation by the waste collector to allow tracking of waste recycling rates.

6.0 CONCLUSIONS

In summary, this OWMP presents a waste strategy that addresses all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the development.

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*.

Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the requirements of the *FCC Waste Bye-Laws.*

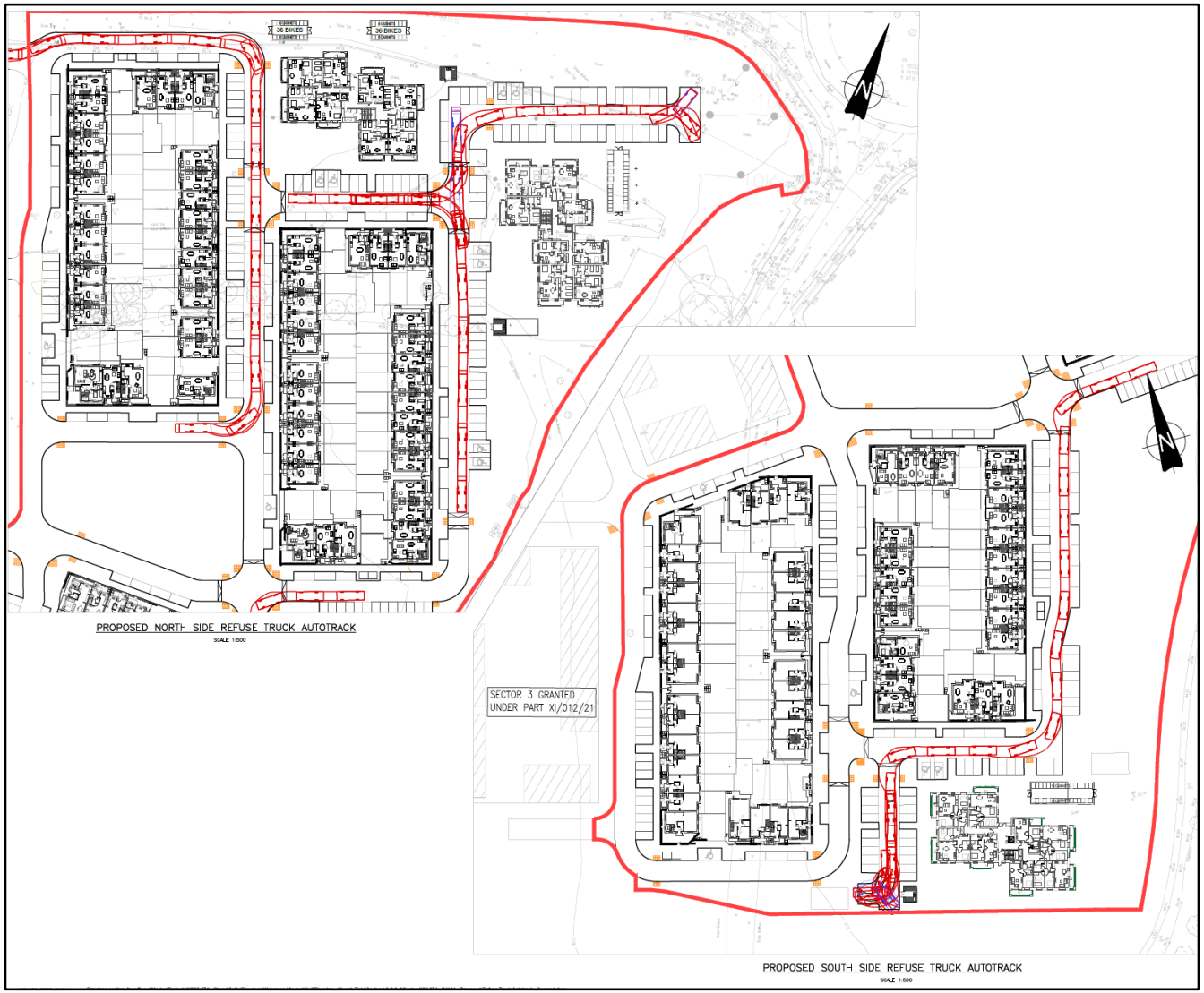
The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated area for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

7.0 REFERENCES

1. Waste Management Act 1996 (S.I. No. 10 of 1996) as amended.
2. Environmental Protection Agency Act 1992, as amended.
3. Litter Pollution Act 1997 as amended.
4. Eastern-Midlands Waste Region, *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021* (2015).
5. Fingal County Council *'Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws'* (2020).
6. Department of Environment and Local Government (DoELG) Waste Management – Changing Our Ways, A Policy Statement (1998).
7. Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002).
8. DoELG, Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development) (2002).
9. DoEHLG, *Taking Stock and Moving Forward* (2004).
10. Department of Communications, Climate Action and Environment (DoCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
11. DoECLG, A Resource Opportunity - Waste Management Policy in Ireland (2012).
12. Circular Economy and Miscellaneous Provisions Act 2022.
13. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2018.*
14. FCC*, Fingal County Development Plan 2023 – 2029* (2023).
15. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
16. European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
17. Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
18. EPA, *European Waste Catalogue and Hazardous Waste List* (2002).
19. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018).
20. BS 5906:2005 Waste Management in Buildings – Code of Practice.
21. DoHLGH*, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (2022).
22. Department of Transport, Tourism and Sport and Department of Housing, Planning and Local Government, Design Manual for Urban Roads and Streets (2022)

APPENDIX A – Shared Waste Storage Area Locations

APPENDIX B – Road Sweep Analysis (Waste Vehicle)



Appendix 19.1 Utility Maps

A3

PLANT REQUESTED FROM eircom emaps CBYD SERVICE

https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 306965 m, 241407 m

Date
17/08/2020

emaps CBYD

A3

PLANT REQUESTED FROM eircom emaps CBYD SERVICE

https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Date 17/08/2020

Irish National Grid Co-Ordinates
Centre XY: 306883 m, 241262 m

emaps CBYD

A3

PLANT REQUESTED FROM eircom emaps CBYD SERVICE

https://cbyd.emaps.eircom.ie/

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 306788 m, 241376 m

Date
17/08/2020

emaps CBYD

ESB Networks

TITLE:

20200817-038_A0

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 17-Aug-2020

** SCALE: 1:1500

** SCALE WHEN PRINTED ON AN A0 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1850 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING:
(A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

X,Y: 306035, 242088

X,Y: 307774, 242088

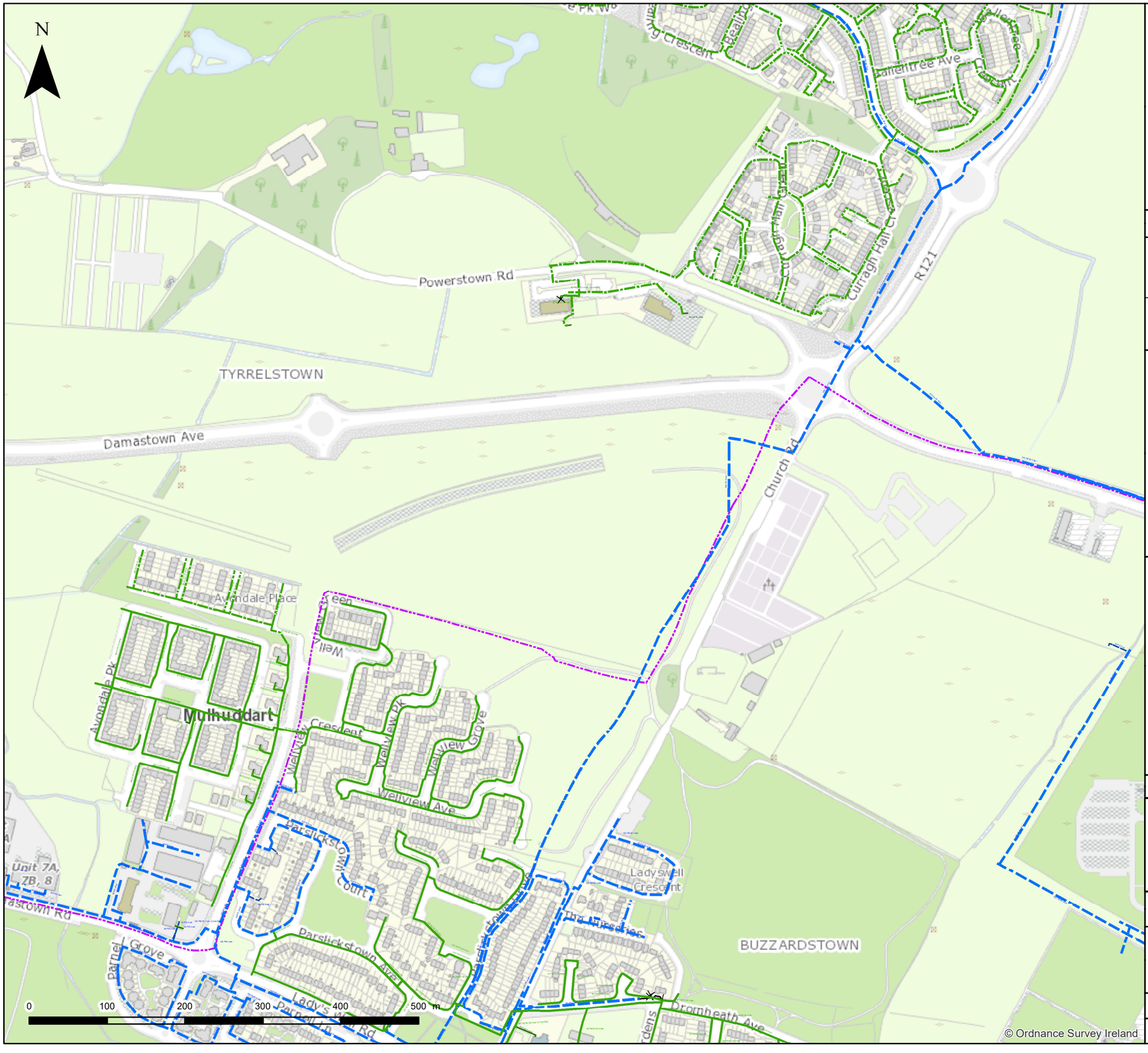
ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A0 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

PLEASE NOTE THAT THERE ARE: HIGH VOLTAGE (38KV AND HIGHER VOLTAGES) OVERHEAD LINES AND UNDERGROUND CABLES ON THIS MAP. IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT THE DESIGNATED PARTIES IN ADVANCE OF THE WORKS:

FOR HIGH VOLTAGE OVERHEAD LINES: (38KV AND HIGHER VOLTAGES)
CONTACT: ALAN BROWN, ESB TRANSMISSION, KYLEMORE WAY,
DUBLIN 8, D08-E398. PHONE: 087 9273970 EMAIL: ALAN.BROWN@ESB.IE

FOR HIGH VOLTAGE UNDERGROUND CABLES: (38KV AND HIGHER VOLTAGES)
CONTACT: GARETH PAISLEY, ESB TRANSMISSION, KYLEMORE WAY,
DUBLIN 8, D08-E398. PHONE: 087 9374867 EMAIL: GARETH.PAISLEY@ESB.IE

X,Y: 307774, 240933



Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1850 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (1890 289 389) or can be downloaded at www.hsa.ie.

Legal Notice: Gas Networks Ireland (GNI) and its affiliates, accept no responsibility for the accuracy of any information contained in this document including data concerning location and technical designation of the gas distribution and transmission network (the"Information"). The Information should not be relied on for accurate distance or depth of cover measurements.

Any representations and warranties, express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation,direct, indirect or consequential loss, arising out of or in connection with the use or re-use of the Information.

- Aurora Telecom Duct
- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926166 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1850 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1850-427747 for specific information

DIAL BEFORE YOU DIG 1850 42 77 47
In Emergency call 1850 20 50 50 Gas Networks Ireland

Gas Networks Ireland

GAS NETWORK INFORMATION

Description:

Location: 706907,741434

Plot Date: 17/08/2020 15:51	Scale: 5000 @ A3
Plotted By: 813	Ref ID: *813_17082020155135*

T50 Fibre Duct

T50 Fibre Duct

T50 Fibre Duct

Unit 7,
Westgate Business Park,
Ballymount,
Dublin 24.

PROJECT NAME

DESIGNED BY:

Produced on: 18/08/2020

@ A3

Brady Shipman Martin

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Ranelagh
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