

HOLLYSTOWN KILMARTIN SITE 4

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) VOLUME 3 : APPENDICES

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Environmental Assessment **Built Environment**

Client:

Marina Quarter Limited

Date:

30 August 2023

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Appendix 8.1 Bat Survey Report

An Evaluation of the Hollystown – Kilmartin Site 4 for Bat Roost Sites and for Feeding and Commuting

Potential Impacts of the Proposed Development



Brian Keeley B.Sc. (Hons) in Zool.
Wildlife Surveys Ireland
August 2023

Report for 2022 Brian Keeley

Report for 2023 Fionn Keeley B.Sc. M.Sc.

Introduction

Bats are a widespread element of the Irish fauna and make up one quarter of all terrestrial mammal species. They are known to occur from much of the rural landscape which predominates on the island of Ireland, but they are also present within the urban environment and here they occupy buildings and occasionally trees for short or long periods. Buildings are

a vital element of the annual cycle of all Irish bat species and at no time more so than the period summer to early autumn, but many bats may also avail of buildings as hibernation sites often when the presence of bats may be impossible to determine.

Trees are less commonly noted as roost sites, partly due to a younger tree population for the island than in the rest of Europe and partly due to under-reporting.

Habitat loss or modification is an issue for bats as well as many other species. Changes to a site such as tree-felling and hedgerow clearance and the introduction of new houses and entire estates may remove roost sites and reduce the lands available to bats as a feeding site or in some way prevent full utilisation of the area by bats by interfering with a bat's ability to commute through a site or roost within the site.

Bats are protected by Irish and EU law and to prevent unlawful injury or death, it is essential that a full understanding of the site is available in advance to protect the resident bats from unintentional disturbance and to create a pathway by which a legal derogation and exemption may be designed in consultation with the National Parks and Wildlife Service. This is a service of the Heritage Division of the Department of Housing, Local Government & Heritage, if impacts are likely to be severe.

Prior to significant changes to a site, it is necessary to ensure that there will be no impact upon protected species, such as all of Ireland's bats. Bats of less common species may be present within a site unbeknownst to owners and residents and there is a requirement to undertake a survey by suitably qualified ecologists with the appropriate equipment to determine which species are present. Should bats be present, knowledge of the species concerned and the potential consequences of the modifications of the site can assist in identifying measures to alleviate the negative effects of these changes. This is a legal requirement given the protection level for these species to ensure that the nine species' conservation status are not reduced by major changes to an area.

Surveys provide a very detailed picture of the use of a site by bats at the time of assessment and from the available habitat, the previous surveys in adjoining lands and the bat data from the area recorded over several years, it is possible to predict the impacts of change and provide mitigation (for most proposed changes). Feeding may, for example, be more concentrated in

some areas due to better shelter from wind or rain. Trees may be occupied for various purposes at the different phases in the bat's annual cycle. Bats breed in the period May to August and maternity roosts may be encountered in trees. Individuals or small numbers of bats may use a tree throughout the rest of the year. Male bats may use trees to perch and establish mating perches or roosts in the summer and autumn. Bats may hibernate in trees from late October to the end of March or April. The site has no buildings.

Trees may serve as feeding areas for bats and a substrate for their prey. Trees are essential for insect diversity, shelter for wind and rain and as landmarks. This assessment was undertaken in the breeding seasons for bats in 2022 and 2023.

Surveying for bats in late July is an ideal time to address the usage of a site during the breeding season. Maternity roosts are typically still intact and young bats have begun to fly by this time. This is also the time when the best feeding opportunities are available to the young and lactating females and is an ideal time to determine good feeding areas for bats.

Similarly, the 2023 survey was taken in early August and would represent a similar stage of the breeding season; at this time young bats would be flying and becoming more independent, which makes this a highly suitable time to assess population growth over the year.

Methodology

The initial survey of the lands was undertaken on 26th and 27th July 2022, by two bat surveyors with the aid of an Echometer Touch 2 Pro (EMT) smartphone attachment handheld "real time expansion" (a term used by the manufacturer to explain that the equipment records all signals across the ultrasonic range and then speeds up the signal to create a real-time equivalent of the sounds produced by any bats encountered) bat detector and an Anabat Walkabout ("Anabat"). The Anabat records all ultrasound to a SD card and includes the time and position for each recording.

A second survey took place on August 2nd and 3rd 2023, by two surveyors using the same equipment as was used on the 2022 survey. A SongMeter Mini Bat stationary monitor was also used on this survey.

The EMT and Anabat were held for the entire active survey, while the SongMeter was placed close to the midpoint of the east hedge overnight during the 2023 survey. An examination of available information from Bat Conservation Ireland, previous data from the site and survey results from other areas of Mulhuddart / Tyrrellstown etc was undertaken to compile a list of most likely species in addition to the evaluation of the habitat and known distributions of Irish species.

Survey constraints

The survey was undertaken in the Hollystown-Kilmartin Site 4 lands in the period of the year when activity is at its highest (June to August) over two consecutive summers. Weather conditions were ideal for both surveys. The survey temperature was 16 degrees Celsius at sunset on July 26th, 2022 (at 21.31 hours). Sunrise was at 05.33 hours on 27th July 2022. At this time, it was cloudy, calm and dry.

Sunset on the 2nd of August 2023 was at 21.19 hours, with sunrise the following day at 05.44 hours. The survey temperature was again at around 16 degrees at sunset, dropping to 11 degrees overnight. Conditions were dry with a light breeze.

Existing Environment

Bat fauna of Hollystown-Kilmartin Site 4

Roosting species None

There are no buildings within the site. There are a number of trees that offer low roost potential around the perimeter of the site. No bats were seen to emerge from or enter any tree around the site.

Bat species feeding or commuting within the site based on the active survey

Common pipistrelle *Pipistrellus pipistrellus*

Soprano pipistrelle *Pipistrellus pygmaeus*

Leisler's bat *Nyctalus leisleri*

In July 2022, the most widespread bat species was the common pipistrelle with records of this species throughout the site but very low activity within the open field. Common pipistrelles were present both after sunset and prior to sunrise and it is probable that there are roosts in neighbouring sites, but none were present within the site. Leisler's bat activity was highest along the southern perimeter of the site and was most active after sunset and was only occasionally heard prior to sunrise within the site. Soprano pipistrelle activity was higher in the northern area of the site and very low in the southern area with no bats noted within the centre of the field.

Table 1: Summary of signals recorded by one surveyor throughout the survey period on the southern section of the site, July 2022

Bat species	Number of passes per hour				Grand Total
	21:00	22:00	04:00	05:00	
Leisler's bat	9	54		1	64
Common pipistrelle	1	40	10		51
Soprano pipistrelle		4			4
Grand Total	10	98	10	1	119

Table 2: Summary of signals from the northern section of the site, July 2022

Bat species	Number of passes per hour				Grand Total
	21:00	22:00	04:00	05:00	
Leisler's bat	1	12	1		14
Common pipistrelle		3	2		5
Soprano pipistrelle		18	5		23
Grand Total	1	33	8	0	42

The Leisler's bat total was due to the repeat activity of this species along the southern boundary with the cricket club. Bats flew below tree top height on occasion as well as flying high up over the site. Common pipistrelles were much more notable in the southern section of the field and were primarily noted along the hedgerow to the rear of the Cricket Club.

Both common pipistrelles and Leisler's bats were present prior to sunrise at the southern section of the site but none entered any tree within the site. There are opportunities in nearby houses for roosting bats. There are a variety of new and more established houses in this area that are suitable for the more common species such as common pipistrelle and Leisler's bats. Older houses and farmyards are located along the Powerstown Road to the southwest of the site and to the north along Kilmartin Lane.

Table 3: Summary of signals from the eastern and southern sections of the site, August 2023

Bat species	Number of passes per hour					Grand Total
	21:00	22:00	23:00	04:00	05:00	
Leisler's bat		2	1	1	1	5
Common pipistrelle		2				2
Soprano pipistrelle	1	7	1		1	10
Grand Total	1	11	2	1	2	17

Table 4: Summary of signals from the northern section of the site, August 2023

Bat species	Number of passes per hour				Grand Total
	21:00	22:00	04:00	05:00	
Leisler's bat	3	4		9	16
Common pipistrelle		9			9
Soprano pipistrelle	1	2	7		10
Grand Total	4	15	7	9	35

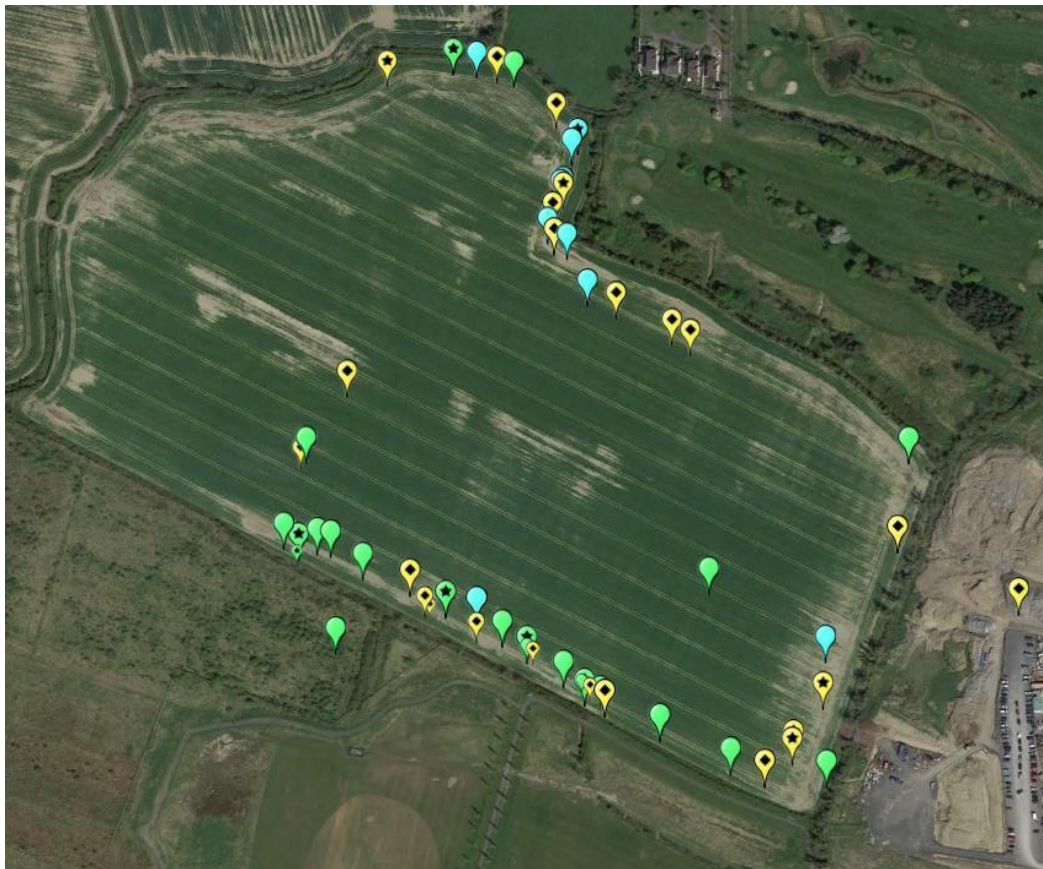
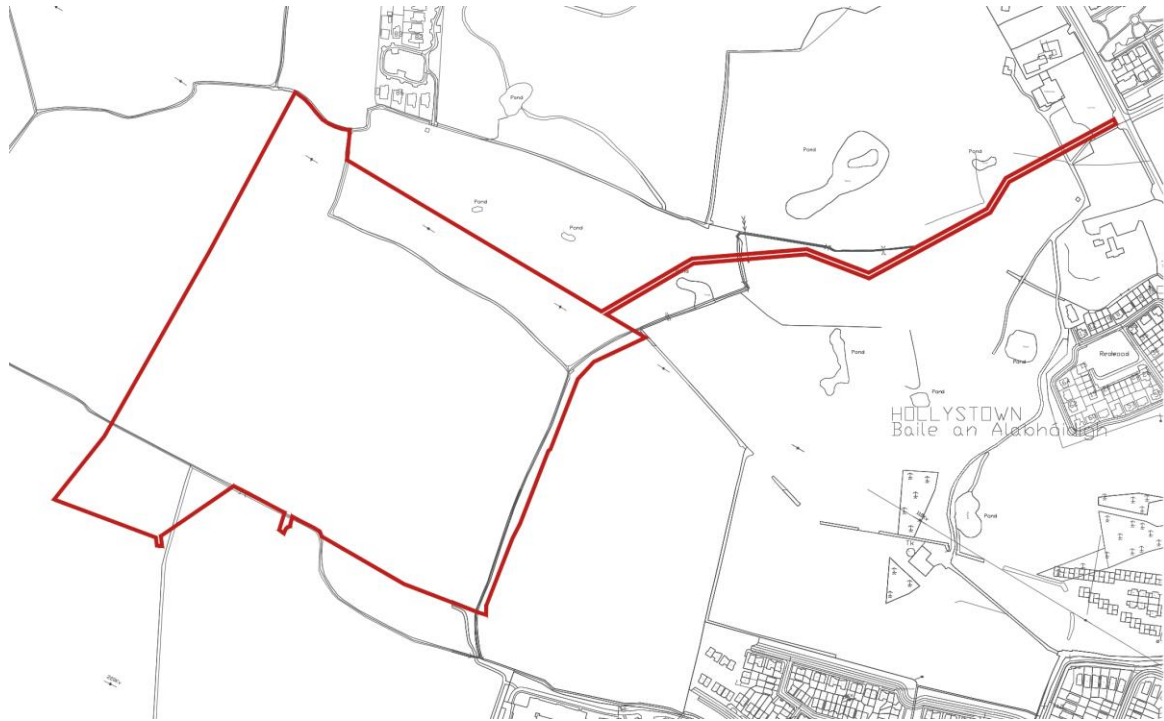
Table 5: Summary of signals from a static monitor placed midway along the eastern hedge, August 2023

Bat species	Number of passes per hour								Grand Total
	22:00	23:00	00:00	01:00	02:00	03:00	04:00	05:00	
Leisler's bat	1	2	1	1	0	0	4	1	10
Common pipistrelle	2	61	34	4	1	2	3	0	107
Soprano pipistrelle	0	3	4	1	1	1	0	0	10
Grand Total	3	66	39	6	2	3	7	1	127

Similarly, the common pipistrelle was the most widely recorded species during the August 2023 survey, although soprano pipistrelles and Leisler's bats were also recorded several times.

Leisler's bats appeared to be more active towards the north of the site on this occasion (which may be related to the increased tree cover to this side) while the southern part of the site had a more even balance of species. Immediately prior to dawn, much more activity was observed in the northern portion of the site (especially along the hedge) compared to the southern portion, which may also be an effect of the increased tree cover to the north.

The number of common pipistrelle passes recorded by the static monitor, placed midway along the eastern field boundary, indicates that this hedge is an important feeding and commuting route for this species – as with the large number of Leisler's bat passes recorded during the 2022 survey, this mostly represents repeated passes by the same bats flying back and forth along the length of the hedge while feeding. As no common pipistrelles were recorded immediately before sunrise, these bats were likely to be roosting further from the survey area and had already left the site by that time (with the last common pipistrelle record on the static monitor being at 04:05 hours). Very little bat activity was recorded in the middle of the field at any point over the night.



Proposed site and Bat Activity 26th to 27th July 2022

Legend

Blue paddle

Yellow paddle

Green paddle

Soprano pipistrelle with star = prior to sunrise

Leisler's bat with star = prior to sunrise

Common pipistrelle with star = prior to sunrise



Bat Activity 3rd to 4th August 2023

Legend

Blue paddle

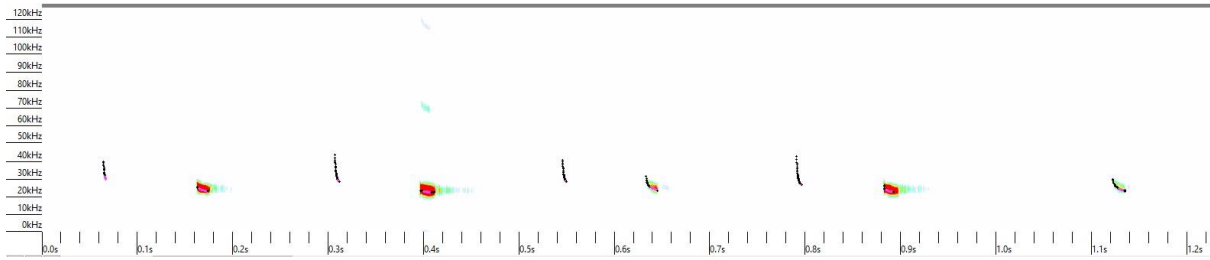
Purple paddle

Green paddle

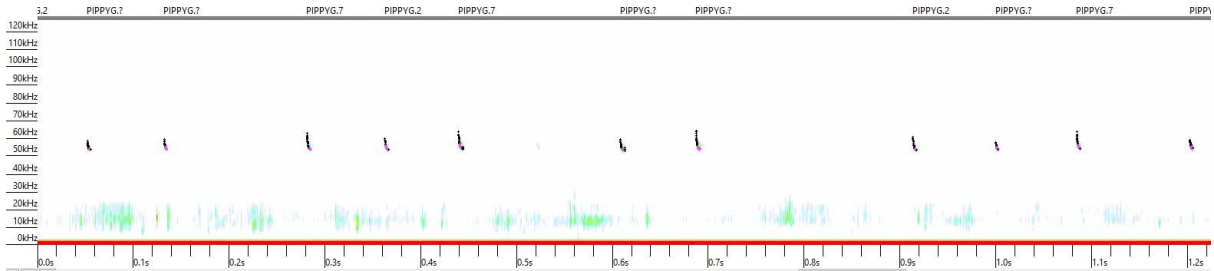
Soprano pipistrelle with star = prior to sunrise

Leisler's bat with star = prior to sunrise

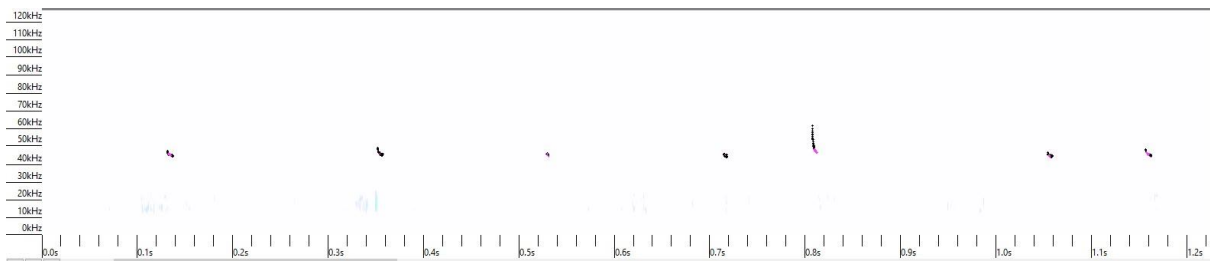
Common pipistrelle with star = prior to sunrise



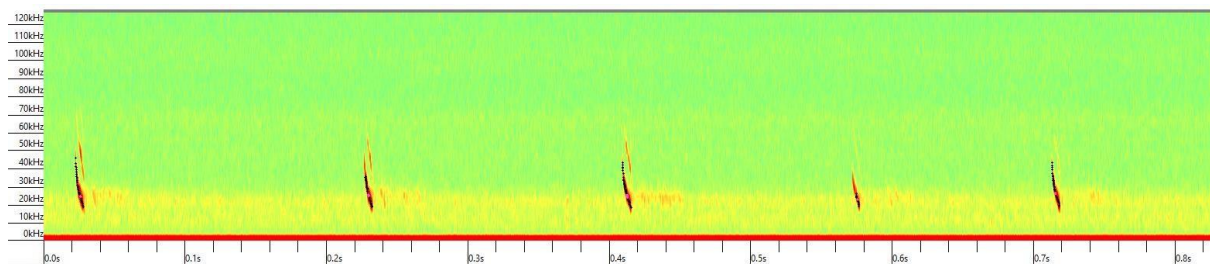
Leisler's bat 26th July 2022



Soprano pipistrelle 26th July 2022



Common pipistrelle 26th July 2022



A brown long-eared bat was noted to the east in the neighbouring lands on 16th August 2021 (*An Evaluation of the Former Hollystown Golf Course Sites 2 and 3 Kilmartin, Tyrrellstown For Potential as Bat Roost Sites and For Feeding and Commuting and Potential Impacts Of the Proposed Development, Brian Keeley B.Sc. (Hons) in Zool. November 2021*). No brown long-eared bat activity was recorded in 2022 or 2023 in this assessment.

Other observations

Two young long-eared owls were also recorded in the area during the 2023 survey. These were first observed in the site's north-eastern corner just after sunset, flying south along the site's eastern hedgerow while calling to each other, and eventually moving from the site's south-eastern corner over to the trees bordering the nearby housing estate. These two would have been hatched earlier this year and raised over the summer, indicating that long-eared owls are nesting close to the site – possibly in or near the trees close to the field's north-eastern corner. A grasshopper warbler was heard within the fields to the southwest of the site in July 2022. This species was not noted in August 2023 but was not sought in a targeted survey.



Photographs showing trees along the northern, eastern and southern hedgerows.

While several of these trees are mature enough to have roost potential, all were covered with climbing plants such as ivy which would greatly reduce their potential.

Proposed Development



The proposed development relates to a site of c.20.6ha referred to as Hollystown-Kilmartin 4 located in the townland of Hollystown and Kilmartin, Dublin 15. The site is bound by lands which previously formed part of the former Hollystown Golf Club and the residential area of Hollystown Park to the north, lands forming part of a permitted Strategic Housing Development (SHD) to the east (ABP Reg. Ref. 312271), Tyrrelstown Park to the south, and rural zoned lands to the west.

The proposed development will include for the development of 580 no. residential units, consisting of 112 no. apartments/duplexes and 468 no. houses ranging from 1 – 3 storeys and will also include for car parking, cycle parking, new pedestrian/ cycle links, storage, services and plant areas. Landscaping will include for high quality private open space, communal amenity areas and public open space provision.

Potential Impacts

Loss of roosts

While no tree roosts were noted during this assessment, there is potential that bats may avail of the existing trees for short-term periods (e.g. individual bats may roost overnight). Tree roosts are much more difficult to pinpoint than building roosts due to their frequently short-term use. This is potentially a long-term moderate negative impact without the implementation of mitigation. There are few high-quality trees within the boundary of the site and there is no roost loss identified from this assessment.

Loss of habitat

There will be a limited loss of scrub but a loss of several mature trees and hedgerow (varying between poor and moderate quality) which provide shelter for insects and areas for bats to feed. This will reduce insect abundance and feeding and commuting corridors. This is a long-term to permanent moderate negative impact without the implementation of mitigation.

Disturbance from lighting

At present, the site is an unlit field with no light overspill entering from housing albeit that the neighbouring fields are under construction and will be a site for housing within months. Lighting will be introduced for two different functions: 1) Access and safety 2) Security and policing. The former is to allow ease of use at night while the latter ensures a perceived higher security level.

Lighting may affect bat species, in particular, light-intolerant bat species during foraging and if directed at emergence points would affect all bat species, even those that will feed in illuminated areas. This is a long-term moderate negative impact without the implementation of mitigation.



Lighting in new housing south-east of the site (zoomed up to the right)

Mitigation

Checking of mature trees for the presence of bats

A bat specialist shall examine the trees for bat roost potential and for the presence of bats before felling commences. The trees shall be assessed by a bat specialist from a height access if due for felling in winter or by a bat detector assessment (or a combination of both) if felling occurs at any other time. Should roosting bats be discovered a derogation licence would be required from NPWS prior to any tree felling being undertaken.

If a bat survey has been undertaken by a bat specialist and bats have been determined to be absent, felling may proceed under the supervision of a bat specialist. If there is any doubt regarding the presence of bats, height access shall be provided to allow the examination of any trees with roost potential prior to felling.

Provision of bat roosts

Bat boxes

6 x 2F Schwegler bat boxes shall be erected within unlit areas away from traffic and likely disturbance within the site. These must be no less than 3 metres above ground in uncluttered areas facing in a southerly direction. Boxes may be attached to buildings, trees, or poles. Alternatively, inbuilt bat boxes may be used in 6 houses. The following are options: Integrated Eco Bat Box and Vivara Pro Build-in WoodStone Bat Box. The locations of bat boxes shall be agreed with a bat specialist.

Trees

The following trees are proposed for the provision of future roosting opportunities: *Quercus robur* and *Q. palustris*, *Pinus sylvestris* and *Metasequoia glyptostroboides* are proposed as part of the planting regime. Other trees that would serve for cover and insect diversity within the proposal are *Arbutus marina*, *Prunus serrulata* 'Tai Haku' and *Betula pendula*.

The hedges will be enhanced (or entirely replaced in the case of the eastern boundary) with *Crataegus monogyna* and *Prunus spinosa* plus a range of other native hedge planting (such as *Euonymus europaeus*, *Sorbus aucuparia*, *Corylus avellana* etc)

Lighting

Lighting must be designed that will limit overspill from the required area for illumination and prevent light pollution. This should aim to avoid mature trees in particular. LED is the most energy efficient source available and wherever a permanent source of night lighting is unessential, it should be motion-activated.

- 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) shall be adopted to reduce blue light component
- Luminaires shall feature peak wavelengths higher than 550 nm
- Tree crowns in the adjacent lands shall remain unilluminated
- Planting shall provide areas of darkness suitable for bats to feed and commute through the site
- Remaining or planted trees must not be illuminated as this would prevent their use for feeding by bats

Existing Lighting Plan

From DD208 Hollystown Site Lighting Report (IN2 Engineering Design Partnership, 2023):

The external lighting for this development has been designed to achieve the performance requirements as set out in the following standards:

- *BS 8300:2018 Design of an accessible and inclusive built environment*
- *Fingal County Council Public Lighting Guidelines 2017*
- *Institution of Lighting Professionals – Guidance Notes for the Reduction of Obtrusive Light GN01:2011*
- *BS EN 13201-2:2015 – Road Lighting Part 2: Performance Requirements*
- *BS 5489-1:2013 Code of Practice for the Design of Road Lighting*
- *Chartered Institution of Building Services Engineers – Lighting Guide 6: The Exterior Environment*
- *NSAI: The New National Rules for Electrical Installations I.S. 10101:2020*
- *Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, 2010).*
- *Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2018).*

The proposed lighting will have a temperature of 3000 K, will have a warm white spectrum will be directed by the luminaire towards the required areas of most requirement for lighting (e.g. roads). It is important that the luminaires assist in preventing light spillage on to tree canopies and on to areas through which bats may navigate. These areas must be provided with sufficient protection from light to prevent disruption to foraging or commuting.

Impacts of the Development following Mitigation

This will result in a long-term to permanent slight negative impact upon bat species with proper implementation of the proposed measures, as the proposed developments will affect bat foraging and commuting. The measures proposed meet the requirements proposed in the Commission notice Guidance document on the strict protection of animal species of Community interest under the Habitats Directive, (Brussels, 12.10.2021 C(2021) 7301 final).

APPENDICES

BCIreland data: search results 08 August 2023			
Search parameters: Roosts Transects Ad -hoc observation sites with observations of all bat species within 1 km of O0693743298			
Roosts			
Name	Grid reference	Species observed	
St Peters Yellow walls	O0743	Pipistrellus spp. (45kHz/55kHz)	
Transects			
Name	Grid reference start	Species observed	
Ad-hoc observations			
Survey	Grid reference	Date	Species observed

BCIreland data: search results 8 Aug 2023			
Search parameters: Roosts Transects Ad-hoc observation sites with observations of all species within 10000m of O0693743298			
Roosts			
Name	Grid reference	Species observed	
33 Inchicore Rd	O1234	Unidentified bat	
36 Oaklawn Wood	O0036	Nyctalus leisleri	
Abbotstown House	O0939	Nyctalus leisleri	
Airlie Stud Stable Block, Adamstown, Co. Dublin	O0233	Unidentified bat	
Anna Liffey House	O0436	Pipistrellus spp. (45kHz/55kHz),Plecotus auritus	
Avalon	O0041	Pipistrellus pygmaeus,Myotis mystacinus	
Bailiff's/Superintendent's Lodge	O1035	Pipistrellus pygmaeus	
Beech Tree Roost St Catherines Park	O0135	Myotis daubentonii	
Bennetstown Bridge	O0143	Myotis nattereri	
Blanchardstown Hospital	O0839	Pipistrellus spp. (45kHz/55kHz),Pipistrellus pygmaeus	
Castleknock College	O0836	Plecotus auritus,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis spp.	
Cedarwood Cottage	O1346	Nyctalus leisleri	
Church at St. Mary's Hospital	O1034	Plecotus auritus	

Crodaun, cottage	N9735	Pipistrellus pipistrellus (45kHz)	
Deerfield House, Phoenix Park	O1135	Plecotus auritus	
Dunboyne Bridge	O0142	Myotis nattereri	
Esker House	O0334	Pipistrellus spp. (45kHz/55kHz),Plecotus auritus	
Farmleigh House	O0936	Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii	
Farmyard Suralstown	O1247	Pipistrellus pipistrellus (45kHz)	
Fieldstown House	O1150	Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz)	
Hunter Residence	O0441	Pipistrellus pygmaeus,Unidentified bat	
Kingsfurze	O0835	Unidentified bat	
Knockmary Hill Lodge	O1034	Pipistrellus spp. (45kHz/55kHz)	
Large Clock Tower	O0936	Pipistrellus pipistrellus (45kHz)	
Laundry Gate Lodge	O1235	Pipistrellus pygmaeus	
Lime Tree Roost, St Catherines Park	O0136	Pipistrellus pipistrellus (45kHz)	
Lorrha Lodge	O0042	Nyctalus leisleri	
Lucan Spa Hotel Roost	O0235	Pipistrellus spp. (45kHz/55kHz)	
Luttrellstown Castle cave	O0536	Myotis daubentonii	
Luttrellstown Castle folly	O0536	Plecotus auritus,Myotis nattereri	
Mc Kee Barracks	O1335	Myotis mystacinus	
Mock church tower	O1136	Nyctalus leisleri	
Mountjoy House	O1036	Plecotus auritus	
Mountjoy House building	O1036	Plecotus auritus	
Oak tree with damaged branch	N9733	Nyctalus leisleri	
Old Industrial Site	O1434	Pipistrellus pipistrellus (45kHz)	
Old shower block	O1234	Pipistrellus spp. (45kHz/55kHz)	
OPW Storage Areas	O1235	Plecotus auritus	
Owner unknown	o0438	Pipistrellus pipistrellus (45kHz)	
Powerstown Road - Tree	O0542	Pipistrellus pipistrellus (45kHz)	
Robertstown House	O0851	Plecotus auritus	
Santry, Tree Roost	O1640	Unidentified bat	
Shed at Deerkeeper's Lodge	O1134	Plecotus auritus	
Skidoo House	O1550	Pipistrellus pygmaeus	
Skidoo House stable	O1550	Pipistrellus pygmaeus	
Small clock tower	O0936	Nyctalus leisleri	
St Brigids Castleknock	O0837	Plecotus auritus	
St Marys	O1533	Nyctalus leisleri	
St Marys	O1335	Nyctalus leisleri	
St Peters Yellow walls	O0743	Pipistrellus spp. (45kHz/55kHz)	
St Pius	O1533	Unidentified bat	
Stirling Road Bridge	O0142	Myotis nattereri	

Tandys Lane Farmhouse, Adamstown, Co. Dublin	O0233	Unidentified bat, Plecotus auritus	
Tierney Residence	O0541	Unidentified bat	
US Ambassador's residence and outbuildings	O1035	Plecotus auritus	
Viking Components Europe	O1533	Unidentified bat	
Warrenstown House, Blanchardstown Road North, Blanchardstown, Dublin 15	O0740	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	
Transects			
Name	Grid reference start	Species observed	
Abbotstown Bridge Transect	O0938	Myotis daubentonii, Unidentified bat	
Ashbourne Town Transect	O0652	Unidentified bat	
Ashtown Station Transect	O1137	Myotis daubentonii, Unidentified bat	
Bridge North of Killeek Transect spot 1	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 10	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 2	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 3	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 4	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 5	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 6	O1446	Myotis daubentonii, Unidentified bat	
Bridge North of Killeek Transect spot 7	O1446	Myotis daubentonii, Unidentified bat	
Bridge North of Killeek Transect spot 8	O1446	Myotis daubentonii	
Bridge North of Killeek Transect spot 9	O1446	Myotis daubentonii	
Cardiff Bridge Transect	O1237	Myotis daubentonii, Unidentified bat	
Castleknock Transect, Spot 10	O0838	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Myotis spp.	
Castleknock Transect, Spot 2	O0737		
Castleknock Transect, Spot 3	O0737	Unidentified bat, Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Myotis spp.	
Castleknock Transect, Spot 4	O0737	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Myotis spp.	
Castleknock Transect, Spot 5	O0737	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii, Pipistrellus spp. (45kHz/55kHz), Myotis spp., Nyctalus leisleri	
Castleknock Transect, Spot 6	O0737	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz)	
Castleknock Transect, Spot 7	O0737	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz)	
Castleknock Transect, Spot 8	O0837	Unidentified bat, Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz)	
Castleknock Transect, Spot 9	O0837	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz)	
Castletown Estate Transect	N9934	Unidentified bat, Myotis daubentonii, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	
Celbridge Gateway Site	N9735	Myotis nattereri, Pipistrellus pipistrellus (45kHz), Nyctalus leisleri	
Collins Bridge Transect	O0236	Myotis daubentonii, Unidentified bat, Nyctalus leisleri	
Cope Bridge Leixlip Transect	O0037	Unidentified bat, Myotis daubentonii	
Deey Bridge Transect	N9737	Myotis daubentonii, Unidentified bat	
Dunboyne Loughsallagh Bridge Transect	O0241	Unidentified bat	

Fieldstown R122 Rolestown Transect	O1150	Myotis daubentonii, Unidentified bat	
Grandard Bridge Transect	O0938	Myotis daubentonii, Unidentified bat	
Griffth Park to Drumcondra Park Transect	O1636	Pipistrellus spp. (45kHz/55kHz), Myotis daubentonii, Unidentified bat	
Leixlip Bridge Transect	O0035	Myotis daubentonii, Unidentified bat	
Milltown Bridge on Broadmeadow Transect	O0751	Myotis daubentonii, Pipistrellus nathusii	
O04 (15) 2004-	O0351	Pipistrellus spp. (45kHz/55kHz), Pipistrellus pipistrellus (45kHz), Nyctalus leisleri, Plecotus auritus, Pipistrellus pygmaeus	
O04 (16) 2004-2008	O0646	Nyctalus leisleri, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz)	
O04 (17) 2004-2008	O0946	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Pipistrellus pygmaeus	
O04 (18) 2004-2008	O0952	Pipistrellus pipistrellus (45kHz), Pipistrellus nathusii, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	
O04 (19) 2004-2008	O1650	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz)	
Phibsboro	O1536	Unidentified bat	
Rye Bridge Transect	O0035	Myotis daubentonii, Unidentified bat	
Swords Golf Club Transect	O1450	Myotis daubentonii, Nyctalus leisleri, Pipistrellus pygmaeus, Unidentified bat	
Violet Hill Drive Transect	O1337	Nyctalus leisleri, Pipistrellus spp. (45kHz/55kHz), Unidentified bat, Myotis daubentonii	
Violet Hill Drive Transect, Spot 1	O1437		
Violet Hill Drive Transect, Spot 10	O1337	Unidentified bat	
Violet Hill Drive Transect, Spot 2	O1435		
Violet Hill Drive Transect, Spot 3	O1437		
Violet Hill Drive Transect, Spot 4	O1437	Pipistrellus pipistrellus (45kHz)	
Violet Hill Drive Transect, Spot 5	O1437	Myotis daubentonii	
Violet Hill Drive Transect, Spot 6	O1437	Myotis daubentonii	
Violet Hill Drive Transect, Spot 7	O1437	Pipistrellus pipistrellus (45kHz), Unidentified bat, Myotis daubentonii	
Violet Hill Drive Transect, Spot 8	O1437	Unidentified bat	
Violet Hill Drive Transect, Spot 9	O1337	Pipistrellus pipistrellus (45kHz)	
War Memorial Garden Transect	O1134	Myotis daubentonii, Unidentified bat	
Waterstown Park	O0835	Unidentified bat, Myotis daubentonii	
Ad-hoc observations			
Survey	Grid reference	Date	Species observed
Ad Hoc Records collected during Monitoring	O0942	30/09/2021	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri
Bat Eco Services	O0133	02/06/2020	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Nyctalus leisleri
Bat Eco Services	O0938	02/05/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus

Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0538	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O1037	29/07/2021	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii,Pipistrellus pygmaeus
Bat Eco Services	O0538	02/05/2022	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Myotis daubentonii
Bat Eco Services	O0538	02/05/2022	Myotis daubentonii
Bat Eco Services	O0338	03/05/2022	Myotis daubentonii
Bat Eco Services	O0337	03/05/2022	Myotis daubentonii
Bat Eco Services	O0637	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Nyctalus leisleri
Bat Eco Services	O0937	28/07/2021	Nyctalus leisleri
Bat Eco Services	O0938	28/07/2021	Nyctalus leisleri
Bat Eco Services	O0937	28/07/2021	Nyctalus leisleri
Bat Eco Services	O0737	02/05/2022	Nyctalus leisleri
Bat Eco Services	O0538	02/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0136	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0136	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0236	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0236	03/05/2022	Nyctalus leisleri

Bat Eco Services	O0236	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0236	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0438	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0337	03/05/2022	Nyctalus leisleri
Bat Eco Services	O0838	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0937	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0938	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0937	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O0937	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)
Bat Eco Services	O1037	02/09/2021	Pipistrellus pipistrellus (45kHz)

Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	02/09/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	29/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	29/07/2021	
Bat Eco Services	O0937	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0938	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0937	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0937	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0937	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0937	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O1037	28/07/2021	Pipistrellus pygmaeus
Bat Eco Services	O0838	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0938	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Bat Eco Services	O0737	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0537	02/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0438	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0438	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0338	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0338	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0236	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0236	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0236	03/05/2022	Pipistrellus pygmaeus

Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0338	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0438	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0438	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0337	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0236	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0236	03/05/2022	Pipistrellus pygmaeus
Bat Eco Services	O0136	02/05/2022	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Plecotus auritus,Myotis daubentonii
Bat Eco Services	O0637	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii
Bat Eco Services	O0236	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii
Bat Eco Services	O0538	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
Bat Eco Services	O0838	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
Bat Eco Services	O0737	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Pipistrellus nathusii
Bat Eco Services	O0737	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii,Pipistrellus nathusii
Bat Eco Services	O0337	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii,Pipistrellus nathusii
Bat Eco Services	O0537	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii,Pipistrellus nathusii
Bat Eco Services	O0337	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii,Pipistrellus nathusii
Bat Eco Services	O0438	02/05/2022	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii,Pipistrellus nathusii
Bat Survey - Scott Cawley	O1135	2007-06-00	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus nathusii,Plecotus auritus,Nyctalus leisleri,Myotis natterteri,Myotis daubentonii,Myotis mystacinus,Myotis mystacinus/brandtii
Bat Survey - Scott Cawley	O1135	2008-00-00	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus nathusii,Plecotus auritus,Nyctalus leisleri,Myotis natterteri,Myotis daubentonii,Myotis spp.,Myotis mystacinus/brandtii
Bat Survey - Scott Cawley	O1534	25/07/2005	Nyctalus leisleri
Bat Survey - Scott Cawley	O1039	02/08/2005	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O1433	2006-07-00	Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	O0538	26/07/2006	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	O1339	05/09/2006	Pipistrellus pygmaeus
Bat Survey - Scott Cawley	N9733	11/07/2007	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii,Myotis natterteri
Bat Survey - Scott Cawley	N9733	11/09/2007	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Myotis spp.
Bat Survey - Scott Cawley	N9733	16/07/2008	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Plecotus auritus,Myotis natterteri,Myotis daubentonii,Nyctalus leisleri
Bat Survey - Scott Cawley	O0939	31/07/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O1237	11/06/2009	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)

Bat Survey - Scott Cawley	O1235	13/08/2007	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis mystacinus,Myotis daubentonii,Plecotus auritus,Myotis spp.,Pipistrellus nathusii
Bat Survey - Scott Cawley	O1136	21/05/2007	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	O1136	21/05/2007	Nyctalus leisleri
Bat Survey - Scott Cawley	O1134	08/05/2007	Nyctalus leisleri,Pipistrellus spp. (45kHz/55kHz)
Bat Survey - Scott Cawley	O0935	18/07/2007	Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O0836	20/07/2007	Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O0936	05/08/2007	Nyctalus leisleri,Pipistrellus spp. (45kHz/55kHz),Myotis spp.
Bat Survey - Scott Cawley	O1036	10/08/2007	Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O1135	2008-06-00	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus nathusii,Plecotus auritus,Nyctalus leisleri,Myotis natterleri,Myotis daubentonii,Myotis mystacinus/brandtii,Myotis spp.
Bat Survey - Scott Cawley	O1440	07/09/2010	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Pipistrellus spp. (45kHz/55kHz)
Bat Survey - Scott Cawley	O1634	15/09/2010	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Pipistrellus nathusii
Bat Survey - Scott Cawley	N9936	13/10/2010	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis spp.,Pipistrellus spp. (45kHz/55kHz),Myotis daubentonii
Bat Survey - Scott Cawley	O0334	28/04/2011	Pipistrellus spp. (45kHz/55kHz),Unidentified bat,Myotis daubentonii,Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	O1648	13/09/2011	Nyctalus leisleri,Myotis spp.,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Bat Survey - Scott Cawley	O1440	30/08/2011	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Unidentified bat,Pipistrellus spp. (45kHz/55kHz)
Bat Survey - Scott Cawley	O1237	16/07/2012	Myotis daubentonii,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri
Bat Survey - Scott Cawley	O0241	01/05/2014	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis mystacinus/brandtii
Bat Survey - Scott Cawley	o1540	30/08/2016	Nyctalus leisleri
Bat Survey - Scott Cawley	o1540	31/08/2016	Nyctalus leisleri
Bat Survey - Scott Cawley	o1540	06/09/2016	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	o1539	30/08/2016	Nyctalus leisleri
Bat Survey - Scott Cawley	o1540	06/09/2016	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	o1539	06/09/2016	Unidentified bat,Pipistrellus pipistrellus (45kHz)
Bat Survey - Scott Cawley	o1440	31/08/2016	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Pipistrellus pygmaeus
Bat Surveys - Tina Aughney	O1546	31/08/2006	Myotis natterleri,Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bat Surveys - Tina Aughney	O0239	02/05/2007	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Myotis natterleri,Plecotus auritus
Bat Surveys - Tina Aughney	O0240	02/05/2007	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Myotis natterleri,Plecotus auritus
Bat Surveys - Tina Aughney	O0438	02/05/2007	Myotis daubentonii,Nyctalus leisleri,Pipistrellus pygmaeus
Bat Surveys - Tina Aughney	O0338	02/05/2007	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Myotis spp.
Bat Surveys - Tina Aughney	O0339	02/05/2007	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Plecotus auritus,Myotis spp.
Bat Surveys - Tina Aughney	O0241	02/05/2007	Nyctalus leisleri,Myotis natterleri,Myotis spp.,Pipistrellus pygmaeus
Bat Surveys - Tina Aughney	O0242	02/05/2007	Pipistrellus pygmaeus,Myotis natterleri
Bat Surveys - Tina Aughney	O0143	02/05/2007	Myotis natterleri,Myotis spp.

Bat Surveys - Tina Aughney	O1546	30/08/2006	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis nattereri
Bat Surveys - Tina Aughney	O0335	14/05/2002	Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii,Plecotus auritus
Bat Surveys - Tina Aughney	N9734	18/05/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Plecotus auritus
Bat Surveys - Tina Aughney	N9838	04/05/2017	Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Myotis spp.
Bat Surveys - Tina Aughney	N9838	04/05/2017	Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Myotis spp.
Bat Surveys - Tina Aughney	O1435	23/06/2018	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
BATLAS 2010	O0335	16/05/2008	Pipistrellus pygmaeus,Myotis daubentonii
BATLAS 2010	N9734	16/05/2008	Unidentified bat,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Plecotus auritus
BATLAS 2010	O1540	01/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2010	O1640	01/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2010	O1538	01/08/2008	Pipistrellus pipistrellus (45kHz)
BATLAS 2010	O1542	31/07/2008	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
BATLAS 2010	O1442	16/07/2008	Nyctalus leisleri
BATLAS 2010	O1542	16/07/2008	Nyctalus leisleri
BATLAS 2010	O1543	16/07/2008	Nyctalus leisleri
BATLAS 2010	O1642	16/07/2008	Nyctalus leisleri
BATLAS 2010	O1643	16/07/2008	Nyctalus leisleri
BATLAS 2010	O1533	16/06/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2010	O1633	16/06/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2010	O0635	30/06/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis spp.,Myotis daubentonii
BATLAS 2010	O0636	25/09/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2010	O0638	17/09/2008	Pipistrellus pygmaeus
BATLAS 2010	O0438	15/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2010	O0537	15/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2010	O0637	15/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2010	O1136	30/09/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus nathusii,Myotis nattereri,Myotis mystacinus/brandtii,Myotis daubentonii
BATLAS 2010	O1136	30/09/2008	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
BATLAS 2010	O0936	30/09/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri,Myotis daubentonii
BATLAS 2010	O1136	30/09/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2010	O0136	30/09/2008	Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2010	O0136	30/09/2008	Pipistrellus pygmaeus
BATLAS 2010	O1136	30/09/2008	Pipistrellus nathusii,Plecotus auritus,Myotis nattereri,Myotis mystacinus/brandtii,Myotis daubentonii
BATLAS 2010	O1134	30/09/2008	Pipistrellus spp. (45kHz/55kHz)
BATLAS 2010	O1036	30/09/2008	Pipistrellus spp. (45kHz/55kHz)

BATLAS 2010	O1235	30/09/2008	Pipistrellus spp. (45kHz/55kHz),Myotis daubentonii
BATLAS 2010	O1036	30/09/2008	Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri
BATLAS 2010	O1134	30/09/2008	Pipistrellus spp. (45kHz/55kHz),Plecotus auritus,Nyctalus leisleri
BATLAS 2010	O1034	30/09/2008	Plecotus auritus
BATLAS 2010	O1135	30/09/2008	Plecotus auritus
BATLAS 2010	O1136	30/09/2008	Nyctalus leisleri
BATLAS 2010	O0935	30/09/2008	Myotis nattereri
BATLAS 2010	O1035	30/09/2008	Myotis nattereri
BATLAS 2010	O0751	15/08/2008	Nyctalus leisleri,Myotis spp.
BATLAS 2020	N9742	15/07/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis mystacinus
BATLAS 2020	N9742	15/07/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis mystacinus
BATLAS 2020	N9844	15/07/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	N9844	15/07/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	N9847	16/07/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	N9952	16/09/2018	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	O0334	02/09/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	O1034	08/10/2015	Pipistrellus nathusii
BATLAS 2020	O0335	06/08/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	O0635	06/08/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii
BATLAS 2020	O1036	08/10/2015	Pipistrellus nathusii
BATLAS 2020	O1036	08/10/2015	Pipistrellus pipistrellus (45kHz)
BATLAS 2020	O1036	08/10/2015	Pipistrellus pipistrellus (45kHz)
BATLAS 2020	O0338	06/08/2016	Nyctalus leisleri
BATLAS 2020	O0640	22/08/2018	
BATLAS 2020	O1142	14/09/2017	Pipistrellus spp. (45kHz/55kHz)
BATLAS 2020	O0144	22/08/2018	Pipistrellus pygmaeus
BATLAS 2020	O0345	22/08/2018	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
BATLAS 2020	O0545	22/08/2018	Pipistrellus pipistrellus (45kHz)
BATLAS 2020	O1050	15/09/2016	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii,Myotis nattereri
BATLAS 2020	O0851	18/08/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
BATLAS 2020	O0351	18/08/2017	Pipistrellus spp. (45kHz/55kHz)
BATLAS 2020	O0351	18/08/2017	
BATLAS 2020	O0351	18/08/2017	
BATLAS 2020	O0351	18/08/2017	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis nattereri,Myotis spp.

BATLAS 2020	O0751	18/08/2017	
Bats in Dublin's City Centre Parks and Waterways	O1633	05/07/2000	Myotis mystacinus/brandtii
Bats in Dublin's City Centre Parks and Waterways	O1535	22/05/2000	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Bats in Dublin's City Centre Parks and Waterways	O1633	10/05/2000	Pipistrellus pygmaeus
Chris Peppiatt	O0334	30/05/2019	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus
Dublin Bat Group surveys	O1137	08/09/1999	Myotis daubentonii,Pipistrellus pygmaeus
Dublin Bat Group surveys	O1633	10/05/2000	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
Dublin Bat Group surveys	O1137	08/09/1999	Nyctalus leisleri
Dublin Bat Group surveys	O1633	05/07/2000	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Dublin Bat Group surveys	N9836	04/02/2001	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Dublin Bat Group Telephone and Follow-up Surveys	O0937	07/04/2002	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O1037	07/04/2002	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O1334	12/07/2006	Pipistrellus pipistrellus (45kHz)
EIS and Road Surveys - Conor Kelleher	O0735	22/06/2005	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O0938	22/06/2005	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O0735	22/06/2005	Myotis daubentonii
EIS and Road Surveys - Conor Kelleher	O1640	22/06/2005	Pipistrellus pygmaeus,Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
EIS and Road Surveys - Conor Kelleher	O1344	14/09/2002	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Plecotus auritus,Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O1444	14/09/2002	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Plecotus auritus,Nyctalus leisleri
EIS and Road Surveys - Conor Kelleher	O1544	14/09/2002	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Plecotus auritus,Nyctalus leisleri
EIS surveys - Brian Keeley	O0438	03/09/2005	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis mystacinus,Myotis daubentonii
EIS surveys - Brian Keeley	O0235	01/09/2005	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
EIS surveys - Brian Keeley	O0935	02/09/2005	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis mystacinus
EIS surveys - Brian Keeley	O0536	09/09/2005	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii,Nyctalus leisleri,Myotis nattereri,Plecotus auritus
EIS surveys - Brian Keeley	O0735	01/09/2005	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus,Myotis daubentonii
EIS surveys - Brian Keeley	O1237	06/06/2006	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
EIS surveys - Brian Keeley	O1641	02/06/2006	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
EIS surveys - Brian Keeley	O0735	10/08/2006	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS surveys - Brian Keeley	O1342	30/08/2007	Nyctalus leisleri
EIS surveys - Brian Keeley	O1237	13/09/2010	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS surveys - Brian Keeley	O1151	03/08/2012	Myotis daubentonii,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Plecotus auritus
EIS surveys - Brian Keeley	O1037	04/05/2013	Myotis daubentonii,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS Surveys - Caroline Shiel	O1135	04/06/2007	Nyctalus leisleri
EIS Surveys - Niamh Roche	O0046	24/05/2000	Nyctalus leisleri

EIS Surveys - Niamh Roche	O0046	24/05/2000	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
EIS Surveys - Niamh Roche	N9947	25/05/2000	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz)
EIS Surveys - Niamh Roche	N9652	2003-09-00	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz)
EIS Surveys - Niamh Roche	O0136	08/07/2002	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Plecotus auritus
EIS Surveys - Niamh Roche	O0234	02/08/2007	Pipistrellus pipistrellus (45kHz)
EIS Surveys - Niamh Roche	O0235	02/08/2007	Nyctalus leisleri
EIS Surveys - Niamh Roche	O0234	02/08/2007	Myotis spp.
EIS Surveys - Niamh Roche	O0235	02/08/2007	Pipistrellus pygmaeus
EIS Surveys - Niamh Roche	O1047	09/05/2006	Pipistrellus pygmaeus
EIS Surveys - Niamh Roche	O1047	09/05/2006	Pipistrellus pipistrellus (45kHz)
EIS Surveys - Niamh Roche	O1047	09/05/2006	Pipistrellus pipistrellus (45kHz),Myotis mystacinus/brandtii
EIS Surveys - Niamh Roche	O1048	09/05/2006	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
EIS Surveys - Niamh Roche	O1047	09/05/2006	Myotis mystacinus/brandtii
Faith Wilson	O0836	11/06/2008	Myotis spp.,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri
Faith Wilson	O1433	01/08/2007	Nyctalus leisleri
Faith Wilson	O0133	01/09/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Faith Wilson	O0233	31/08/2009	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Plecotus auritus
Faith Wilson	O0433	12/07/2010	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
Faith Wilson	O0640	07/10/2007	Nyctalus leisleri,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus
Faith Wilson	O0640	07/10/2007	Myotis daubentonii,Pipistrellus pygmaeus
Faith Wilson	O0739	07/10/2007	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri
Faith Wilson	O0838	11/08/2008	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii
Faith Wilson	O0838	09/10/2007	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii,Plecotus auritus
Faith Wilson	O0938	09/10/2007	Pipistrellus pipistrellus (45kHz)
John Curtin	O0635	18/09/2017	Myotis daubentonii
Niamh Roche	O0834	20/04/2006	Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz)

Bat species recorded by static SongMeter Mini monitor between August 2nd and 3rd 2023

Date	Time	Manual Id
02/08/2023	22:57:30	Leisler's Bat
02/08/2023	22:59:04	Common Pipistrelle
02/08/2023	22:59:09	Common Pipistrelle
02/08/2023	23:00:18	Common Pipistrelle
02/08/2023	23:00:43	Common Pipistrelle
02/08/2023	23:01:15	Common Pipistrelle
02/08/2023	23:01:33	Common Pipistrelle
02/08/2023	23:02:43	Common Pipistrelle
02/08/2023	23:03:32	Common Pipistrelle

02/08/2023	23:03:49	Common Pipistrelle
02/08/2023	23:04:04	Common Pipistrelle
02/08/2023	23:04:19	Common Pipistrelle
02/08/2023	23:05:48	Common Pipistrelle
02/08/2023	23:06:05	Common Pipistrelle
02/08/2023	23:06:21	Common Pipistrelle
02/08/2023	23:07:10	Common Pipistrelle
02/08/2023	23:07:23	Common Pipistrelle
02/08/2023	23:07:32	Common Pipistrelle
02/08/2023	23:07:41	Common Pipistrelle
02/08/2023	23:07:56	Common Pipistrelle
02/08/2023	23:08:11	Common Pipistrelle
02/08/2023	23:08:27	Common Pipistrelle
02/08/2023	23:08:44	Common Pipistrelle
02/08/2023	23:09:00	Common Pipistrelle
02/08/2023	23:09:35	Common Pipistrelle
02/08/2023	23:09:54	Common Pipistrelle
02/08/2023	23:10:09	Common Pipistrelle
02/08/2023	23:10:44	Common Pipistrelle
02/08/2023	23:11:06	Soprano Pipistrelle
02/08/2023	23:11:43	Common Pipistrelle
02/08/2023	23:14:28	Common Pipistrelle
02/08/2023	23:14:34	Common Pipistrelle
02/08/2023	23:14:50	Common Pipistrelle
02/08/2023	23:15:35	Common Pipistrelle
02/08/2023	23:15:51	Common Pipistrelle
02/08/2023	23:16:24	Common Pipistrelle
02/08/2023	23:16:30	Common Pipistrelle
02/08/2023	23:16:46	Common Pipistrelle
02/08/2023	23:17:20	Common Pipistrelle
02/08/2023	23:17:30	Common Pipistrelle
02/08/2023	23:17:40	Common Pipistrelle
02/08/2023	23:18:49	Soprano Pipistrelle
02/08/2023	23:19:30	Common Pipistrelle
02/08/2023	23:19:44	Common Pipistrelle
02/08/2023	23:20:16	Common Pipistrelle
02/08/2023	23:21:07	Common Pipistrelle
02/08/2023	23:21:23	Common Pipistrelle
02/08/2023	23:21:52	Common Pipistrelle
02/08/2023	23:22:04	Common Pipistrelle
02/08/2023	23:22:54	Common Pipistrelle
02/08/2023	23:23:49	Common Pipistrelle
02/08/2023	23:25:21	Common Pipistrelle
02/08/2023	23:25:59	Common Pipistrelle
02/08/2023	23:26:09	Common Pipistrelle
02/08/2023	23:27:40	Common Pipistrelle

02/08/2023	23:28:05	Common Pipistrelle
02/08/2023	23:29:44	Leisler's Bat
02/08/2023	23:33:31	Common Pipistrelle
02/08/2023	23:34:17	Soprano Pipistrelle
02/08/2023	23:35:00	Common Pipistrelle
02/08/2023	23:35:15	Common Pipistrelle
02/08/2023	23:35:29	Common Pipistrelle
02/08/2023	23:35:45	Common Pipistrelle
02/08/2023	23:37:05	Common Pipistrelle
02/08/2023	23:37:20	Common Pipistrelle
02/08/2023	23:38:08	Common Pipistrelle
02/08/2023	23:38:23	Common Pipistrelle
02/08/2023	23:38:38	Common Pipistrelle
02/08/2023	23:44:30	Leisler's Bat
03/08/2023	00:03:40	Common Pipistrelle
03/08/2023	00:13:42	Common Pipistrelle
03/08/2023	00:14:01	Soprano Pipistrelle
03/08/2023	00:16:45	Common Pipistrelle
03/08/2023	00:18:00	Common Pipistrelle
03/08/2023	00:22:08	Common Pipistrelle
03/08/2023	00:22:22	Common Pipistrelle
03/08/2023	00:22:38	Common Pipistrelle
03/08/2023	00:22:58	Common Pipistrelle
03/08/2023	00:24:33	Common Pipistrelle
03/08/2023	00:24:49	Soprano Pipistrelle
03/08/2023	00:25:07	Common Pipistrelle
03/08/2023	00:25:33	Common Pipistrelle
03/08/2023	00:26:24	Common Pipistrelle
03/08/2023	00:27:26	Soprano Pipistrelle
03/08/2023	00:30:31	Common Pipistrelle
03/08/2023	00:32:42	Common Pipistrelle
03/08/2023	00:33:00	Common Pipistrelle
03/08/2023	00:33:06	Common Pipistrelle
03/08/2023	00:33:22	Common Pipistrelle
03/08/2023	00:35:32	Common Pipistrelle
03/08/2023	00:35:50	Common Pipistrelle
03/08/2023	00:35:59	Common Pipistrelle
03/08/2023	00:36:09	Common Pipistrelle
03/08/2023	00:36:41	Common Pipistrelle
03/08/2023	00:37:18	Common Pipistrelle
03/08/2023	00:37:32	Common Pipistrelle
03/08/2023	00:37:43	Soprano Pipistrelle
03/08/2023	00:39:31	Leisler's Bat
03/08/2023	00:42:39	Common Pipistrelle
03/08/2023	00:42:51	Common Pipistrelle
03/08/2023	00:43:46	Common Pipistrelle

03/08/2023	00:44:53	Common Pipistrelle
03/08/2023	00:46:07	Common Pipistrelle
03/08/2023	00:47:16	Common Pipistrelle
03/08/2023	00:47:42	Common Pipistrelle
03/08/2023	00:48:37	Common Pipistrelle
03/08/2023	00:50:33	Common Pipistrelle
03/08/2023	00:51:18	Common Pipistrelle
03/08/2023	01:09:51	Leisler's Bat
03/08/2023	01:24:26	Soprano Pipistrelle
03/08/2023	01:39:44	Common Pipistrelle
03/08/2023	01:44:16	Common Pipistrelle
03/08/2023	01:47:15	Common Pipistrelle
03/08/2023	01:56:11	Common Pipistrelle
03/08/2023	02:09:24	Soprano Pipistrelle
03/08/2023	02:41:25	Common Pipistrelle
03/08/2023	03:16:31	Common Pipistrelle
03/08/2023	03:30:22	Common Pipistrelle
03/08/2023	03:50:02	Soprano Pipistrelle
03/08/2023	04:02:15	Common Pipistrelle
03/08/2023	04:04:13	Common Pipistrelle
03/08/2023	04:05:42	Common Pipistrelle
03/08/2023	04:46:41	Leisler's Bat
03/08/2023	04:46:52	Leisler's Bat
03/08/2023	04:47:05	Leisler's Bat
03/08/2023	04:50:32	Leisler's Bat
03/08/2023	05:10:23	Leisler's Bat

Bat species recorded by surveyor 1 using an EchoMeter Touch between August 2nd and 3rd 2023

Date	Time	Manual Id
02/08/2023	21:30:20	Leisler's Bat
02/08/2023	21:57:27	Leisler's Bat
02/08/2023	21:59:36	Leisler's Bat
02/08/2023	21:59:52	Soprano Pipistrelle
02/08/2023	22:00:07	Soprano Pipistrelle
02/08/2023	22:07:30	Common Pipistrelle
02/08/2023	22:09:34	Leisler's Bat
02/08/2023	22:12:18	Leisler's Bat
02/08/2023	22:16:57	Leisler's Bat
02/08/2023	22:20:12	Leisler's Bat
02/08/2023	22:31:24	Common Pipistrelle
02/08/2023	22:34:10	Soprano Pipistrelle
02/08/2023	22:35:24	Common Pipistrelle
02/08/2023	22:35:39	Common Pipistrelle
02/08/2023	22:44:53	Common Pipistrelle
02/08/2023	22:45:37	Common Pipistrelle
02/08/2023	22:47:50	Common Pipistrelle
02/08/2023	22:48:57	Common Pipistrelle
02/08/2023	22:50:18	Common Pipistrelle
03/08/2023	04:43:37	Soprano Pipistrelle
03/08/2023	04:43:43	Soprano Pipistrelle
03/08/2023	04:43:50	Soprano Pipistrelle
03/08/2023	04:43:59	Soprano Pipistrelle
03/08/2023	04:44:17	Soprano Pipistrelle
03/08/2023	04:44:25	Soprano Pipistrelle
03/08/2023	04:58:59	Soprano Pipistrelle
03/08/2023	05:05:15	Leisler's Bat
03/08/2023	05:05:39	Leisler's Bat
03/08/2023	05:06:12	Leisler's Bat
03/08/2023	05:06:28	Leisler's Bat
03/08/2023	05:09:42	Leisler's Bat
03/08/2023	05:10:01	Leisler's Bat
03/08/2023	05:10:39	Leisler's Bat
03/08/2023	05:14:51	Leisler's Bat
03/08/2023	05:14:55	Leisler's Bat

Bat species recorded by surveyor 2 using an Anabat Walkabout between August 2nd and 3rd 2023

Date	Time	Manual Id
02/08/2023	21:58:04	Common Pipistrelle
02/08/2023	22:00:18	Soprano Pipistrelle
02/08/2023	22:06:21	Soprano Pipistrelle
02/08/2023	22:07:16	Leisler's Bat
02/08/2023	22:07:33	Common Pipistrelle
02/08/2023	22:39:52	Soprano Pipistrelle
02/08/2023	22:39:59	Soprano Pipistrelle
02/08/2023	22:42:34	Leisler's Bat
02/08/2023	22:50:46	Common Pipistrelle
02/08/2023	22:55:15	Soprano Pipistrelle
02/08/2023	23:20:22	Leisler's Bat
02/08/2023	23:24:18	Soprano Pipistrelle
03/08/2023	04:21:57	Leisler's Bat
03/08/2023	05:45:08	Soprano Pipistrelle
03/08/2023	05:54:09	Leisler's Bat

Appendix 8.2 Outline Biosecurity Plan

Introduction

This document presents an outline Biosecurity Plan for the construction phase of the proposed Hollystown – Kilmartin Site 4 development at Hollystown and Kilmartin, 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 the Local Authority, 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.

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 (SI No. 477/2011) 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.

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);



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- 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.

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)*.

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)*.

Recommended Measures

At a minimum, the following measures are recommended:



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 pose 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.

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)*.

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



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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.

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.

Works in the aquatic environment will be carried out with particular care to avoid the introduction or dispersal of invasive alien species. Works in these areas should be carried out in accordance with the check-clean-dry protocol (with designated wash-down areas with cleaning equipment, wheel-washes and boot-washes provided, where appropriate) 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*.

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-TII, 2009)

Table 1 Criteria for Rating Site Attributes – Estimation of Importance of Soil and Geology Attributes (NRA) (NRA-TII, 2009)

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



Importance	Criteria	Typical Example
Low	<p>Attribute has a low quality, significance or value on a local scale.</p> <p>Degree or extent of soil contamination is minor on a local scale.</p> <p>Volume of peat and/or soft organic soil underlying route is small on a local scale.</p>	<p>Large historical and/or recent site for construction and demolition wastes.</p> <p>Small historical and/or recent landfill site for construction and demolition wastes.</p> <p>Poorly drained and/or low fertility soils.</p> <p>Uneconomically extractable mineral resource.</p>

Table 2 Criteria for Rating Site Attributes – Estimation of Importance of Hydrogeological Attributes (NRA, 2009)

Importance	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	<p>Regionally Important Aquifer with multiple well fields.</p> <p>Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status.</p> <p>Regionally important potable water source supplying >2500homes.</p> <p>Inner source protection area for regionally important water source.</p>
High	Attribute has a high quality or value on a local scale	<p>Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers.</p> <p>Locally important potable water source supplying >1000 homes.</p> <p>Outer source protection area for regionally important water source.</p> <p>Inner source protection area for locally important water source.</p>
Medium	Attribute has a medium quality or value on a local scale	<p>Locally Important Aquifer.</p> <p>Potable water source supplying >50 homes. Outer source protection area for locally important water source.</p>



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Importance	Criteria	Typical Examples
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 3 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Soil/ Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves. Irreversible loss of high proportion of local high fertility soils. Removal of entirety of geological heritage feature. Requirement to excavate/remediate entire waste site. Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
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. Removal of part of geological heritage feature. Irreversible loss of moderate proportion of local high fertility soils. Requirement to excavate/remediate significant proportion of waste site. Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.
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. Removal of small part of geological heritage feature. Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Requirement to excavate/remediate small proportion of waste site. Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes



Magnitude of Impact	Criteria	Typical Examples
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 4 Criteria for Rating Impact Significance at EIA Stage – Estimation of Magnitude of Impact on Hydrogeological Attribute (NRA)

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.



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Magnitude of Impact	Criteria	Typical Examples
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 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 9.2 Ground Investigation Ireland – Ground Investigation Report (2018)





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Development at Hollystown Golf Club

Ground Investigation Report

DOCUMENT CONTROL SHEET

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APPENDICES

Appendix 1	Site Location Plan
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Appendix 3	Trial Pitting Photographs
Appendix 4	Soakaway Testing Results

1.0 Preamble

On the instructions of DBFL Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd. in July 2018 at the site of the proposed development at Hollystown Golf Club, Hollystown, Co. Dublin.

2.0 Overview

2.1. Background

It is proposed to construct a new residential development with associated services and car parking at the proposed site. The site is currently an active golf course and is situated in Hollystown, North Dublin. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Carry out 4 No. Trial Pit to a maximum depth of 2.00m BGL
- Carry out 4 No. Soakaway to determine a soil infiltration value to BRE digest 365
- Report with recommendations

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.

The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

3.1. Trial Pits

The trial pits were excavated using a 3.5T tracked excavator at the location shown in the exploratory hole location plan in Appendix 1. The location was checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pit was sampled, logged and photographed by a

Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 with associated photographs in Appendix 3 of this Report.

3.2. Soakaway Testing

The soakaway testing was carried out the trial pit at the location shown in the exploratory hole location plan in Appendix 1. The pit was carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pit was allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pit was logged prior to completing the soakaway test and was backfilled with arising's upon completion. The soakaway test result is provided in Appendix 4 of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were consistent across the site and are generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits

TOPSOIL: Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.15m BGL.

MADE GROUND: Made Ground deposits were encountered in SA03 beneath the Topsoil and was present to a depth of 0.30m BGL. These deposits were described generally as *brown slightly sandy slightly gravelly Clay with occasional cobbles and contained occasional fragments of plastic.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Topsoil and Made Ground and were described typically as *grey or brown slightly sandy slightly gravelly CLAY with occasional cobbles*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was firm or firm to stiff below 1.5m BGL in the majority of the exploratory holes. These deposits had occasional, some or many cobble content where noted on the exploratory hole logs.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Soakaway Design

Infiltration rates of 1.980×10^{-6} and 1.955×10^{-6} m/s respectively were calculated for the soakaway locations SA02 and SA03. At the locations of SA01 and SA04 the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

APPENDIX 1 - Site Location Plan

LEGEND

 SOAKAWAY TEST

 TRIAL PIT

TEST TYPE	TEST NUMBERING RANGE	NO. OF TESTS
Soakaways	SA01 - SA04	4
Trial Pit	TP01 - TP03	3

Note: Red line is not subject application site



LOCATION: HOLLYSTOWN GOLF COURSE, CO. DUBLIN

SCALE: NTS

DBFL REF: 170182

APPENDIX 2 – Trial Pitting Records



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Site
Development at Hollystown Golf Club

Trial Pit Number
SA01

Machine : 3.5T Excavator Method : Trial Pit	Dimensions 2.10m X 0.50m X 1.70m	Ground Level (mOD)	Client DBFL	Job Number 7929-07-18
	Location	Dates 01/08/2018	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
					0.50	Stiff brown slightly sandy slightly gravelly CLAY with rare sub-angular to sub-rounded cobbles of limestone and granite. Gravel is sub-angular to sub-rounded fine to coarse limestone and granite.		
					0.60	Stiff greyish brown slightly sandy gravelly CLAY with rare sub-angular to sub-rounded cobbles of limestone and granite. Gravel is sub-angular to sub-rounded fine to coarse limestone and granite.		
					0.90			
					1.50	Trial pit completed at scheduled depth. Complete at 1.50m		

Plan .	Remarks No Groundwater encountered. Trial pit stable. Soakaway completed in trial pit. Trial pit backfilled on completion on of soakaway test.		
	Scale (approx) 1:25	Logged By Tmcl	Figure No. 7929-07-18.SA01



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Site
Development at Hollystown Golf Club

Trial Pit Number
SA02

Machine : 3.5T Excavator Method : Trial Pit	Dimensions 2.10m X 0.50m X 1.70m	Ground Level (mOD)	Client DBFL	Job Number 7929-07-18
	Location	Dates 01/08/2018	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.10	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
					0.20	Firm brown slightly sandy gravelly CLAY with rare sub-angular cobbles of limestone. Gravel is angular to sub-angular fine to coarse limestone.		
				0.30				
					(0.90)	Firm greyish brown slightly sandy gravelly CLAY with occasional sub-angular cobbles of limestone. Gravel is sub-angular fine to coarse limestone.		
					1.20	Firm to stiff dark brown sandy gravelly CLAY with occasional sub-rounded boulders of limestone. Gravel is sub-angular to sub-rounded fine to coarse limestone.		
				(0.50)				
					1.70	Trial pit completed at scheduled depth.		
						Complete at 1.70m		

Plan .	Remarks		
	No Groundwater encountered. Trial pit stable. Soakaway completed in trial pit. Trial pit backfilled on completion on of soakaway test.		
	Scale (approx)	Logged By	Figure No.
	1:25	Tmcl	7929-07-18.SA02



Ground Investigations Ireland Ltd
www.gii.ie

Site
Development at Hollystown Golf Club

Trial Pit Number
SA03

Machine : 3.5T Excavator Method : Trial Pit	Dimensions 2.10m X 0.50m X 1.70m	Ground Level (mOD)	Client DBFL	Job Number 7929-07-18
	Location	Dates 01/08/2018	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05 (0.25)	FILL: Dark grey slightly sandy gravelly Clay. Gravel is angular to sub-angular fine to coarse limestone.		
					0.30 (0.50)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with rare sub-angular limestone cobbles and rare fragments of plastic. Stiff brown slightly sandy slightly gravelly CLAY with occasional sub-rounded limestone cobbles.		
					0.80 (0.45)	Firm to stiff grey mottled brown slightly sandy gravelly CLAY. Gravel is sub-angular to sub-rounded limestone.		
					1.25 (0.45)	Firm dark grey slightly sandy slightly gravelly CLAY with occasional sub-angular cobbles of limestone. Gravel is sub-angular to sub-rounded limestone.		
					1.70	Trial pit completed at scheduled depth. Complete at 1.70m		

Plan .	Remarks Groundwater encountered at 1.65m BGL - slight seepage. Trial pit stable. Soakaway completed in trial pit. Trial pit backfilled on completion on of soakaway test.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Figure No.</td> </tr> <tr> <td align="center">1:25</td> <td align="center">Tmcl</td> <td align="center">7929-07-18.SA03</td> </tr> </table>	Scale (approx)	Logged By	Figure No.	1:25	Tmcl
Scale (approx)	Logged By	Figure No.				
1:25	Tmcl	7929-07-18.SA03				



Ground Investigations Ireland Ltd
www.gii.ie

Site
Development at Hollystown Golf Club

Trial Pit Number
SA04

Machine : 3.5T Excavator Method : Trial Pit	Dimensions 2.30m X 0.50m X 1.60m	Ground Level (mOD)	Client DBFL	Job Number 7929-07-18
	Location	Dates 01/08/2018	Project Contractor Ground Investigations Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.15	Dark brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
					0.35	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse limestone.		
					0.40	Firm to stiff brown slightly sandy gravelly CLAY with occasional angular to sub-angular cobbles of limestone. Gravel is sub-angular to sub-rounded fine to coarse limestone.		
					0.70	Firm grey mottled brown slightly sandy slightly gravelly CLAY with rare cobbles of sub-rounded limestone. Gravel is sub-angular to sub-rounded fine to coarse limestone.		
					1.60	Trial pit completed at scheduled depth. Complete at 1.60m		

Plan .	Remarks No Groundwater encountered. Trial pit stable. Soakaway completed in trial pit. Trial pit backfilled on completion on of soakaway test.		
	<table border="1"> <tr> <td>Scale (approx) 1:25</td> <td>Logged By Tmcl</td> <td>Figure No. 7929-07-18.SA04</td> </tr> </table>	Scale (approx) 1:25	Logged By Tmcl
Scale (approx) 1:25	Logged By Tmcl	Figure No. 7929-07-18.SA04	

APPENDIX 3 – Trial Pitting Photographs

Hollystown Golf Course – Trial Pit Photographs

SA01



SA02



SA03



SA04



APPENDIX 4 – Soakaway Testing Results

SA01

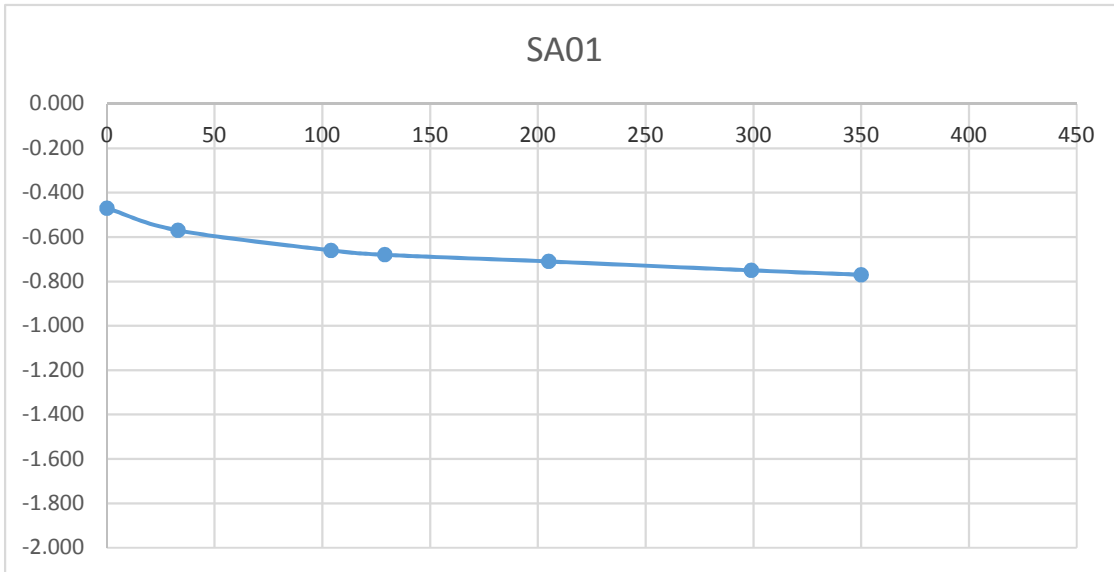
Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.10m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
02/08/2018	0	-0.470
02/08/2018	33	-0.570
02/08/2018	104	-0.660
02/08/2018	129	-0.680
02/08/2018	205	-0.710
02/08/2018	299	-0.750
02/08/2018	350	-0.770

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.47	1.500	1.030	0.7275	1.2425



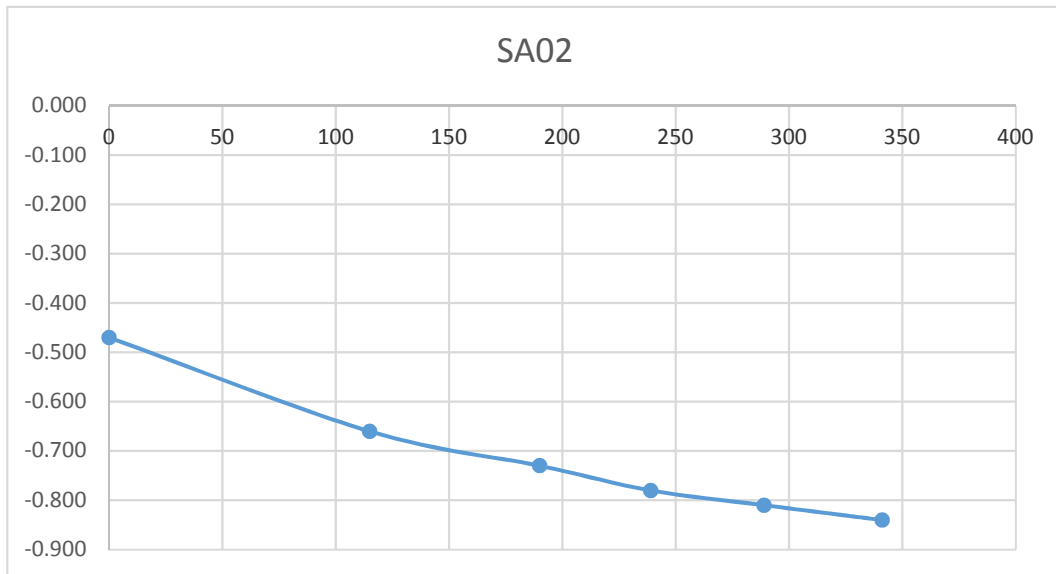
SA02

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.30m x 0.50m x 1.70m (L x W x D)

Date	Time	Water level (m bgl)
02/08/2018	0	-0.470
02/08/2018	115	-0.660
02/08/2018	190	-0.730
02/08/2018	239	-0.780
02/08/2018	289	-0.810
02/08/2018	341	-0.840

Start depth 0.47	Depth of Pit 1.700	Diff 1.230	75% full 0.7775	25%full 1.3925
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.300	0.500		0.615	0.71
Tp75-25 (from graph) (s)		77750	50% Eff Depth	ap50 (m2)
			0.615	4.594
f =		1.980E-06	m/s	



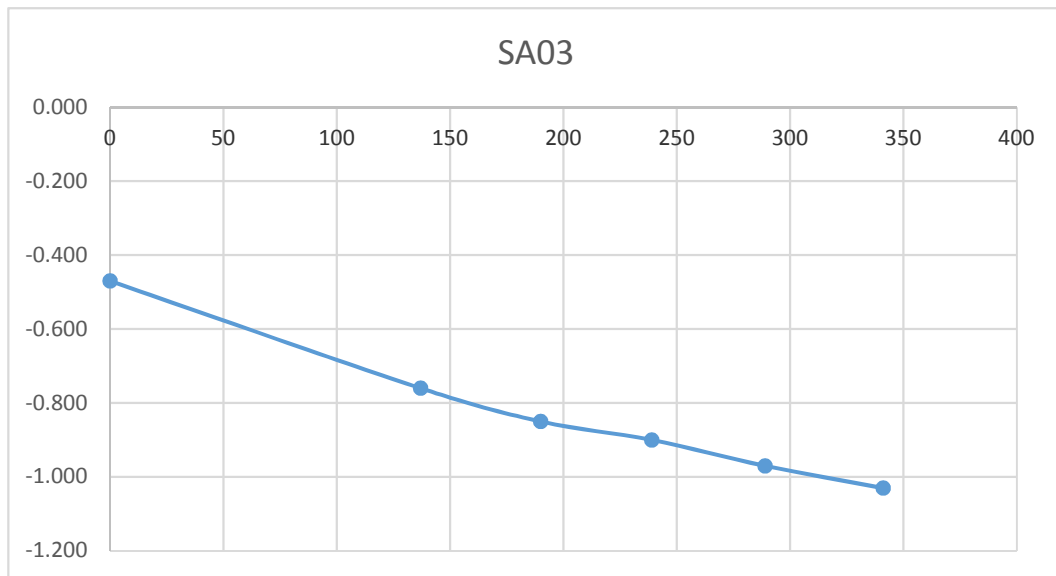
SA03

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.10m x 0.50m x 1.70m (L x W x D)

Date	Time	Water level (m bgl)
02/08/2018	0	-0.470
02/08/2018	137	-0.760
02/08/2018	190	-0.850
02/08/2018	239	-0.900
02/08/2018	289	-0.970
02/08/2018	341	-1.030

Start depth 0.47	Depth of Pit 1.700	Diff 1.230	75% full 0.7775	25%full 1.3925
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
2.100	0.500		0.615	0.65
Tp75-25 (from graph) (s)		77750	50% Eff Depth	ap50 (m2)
f =		1.955E-06	0.615	4.248
		m/s		



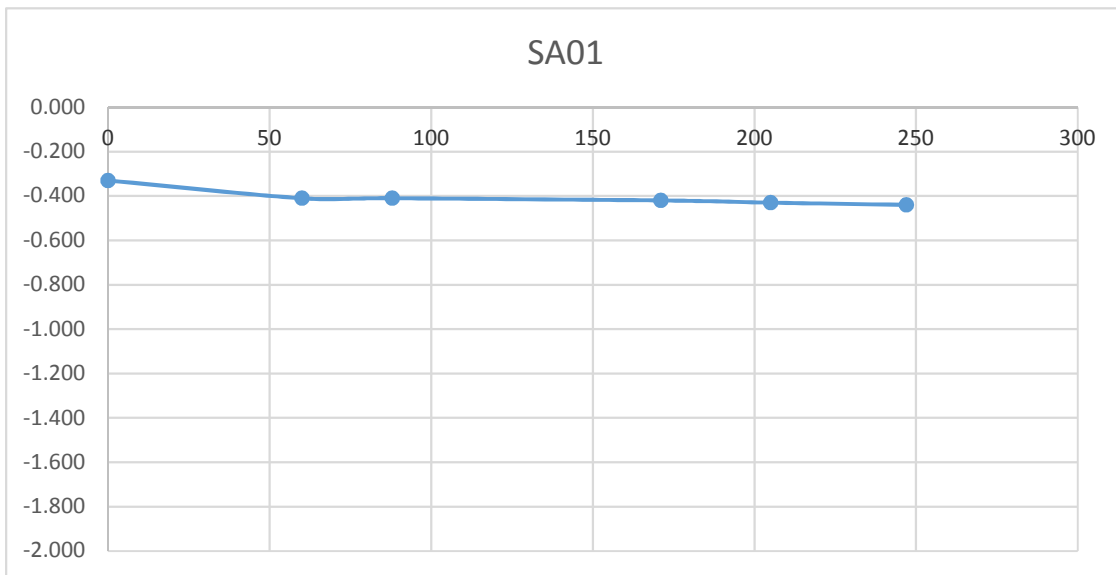
SA04

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 2.30m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
02/08/2018	0	-0.330
02/08/2018	60	-0.410
02/08/2018	88	-0.410
02/08/2018	171	-0.420
02/08/2018	205	-0.430
02/08/2018	247	-0.440

*Soakaway failed - Pit backfilled				
Start depth	Depth of Pit	Diff	75% full	25%full
0.33	1.600	1.270	0.6475	1.2825



Appendix 10.1 NRA Criteria for Rating Attributes – Estimation of Importance of Hydrology Attributes

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.



Hollystown-Kilmartin Site 4

Environmental Impact Assessment Report (EIAR) Volume 3 : Appendices

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.
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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 11.1 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 where 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;
- Bowers 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 11.2 Glenveagh Climate Policy – Net Zero Transition Plan 2030



Glenveagh

Home of the new.

Building for a Better Climate

NET ZERO TRANSITION PLAN 2023

WELCOME

We build for everyone

ABOUT GLENVEAGH

Supported by innovation and supply-chain integration, Glenveagh is committed to opening up access to sustainable high-quality homes to as many people as possible in flourishing communities across Ireland.

ABOUT THIS DOCUMENT

This is our first Net Zero Transition Plan. The aim of this document is to provide our stakeholders with transparency around our ambitions and actions on our journey towards decarbonisation. This plan will evolve and be updated over time. Feedback is welcome. Please get in touch by emailing sustainability@glenveagh.ie.

Our Vision

At Glenveagh, our vision is that everyone should have the opportunity to access great-value, high-quality homes in flourishing communities across Ireland.

Our Mission

Our mission is to innovate how new homes are planned, designed, built and marketed in Ireland, and to make the journey for customers transparent, easy and joyful.

Our Culture

At Glenveagh, we foster a culture of fresh thinking, teamwork and trust to challenge the status quo in our industry. We believe that building homes and communities will positively impact Irish society. We want to forge a new path, relentlessly innovating every stage of the homebuilding process.



Our Values

Our company values of **Safety first, Innovative, Can-do, Collaborative** and **Customer-centred** inform everything we do and how we do it. These values are integral to building an inclusive Glenveagh that we are all proud to be part of.



SAFETY FIRST
Before everything else, safety comes first.



COLLABORATIVE
We believe in the power of teamwork to create new possibilities.



INNOVATIVE
Each day we work to bring new ideas home.



CUSTOMER-CENTERED
Customers are at the heart of every decision we make.



CAN-DO
With the right attitude we can achieve anything.

INTRODUCTION

Introducing our Net Zero Transition Plan



It is clear that urgent action on climate change is required. The UN has described the latest science from the Intergovernmental Panel on Climate Change (IPCC) – as “code red for humanity”. However, we know that if we all act now it is still possible to limit global temperature rise to 1.5°C. This involves making rapid and deep cuts to emissions.

At Glenveagh, we have placed sustainability, and climate change in particular, at the heart of our new Building Better strategy. This allows us to respond effectively to climate risks and opportunities through each of our five strategic priorities, ensuring action on climate change is at the heart of how we innovate, the places we create and the skills we nurture in our people.

This Net Zero Transition Plan supports our Building Better strategy and sets out both our near and long term approach to climate change, which includes demanding science-based targets that we must hold our business to achieving.

The journey towards net zero is complex and challenging. However, we have already made great progress in reducing the operational energy of our homes. We are confident that with the same determination we can achieve our ambitious targets.

This plan sets out the key actions as we see them now. We have already invested significant time in improving our baseline information and we will continue to strive for more robust data to help inform our decisions. We will explore new and innovative technologies to help us on our journey and foster a spirit of collaboration with industry partners, our suppliers and subcontractors and other stakeholders as necessary.

Stephen Garvey
Chief Executive Officer

SETTING THE SCENE

Global context

The IPCC has delivered its strongest warnings yet in its Sixth Assessment Report (2021) – “Unless there are immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C will be beyond reach”. Greenhouse gas emissions ('GHGs') are at the highest levels in human history over the last decade. It is clear that urgent action is needed.

The Paris Climate Agreement sets out the global pathway for this action. It is a legally binding international treaty on climate change adopted at COP 21 in Paris in December 2015. Its goal is to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. The Glasgow Climate Pact, agreed at COP 26 in Glasgow, aims to accelerate efforts by countries to align with the Paris Agreement goals.

Europe

The European Union ('EU') has been to the forefront of action on climate change particularly in recent years. The European Green Deal sets out its vision for a climate-neutral EU and this was written into law through the European Climate Law in 2021. This means achieving net zero GHGs for EU countries as a whole by 2050, while also setting out an intermediate target of reducing net GHGs by at least 55% by 2030, compared to 1990 levels. To support this, the EU published 'Fit for 55', an ambitious package of objectives and plans to be implemented by 2030.

What is net zero?

Achieving net zero means reducing GHGs emissions (Scopes 1, 2 and 3) to zero or to a residual level and neutralising any residual emissions through the permanent removal and storage of carbon from the atmosphere. Net zero is essentially about balancing the emissions put into the atmosphere and those taken out.

“

IRELAND IS ON A LEGALLY BINDING PATH TO NET ZERO EMISSIONS NO LATER THAN 2050.

”

Ireland

Ireland's Climate Action and Low Carbon Development (Amendment) Act 2021 was signed into law in July 2021. It places Ireland on a legally binding path to net zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade, providing a framework for Ireland to meet its international and EU climate commitments. The latest iteration of the Climate Action Plan 2023 ('CAP23'), implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for action (including for the built environment).

Built environment

In Ireland, the construction and built environment sectors account for 37% of Ireland's carbon emissions. That breaks down into 23% from operational emissions i.e. heating, cooling and lighting buildings, with the remaining 14% from embodied carbon i.e. the manufacturing, transport and installation of building materials.



51%

Reduction in emissions by the end of this decade in Ireland.

OUR CLIMATE STORY

Colour Key

- Glenveagh climate actions
- Global, regional and national climate milestones

2023

- Building Better strategy published with sustainability embedded throughout.
- First sustainability-linked financing facility.
- Ireland's Climate Action Plan 2023 published.

2022

- Joined Irish Green Building Council (IGBC).
- Signed Low Carbon Pledge committing to setting science-based targets ('SBTs').
- Commenced Hydrotreated Vegetable Oil ('HVO') trials.
- CDP rating B.
- Ireland's first carbon budget programme approved.
- Ireland's Sectoral Emissions Ceilings agreed.

2021

- Sustainability governance structures set up.
- First climate target set.
- CDP rating A-.
- Electric vehicles ('EVs') introduced to fleet.
- Published full Scope 3 emissions.
- European Climate Law is adopted.
- Ireland's Climate Action and Low Carbon Development (Amendment) Act 2021 approved.

2020

- First sustainability report published.
- Reported Scope 1 and 2 emissions with external assurance.
- First CDP disclosure – B rating achieved.
- The European Green Deal was approved.

2019

- Sustainability approach agreed by Board.
- EU leaders agree to make the EU climate neutral by 2050.

2018

- Capital deployed in line with Group vision.
- UN IPCC releases its 1.5°C special report.

2017

- Company founded.
- Governance framework implemented.



OUR APPROACH

Embedding our **Net Zero** Transition Plan into our business strategy

In 2022, we began an extensive process to evolve the Glenveagh business strategy. We aimed to build on the successes of our existing strategic and sustainability priorities, positioning ourselves optimally to address the needs of stakeholders and to manage future opportunities and challenges. We have placed environmental and social issues at the heart of our business strategy and have integrated our sustainability and business priorities into one overarching strategy. Our Net Zero Transition Plan supports this with key actions embedded throughout our strategic priorities.

Net Zero Transition Plan

Strategic Priorities

How our approach to net zero is embedded



Placing the customer first

- High quality, energy efficient, homes.
- Educating customers on reducing their carbon emissions.



Valuing and developing our colleagues

- Developing sustainability and climate skills across the business.



Driving operational excellence

- Driving efficiency in resource use to reduce GHG emissions.
- Using renewable fuels where possible.

Creating sustainable and thriving places

- Building communities that support sustainability.
- Nature-based solutions to climate impacts/potential impacts.



Embracing innovation

- Driving innovation in design, materials used, offsite manufacturing etc. to reduce embodied carbon of our homes.

OUR EMISSIONS

Understanding our emissions

To set a science-based target, it is important that we have a thorough understanding of our base year emissions.

The base year we have chosen is 2021. We first disclosed our Scope 1 and 2 emissions in 2020 and in the following year we disclosed our Scope 3 emissions. We use the Greenhouse Gas Protocol operational control methodology to calculate our emissions. We have worked continuously over that time, and will continue to do so, to improve our methodology as well as the quality of the data to progress the accuracy and completeness of our emissions.

In 2021 our total emissions were 192,184 tCO₂e. Of these 2% were in Scopes 1 and 2, while the remaining 98% was in Scope 3.

More information on Glenveagh's baseline emissions including the methodology used, verification and standards can be found at <https://glenveagh.ie/corporate/sustainability>

192,184 tCO₂e

Total emissions in 2021

Scopes 1 and 2

Much of our Scope 1 emissions come from fossil fuels used on our sites to run generators, plant and machinery. The remainder is from our own fleet of vans and cars, while a small amount of natural gas is also used. Our Scope 2 emissions arise from electricity used in our offices, factories and sites.

Scope 3

In line with the Greenhouse Gas Protocol, a materiality assessment has been performed on known attributable emissions within the system boundary, ensuring that over 95% of the anticipated life cycle GHG value chain emissions were covered by the scope.

A large proportion (42%) of our Scope 3 emissions sit within the 'capital goods' category and represent the embodied carbon within the houses and apartments that we build i.e. the extraction and production of the materials with which we build. The transportation of these materials and the end of life treatment are also captured within Scope 3 although these represent a small percentage – three and two per cent respectively.

Another significant element of our Scope 3 emissions is the fuel used by our subcontractors on site (22%). This makes up almost all of the emissions from the purchased goods and services category.

The remaining significant element of our Scope 3 emissions is the occupant energy i.e. energy used over a 50 year period, by those that live in the houses and apartments that we build. This makes up 27% of the total emissions.

The remaining emissions comprise business travel, employee commuting, treatment of waste and losses relating to electricity and fuel consumption.



OUR EMISSIONS CONTINUED

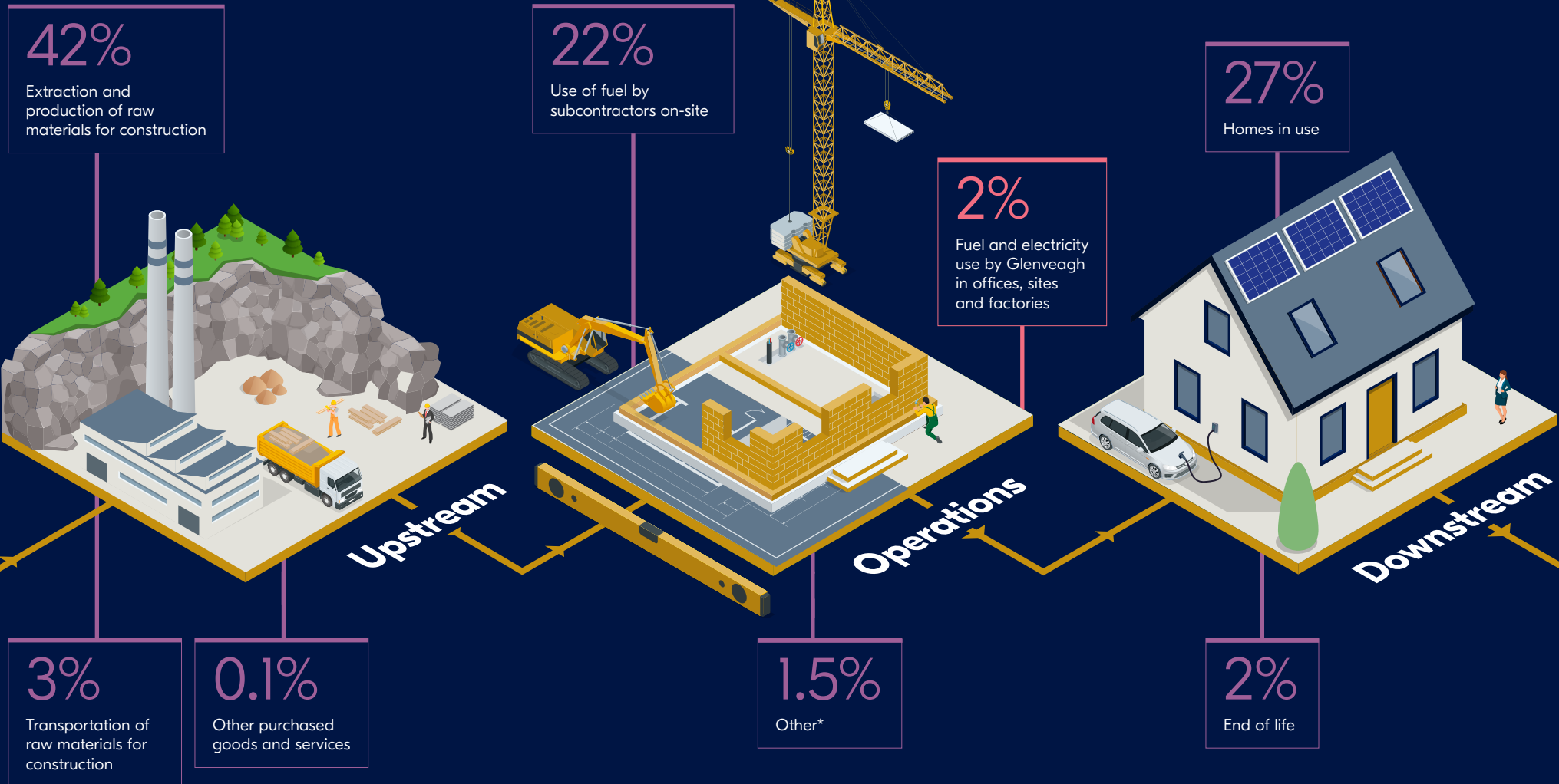
Our 2021 emissions

Colour Key

- Scopes 1 and 2
- Scope 3

*Includes losses relating to electricity and fuel consumption, business travel, employee commuting, assets and treatment of waste generated in operations.

See page 20 for a full breakdown of our GHG emissions.



OUR PLAN ON A PAGE

Now
→
 2050

Targets	Actions	Supported by
<p>46% absolute reduction in Scopes 1 and 2 by 2031*</p> <hr/> <p>Net Zero for Scopes 1 and 2 by 2050*</p>	<p>Scopes 1 and 2</p> <p style="font-size: 24px; font-weight: bold; text-align: center;">Transition sites to renewable fuel</p>	<p>Robust governance</p> <hr/> <p>Transparent reporting</p> <hr/> <p>Stakeholder engagement</p> <hr/> <p>Risk management</p>
<p>55% reduction in Scope 3 emissions intensity (tCO₂e/100sqm) by 2031*</p> <hr/> <p>Net Zero for Scope 3 by 2050*</p>	<p>Scope 3</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%; padding: 10px;"> <p style="font-size: 24px; font-weight: bold;">Supplier engagement</p> </div> <div style="width: 45%; padding: 10px;"> <p style="font-size: 24px; font-weight: bold;">Subcontractor engagement</p> </div> </div>	<p>Innovation</p> <hr/> <p>Raising awareness</p> <hr/> <p>Data quality</p>

Aligned to a 1.5°C trajectory

*Subject to validation

OUR TARGETS



Science-based targets

We understand the importance of setting targets that are aligned with the latest climate science and that will ultimately put us on a pathway aligned with the goals of the Paris Climate Agreement. We have developed both near-term GHG emissions reduction targets and long-term net zero GHG emissions targets for Scopes 1, 2 and 3. These targets have been developed in line with guidance from the Science Based Targets initiative ('SBTi') and have been submitted to the SBTi for validation.

Near-term carbon target

46%

absolute reduction in Scopes 1 and 2 by 2031*

55%

reduction in Scope 3 emissions intensity (tCO₂e/100sqm) by 2031*

*Subject to validation

Long-term carbon targets

Net Zero

in Scopes 1 and 2 by 2050*

Net Zero

in Scope 3 by 2050*

Business Ambition

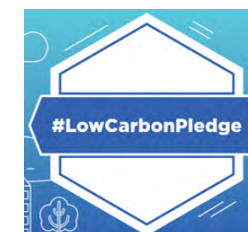
Glenveagh has responded to the SBTi's urgent call for corporate climate action by committing to align with 1.5°C and net zero through the Business Ambition for 1.5°C campaign.



Low Carbon Pledge

In 2022 Glenveagh signed up to Business in the Community Ireland's ('BITCI') Low Carbon Pledge.

The pledge commits all signatory companies to setting science-based carbon emissions reduction targets by 2024.



OUR STRATEGY

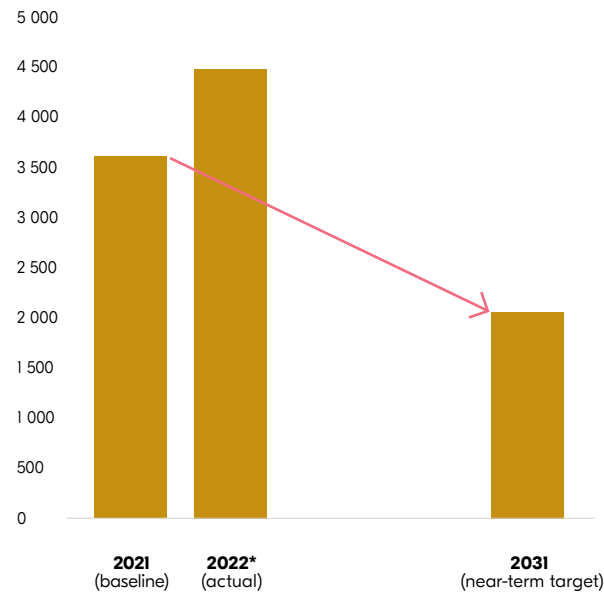
Actions to deliver targets

Scopes 1 and 2

Actions

- 01 Transition sites to renewable fuel
- 02 Transition fleet to EV
- 03 Renewable electricity
- 04 Electrification
- 05 Increase efficiency across sites, factories and offices

Scopes 1 and 2 near-term target (tCO₂e)



*Initial rise in emissions expected due to business growth.

Near-term carbon target

46%

absolute reduction in Scopes 1 and 2 by 2031*

Long-term carbon target

Net zero

in Scopes 1 and 2 by 2050*

*Subject to validation

OUR STRATEGY CONTINUED

Scopes 1 and 2 – Actions

01

Transition sites to renewable fuel

Fossil fuels for power generators and plant on site is the biggest source of Scope 1 emissions and is the area where we have the opportunity to make the most impact. We endeavour to transition construction sites from generators to the electrical grid, where feasible as quickly as possible and we will continue to work with utility providers to do this. In 2022, we trialled Hydrotreated Vegetable Oil (HVO) on two of our sites and will now roll this out across all of our sites replacing the need for diesel or gas oil. We see HVO primarily as a transition fuel and acknowledge the concerns that exist in relation to this. We will prepare a position paper to outline our approach to the use of HVO including our due diligence. In this context we will continue to research other options as they emerge, including hydrogen.

02

Transition fleet to EV

In 2021, we started to implement our strategy to move our fleet from diesel to EVs. As of February 2023, 18% of our fleet is electric. We will continue to add additional vehicles in line with lease renewals to achieve an electric fleet. EV charging infrastructure is available at our offices and has also been installed at relevant colleagues' homes. EV charging infrastructure across the country is facilitated using charge cards.



03

Renewable Electricity

We will assess the potential for the use of on-site renewables at our off-site manufacturing facilities in Dundalk, Carlow and Arklow.



04

Electrification

We have already commenced the electrification of machinery such as fork-lifts and pallet-lifting trucks in our manufacturing facilities. We will continue to do this where possible.

05

Increase efficiency across sites, factories and offices

In line with our ISO 14001 accredited Environmental Management System (EMS), we will continue to implement efficiencies across our sites, manufacturing facilities and offices to reduce the fuel and electricity required.

Outside of our emissions reductions strategies for Scope 2, we will also benefit from Ireland's Climate Action Plan which aims to see 70% renewables on the electricity grid by 2030. This will also benefit the occupants of our homes and our Scope 3 emissions.

OUR STRATEGY CONTINUED

Actions to deliver targets

Scope 3

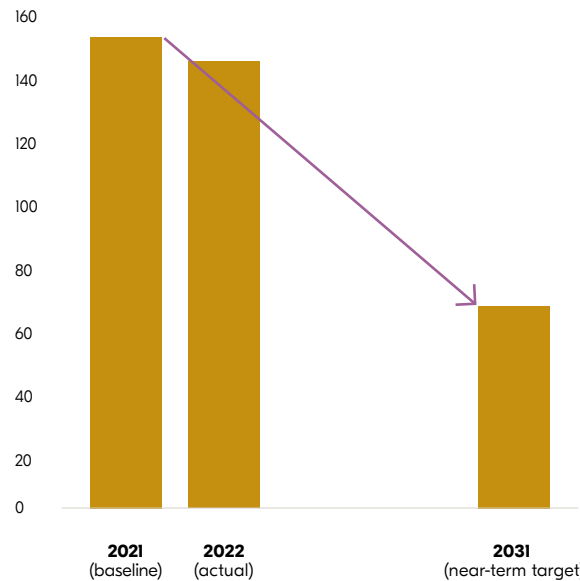
Actions

- 01 Supplier engagement
- 02 Subcontractor engagement
- 03 Innovation

Supporting actions

- 04 Raising awareness with customers and colleagues
- 05 Improving data quality and calculation methodology

Scope 3 near-term target (tCO₂e/100sqm)



Near-term carbon target

55%

reduction in Scope 3 emissions intensity (tCO₂e/100sqm) by 2031*

Long-term carbon target

Net zero

in Scope 3 by 2050*

*Subject to validation

OUR STRATEGY CONTINUED

Scope 3 – Actions

01

Supplier engagement

A large proportion of our Scope 3 emissions come from the extraction, production and transport of construction materials that we use to build our homes i.e. embodied carbon. For this reason, we know it is critical that we engage with our suppliers to bring them on the net zero journey with us. We commenced high-level engagement with our suppliers in 2021 and 2022 through surveys and meetings specifically around sustainability. In 2023, Glenveagh will develop a formal engagement plan for our suppliers.

This will include the following:

- Understanding current plans, actions and targets;
- Influencing suppliers to take increased action;
- Collecting relevant information to enable Glenveagh to make informed procurement decisions; and
- Bringing suppliers on the journey with us through knowledge exchange, training, etc.

We have always had a strong partnership with small local suppliers and we are committed to supporting them on the decarbonisation journey so that everybody has the opportunity to thrive. Throughout 2023 and 2024 we will engage with 80% of materials suppliers by value with respect to net zero.

Links to upstream emissions

02

Subcontractor engagement

Our subcontractors use significant amounts of fuel in the form of diesel and gas oil to carry out their work for us on our sites. In line with our own move towards renewable forms of fuel, we will work with our subcontractors to support their transition to less carbon intensive fuels. We will also work in partnership with them to implement efficiencies across our sites in line with our EMS.

Links to operations emissions

03

Innovation

Innovation is one of Glenveagh's core values and it is also reflected in our mission which is "to innovate how new homes are planned, designed, built and marketed in Ireland, and to make the journey for customers transparent, easy and joyful". In 2022, we set up an innovation team to further embed this approach throughout the organisation. A key element of this work will be delivering innovative solutions around design, manufacturing and construction to reduce the embodied carbon of Glenveagh homes. A research project is currently underway to assess the embodied carbon implications for a variety of options for all aspects of our homes.

Links to upstream, operations and downstream emissions

OUR STRATEGY CONTINUED

Scope 3 – Supporting actions

04

Raising awareness with customers and colleagues

We are committed to raising awareness of sustainable options with both our customers and colleagues. We already engage with our customers through our digital homeowner guides which include information on using their heat-pump system optimally, information on purchasing energy efficient equipment, energy saving tips and sustainable travel options in their locality.

We will build on this and look for innovative ways to support our customers further on their own sustainability journey.

We will also engage with our colleagues to ensure everyone can play their part in Glenveagh's net zero journey whether on site, in our manufacturing facilities or in our offices. Specifically, we identify roles where there is a need to further embed sustainability, and our approach to net zero and we will put in place development plans to meet these needs.



05

Improving data quality and calculation methodology

We will continue to explore ways to improve the quality of the data that we use to calculate our Scope 3 emissions as well as keeping up to date with the most recent methodologies as they evolve in this fast-moving space. Having disclosed our Scope 3 'purchased goods and services' emissions for 2021 using the approved quantis factors, we were conscious that the confidence in this data was quite low, especially given the impact of inflation on the price of materials. We knew that the majority of these emissions arose through our subcontractor use of fuel. Therefore, throughout 2022, our commercial team, with their extensive knowledge, worked to calculate the typical fuel use associated with various on-site processes and applied this across our portfolio of sites. This gave us a much increased data confidence rating. In addition, we applied the more recent and comprehensive US Environmentally-Extended Input-Output ('EIO') factors to the remaining 'purchased goods and services' categories which further increased the confidence levels.

We will also commence embodied carbon calculations on a project level, giving us a much clearer picture of the impact of different house and apartment types.



GOVERNANCE AND REPORTING

Governance

In line with our governance of the overall sustainability agenda, Glenveagh's Board has ultimate responsibility and oversight of the Net Zero Transition Plan.

It is supported in this by two Board committees namely the Environmental and Social Responsibility Committee ('ESR'), which is responsible for developing and monitoring our approach to sustainability (including climate change) and the Audit and Risk Committee ('ARC') which has responsibility with respect to climate risks and opportunities. The Executive Committee, led by the CEO, oversees sustainability at an executive level including the Net Zero Transition Plan. The Environmental Sustainability Working Group, comprising colleagues from across the Senior Leadership Team ('SLT'), is charged with ensuring its implementation. The sustainability team is responsible for day-to-day management of sustainability including the transition to net zero and supporting colleagues throughout the organisation to achieve our sustainability ambitions.



Reporting

Glenveagh is committed to transparently reporting our carbon emissions and our progress on the road to net zero.

We will continue to disclose our full GHG emissions through our annual report and these will be independently assured. We have also committed to reporting in line with TCFD and have been progressively improving our approach in this regard since we first reported in 2020.

We are actively preparing for the forthcoming European Sustainability Reporting Standards ('ESRS') under the EU's Corporate Sustainability Reporting Directive ('CSRD') which will see further requirements in the area of climate.

As part of our commitment to BITCI's Low Carbon Pledge we will report collectively through the annual Low Carbon Report.



Our annual report can be found [here](#).



We report annually to CDP and our submissions can be found [here](#).



Our carbon emissions methodology and our independent assurance can be found [here](#).



STAKEHOLDER ENGAGEMENT

We are conscious that to truly effect change we need to work collaboratively and bring others on the journey with us. We will use our influence within our industry, with broader business and academia, as well as with decision makers within government.

We already engage with several industry bodies and academic groups through memberships, working groups and committees. Shown opposite is a list of those most relevant to our transition to net zero. Participation in these allows us to keep up to date with evolving approaches and technologies, exchange knowledge with peers and use our influence as a leading business in Ireland to drive action. We will continue to review the organisations and groups with which we engage. We also engage with government on a variety of issues and through this plan, we will assess the areas where we can best advocate for change in support of our transition to net zero.

Irish Green Building Council Gold Member



A non-profit organisation with membership from across the value chain of the built environment with a common goal to accelerate the transformation of the built environment to one that is sustainable through leadership, research, education, and providing policy input to national and local government.

Business in the Community Ireland (BITCI) member



With over 110 of Ireland's leading organisations as members, Business in the Community Ireland is a movement inspiring and enabling business in Ireland to move towards a low carbon, socially inclusive, nature positive future where everyone thrives. The Low Carbon Pledge, of which Glenveagh is a signatory, is an initiative of BITCI's Leaders' Group on Sustainability.

Irish Institutional Property (IIP) ESG committee member



The mission of IIP is to promote the development of a sustainable world class real estate sector in Ireland which benefits members, the economy, communities and wider society. The purpose of the ESG committee is to provide a forum to facilitate the promotion and development of best practice ESG policies across member firms.

Build Digital Sustainability & Circularity Pillar Industry Advocate



The Build Digital Project aims to transform the Irish construction and built environment sectors by enabling all stakeholders, to develop, maintain, and continuously improve their capabilities as digitally enabled, standards-based, agile, collaborative, and sustainable participants in the delivery of Project Ireland 2040. This pillar will develop, pilot, and continuously improve a number of toolkits both for adaptation of their businesses directly and in support of their supply-chains. Industry members will play a critical role in ensuring the fitness-for-purpose of all developed tools.

Construct Innovate member



Construct Innovate, Ireland's construction technology centre, has a vision to make Ireland a global leader for sustainable construction and built environment technology. The centre is a partnership between Trinity College Dublin, University College Dublin, University College Cork, the Irish Green Building Council and the host institution, University of Galway.

Sustainable Futures Industry Partner



Sustainable Futures is focused on climate action, environmental sustainability, and achieving net zero in industry and enterprise. It aims to produce leaders who are equipped to lead the transition to a sustainable and net zero future. Funded by the Higher Education Authority's Human Capital Initiative, it is led by University College Cork in collaboration with Maynooth University, Atlantic Technological University and multiple industry partners.

CLIMATE-RELATED RISKS AND OPPORTUNITIES

Glenveagh's risk management framework is supplemented by a specific process to identify and assess climate-related risks and opportunities, which includes viewing risk over a longer timeframe than normal.

This Net Zero Transition Plan seeks to address these risks and opportunities and this plan will continue to evolve as new information becomes available. Scenario analysis will be carried out in 2023 to provide further understanding of our climate risks. Climate change has been identified as a principal risk for the Group indicating its priority within our overall strategy.

Process to identify climate-related risks and opportunities

Desk-based research including reviews of relevant climate change literature on impacts and risks, peer reviews and forthcoming regulatory requirements.

A long list of potential climate risks and opportunities were developed, reviewed and consolidated further.

Risks were individually scored using our standard risk scoring approach i.e. assessing impact and likelihood and the effectiveness of controls in place to come up with a residual score.

The risks and opportunities presented (in the appendix) are the output of this exercise and represent the highest ranked for transition and physical risks as well as opportunities.



Appendix



APPENDIX

Our emissions data

This data supports the Scope 1, 2 and 3 emissions data outlined on page 8.

Indicator	Measure	Unit	2022	2021	2020	
Climate – carbon emissions	100sqm of units completed	100sqm	1,563	1,255	875	
	Scope 1 – combustion of fuel	tCO ₂ e	3,567	3,048	2,700	
	Scope 2 – location based	tCO ₂ e	813	518	519	
	Scope 2 – market based	tCO ₂ e	227	189	247	
	Total Scopes 1 and 2 – location based	tCO ₂ e	4,380	3,566	3,219	
	Total Scopes 1 and 2 – market based	tCO ₂ e	3,794	3,237	2,947	
	Scopes 1 and 2 per 100sqm of completed units – location based	tCO ₂ e/100sqm	2.8	2.8	3.7	
	Scopes 1 and 2 per 100sqm of completed units – market based	tCO ₂ e/100sqm	2.4	2.6	3.4	
	Total Scope 3 GHG emissions	tCO ₂ e	223,332	188,618	128,645	
	Total Scopes 1, 2 and 3 – location based	tCO ₂ e	227,712	192,184	131,864	
	Total Scopes 1, 2 and 3 – market based	tCO ₂ e	227,126	191,854	131,592	
	Emissions per 100sqm completed homes – Scopes 1, 2 and 3 – location based	tCO ₂ e/100sqm	145.7	153.1	150.7	
	Emissions per 100sqm completed homes – Scopes 1, 2 and 3 – market based	tCO ₂ e/100sqm	145.3	152.8	150.4	
	Scope 3 emissions categories					
	Waste	tCO ₂ e	195	120	78	
	Business travel	tCO ₂ e	44	18	17	
Other fuel and energy	tCO ₂ e	1,119	894	1,077		
Upstream transportation and distribution	tCO ₂ e	7,143	6,442	4,715		
Employee commute	tCO ₂ e	1,093	908	879		
Capital goods – construction materials	tCO ₂ e	102,083	80,526	52,309		
Capital goods – assets	tCO ₂ e	678	769	176		
Purchased goods and services	tCO ₂ e	55,642	42,372	25,880		
Occupant energy use (over 50 yrs) – regulated	tCO ₂ e	17,637	24,855	22,539		
Occupant energy use (over 50 yrs) – unregulated	tCO ₂ e	30,888	26,770	17,639		
Occupant emissions – refrigerants	tCO ₂ e	1,388	1,085	508		
End-of-life treatment of product	tCO ₂ e	5,423	3,857	2,828		
Climate – energy efficiency	Fuel and electricity consumption from sites and offices	mWh	16,707	13,779	13,580	
	Operation energy intensity	mWh/100sqm	11	11	16	



Read more about our environmental performance on page 43-44 of the 2022 Annual Report.

APPENDIX CONTINUED

OUR RISKS AND OPPORTUNITIES

Risk/Opportunity	Risk Description	Potential Impact	Our Response
HIGHEST RATED TRANSITION RISKS			
SUPPLIERS PACE OF CHANGE AND NET ZERO ALIGNMENT Time frame: Medium-long term Materiality: High Risk type: Reputational, Technology, Market	Key suppliers of high carbon impact materials and works on-site don't move at a rate that is fast enough for us to align with our planned net zero journey with little or no alternative available.	Increased costs resulting from preferred suppliers' inability to scale or transition to meet our sustainability needs cost effectively.	<ul style="list-style-type: none"> – Supplier engagement programme – see. pg. 14. – Vertical integration of supply-chain and development of key manufacturing capabilities.
CARBON PRICING Time frame: Medium-term Materiality: High Risk type: Policy and Legal, Technology, Market, Reputation	Failure to move away from carbon intensive products/services at a fast enough pace while carbon taxes continue to rise.	Increased costs due to carbon taxes. Impairment in carrying value of carbon intensive assets (e.g. plant and machinery).	<ul style="list-style-type: none"> – Actions as outlined in this strategy to reduce our carbon emissions – see pgs. 11-15.
OFF-SITE MANUFACTURING AND MODERN METHODS OF CONSTRUCTION (MMC) Time frame: Medium-term Materiality: High Risk type: Technology	Failure to fully/quickly take advantage of off-site manufacturing and MMC to address net zero challenges.	Increased construction costs resulting from the continued reliance on skilled labour, time spent on-site and the absence of efficiency benefits from standardisation in build methodology.	<ul style="list-style-type: none"> – Innovation department established. – Vertical integration of supply-chain and development of key manufacturing capabilities.
DEVELOPMENT OF LOW CARBON TECHNOLOGY Time frame: Medium-long term Materiality: High Risk type: Technology, Market, Reputation	Lack of pace in the market developing adequate/appropriate low carbon technology combined with spike in the shift to low carbon technology or products leads to lack of supply, price rises and ultimately an inability to meet certain commitments and obligations.	Increased construction costs due to the lack of appropriate low carbon materials.	<ul style="list-style-type: none"> – Supplier engagement programme see pg. 14. – Sustainability and innovation teams established which will monitor developments in this area. – Vertical integration of supply-chain allows for greater control. – Our commitment to net zero provides a clear signal to the market.

APPENDIX CONTINUED

Risk/Opportunity	Risk Description	Potential Impact	Our Response
HIGHEST-RATED OPPORTUNITIES			
IMPACTS ON SUPPLY-CHAINS Time frame: Medium-term Materiality: High Risk type: Market	Supply-chain is impacted by disruption due to frequent severe weather events causing delays to deliveries and subsequent delays to our schedules. Suppliers themselves are restricted or impacted by transition risks affecting availability, cost of goods and services to us.	Increased construction costs resulting from disrupted construction programmes and availability of goods and services.	<ul style="list-style-type: none"> – Vertical integration of supply-chain and development of key manufacturing capabilities.
SEVERE WEATHER EVENTS Time frame: Short-term Materiality: Low Risk type: Acute physical	More frequent storms, extreme rainfall, flooding and other severe weather events result in sites being closed for longer periods of time at greater frequency, as well as potentially unsafe conditions for people on construction sites during extreme weather events e.g. storms and heatwave conditions.	Increased construction costs due to prolonged construction programmes resulting from severe weather related delays.	<ul style="list-style-type: none"> – Greater reliance on off-site construction will reduce the exposure to this risk. – Health and Safety systems and procedures are in place. Weather warnings are issued and safety procedures activated accordingly to severity of weather.
HIGHEST-RATED PHYSICAL RISKS			
A STANDARD SETTER IN THE INDUSTRY Time frame: Medium-term Materiality: Medium Opportunity type: Product	Become a standard setter in the industry driving suppliers and partners to come on the journey with us as their partner of choice, helping suppliers to become more competitive.	Decreased construction costs resulting from better bargaining position.	<ul style="list-style-type: none"> – Supplier engagement programme – see. Pg. 14 – Vertical integration of supply-chain and development of key manufacturing capabilities.
ALIGNMENT WITH GREEN MORTGAGES Time frame: Short-term Materiality: Medium Opportunity type: Product	Align product with consumer green finance opportunities to make Glenveagh the product of choice in the market.	<p>Increased revenue.</p> <p>Decrease in the cost or increase in the availability of capital.</p>	<ul style="list-style-type: none"> – 55% of Glenveagh homes have an A1 rating (see annual report for more detail). – Education campaign with customers regarding supports available including green finance opportunities.
SUSTAINABILITY FINANCING Time frame: Short-term Materiality: Medium Opportunity type: Markets	Avail of green financing options due to performance against targets.	Decrease in the cost or increase in the availability of capital.	<ul style="list-style-type: none"> – First sustainability-linked financing facility in 2023.





NET ZERO TRANSITION PLAN 2023

Appendix 13.1 Verified Photomontages





**3D DESIGN
BUREAU**

Creative & Technical 3D Solutions
Design | Planning | Marketing

Hollystown-Kilmartin Site 4

Verified Views and CGI
Applicant: Marina Quarter Ltd

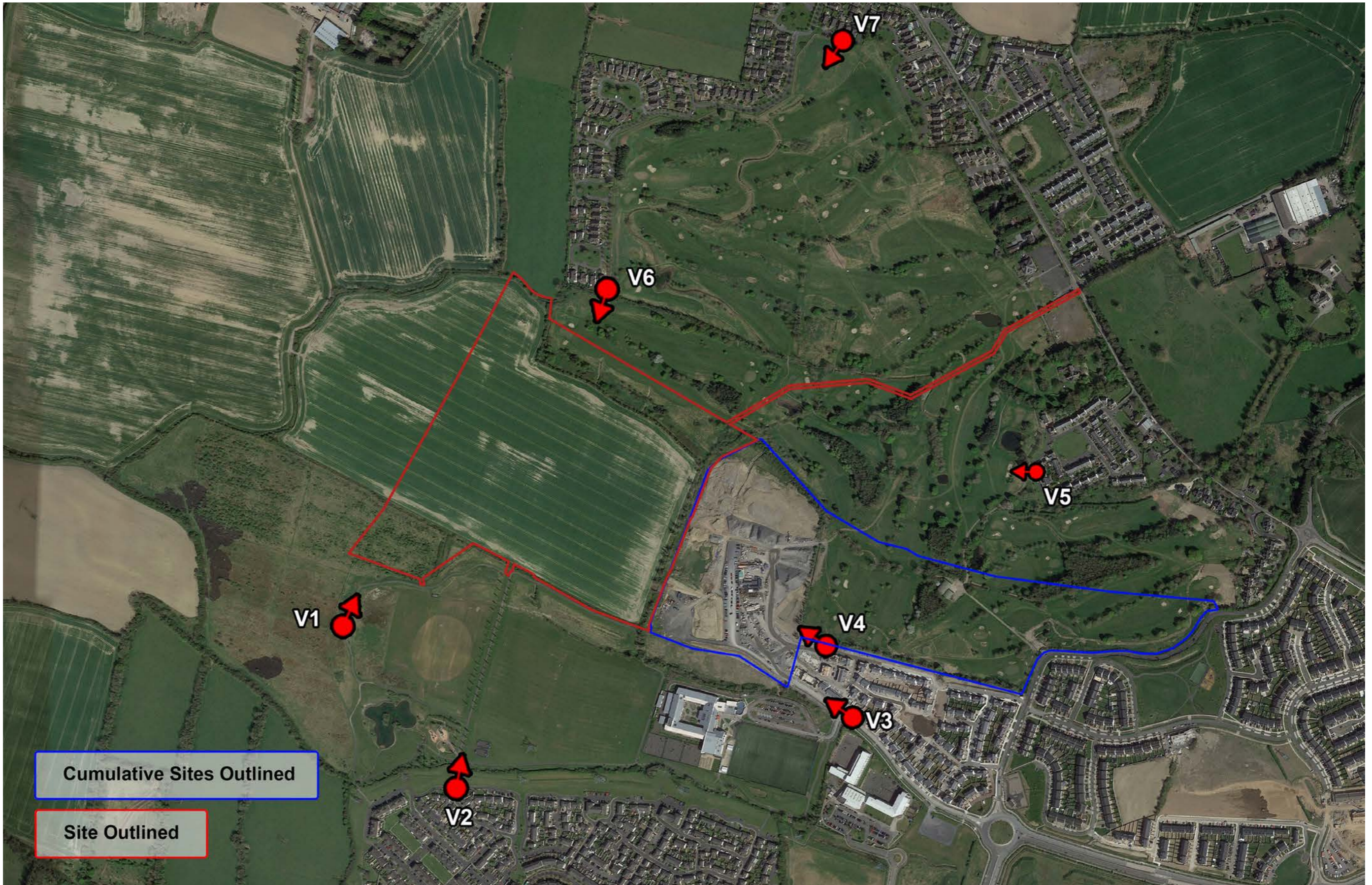
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August 2023



Project Title: Hollystown-Kilmartin Site 4

Applicant Name: Marina Quarter Ltd

Image Title: Viewpoint Location Map

CGI & VVMs by



Tel: 01 288 0186
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info@3ddesignbureau.com









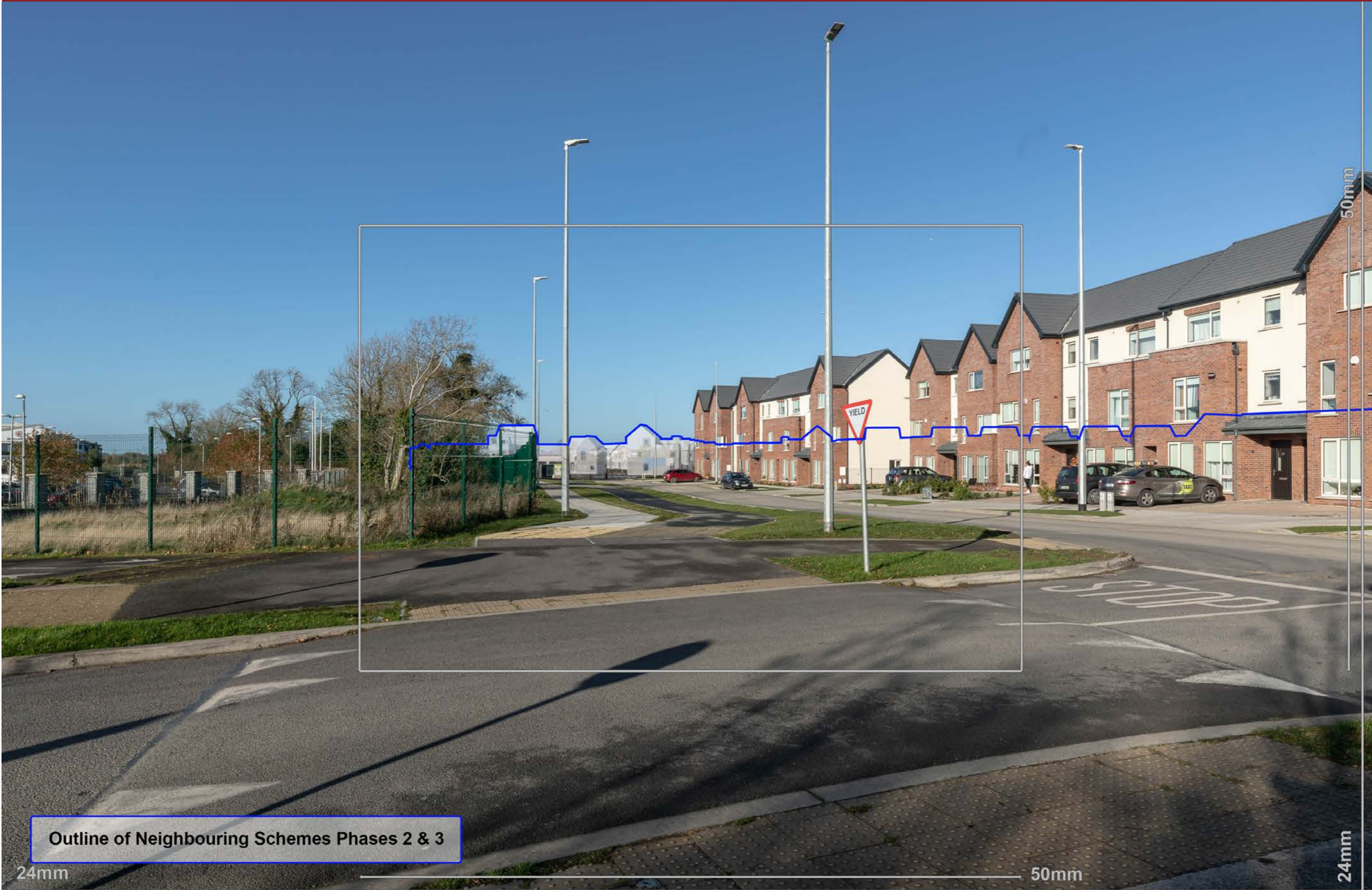




Outline of Neighbouring Schemes Phases 2 & 3







Outline of Neighbouring Schemes Phases 2 & 3







Outline of Neighbouring Schemes Phases 2 & 3

24mm

50mm

24mm





Outline of Proposed Development



Outline of Neighbouring Schemes Phases 2 & 3

Outline of Proposed Development













Outline of Neighbouring Schemes Phases 2 & 3

Outline of Proposed Development

24mm

50mm

24mm



**3D DESIGN
BUREAU**

APPENDIX

**Methodology
Verified Views Montages (VVM)**

Table Of Contents	Page
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1. Overview

This methodology has been prepared by 3D Design Bureau to explain the production of Verified View Montages (VVM). The preparation and presentation of reliable verifiable visual information is a key component to the writing of Landscape Visual Impact Assessment reports. It should be noted that VVMs are technical images and should be produced and used in a technically appropriate manner.

This booklet maybe accompanied by the inclusion of a number of CGIs from various viewpoint locations within the proposed site. These have been produced to give a better understanding of the design intent from a close range perspective. Whilst we have included soft landscaping that reflects the proposed design as close as possible, artistic license may have been used for certain planting and trees with regard to species, size and exact locations.

2. What Is A Verified View Montage

A Verified View Montage (VVM) is an accurate visual representation of the potential impact (or lack there of) that a proposed development may have on its surrounding environment when constructed. VVMs are produced using technical scientific verification methods, through the use of photography, surveying, 3D modelling, rendering and post-production.

Verified View Montages work by using the correct geospatial insertion of accurate and detailed digital 3D models in the existing landscape allowing for a photorealistic view of the planned development in its intended location.

The correct combination of all these fields of expertise will deliver a result in which we believe and trust to be accurate for official usage by the client for their intended purposes (ex. Planning applications, impact studies,...).

3.Methodology

3.1 Project Planning

Following appointment to the project, a desktop study is carried out with a full list of suggested views being drawn up for review prior to visiting the site. This is carried out between 3D Design Bureau, the client, and the planning consultant.

Note: If a LVIA report is being written by a third party (landscape architect or planning consultant), the medium to long range views will be guided by them. After obtaining a full list of viewpoint locations, it is reviewed, checked and a plan for the taking of baseline photographs is put in place.

Note: 3D modelling of the proposed scheme can, and usually is, commenced prior to the photographic site visit.

3.2 Data Capture: High Resolution Baseline Photography

Every baseline photograph is captured in raw settings using a high-resolution digital SLR camera. This allows for the maximum possible information to be retained in the digital file. It also avoids the file being altered by any internal camera processing definitions, which retains the maximum control and fidelity on the end results.

The focal lengths used depend on the surrounding context and proximity to the subject site. 3D Design Bureau use high quality lenses with focal lengths that allow for capturing enough surrounding context without compromising quality and fidelity, by avoiding excessive barrelling, distortion, or aberrations. All shots are taken horizontally with the use of a 50mm lens (where possible) and wider angle also.

Note: Although the 50mm focal length represents the perceived scale of the human eye, it does not represent the human field of view and therefore should not necessarily be used to show the proposed development in its context. Peripheral vision needs to be accounted for and whilst the 50mm lens option is recommended in the *British Landscape Institute Technical Guidance Note*, this does not take into account the dynamic movement of the human eye.

Furthermore, panoramic VVMs are described in the *British Landscape Institute Technical Guidance Note*. 3DDB do not produce these type of VVMs as they are made up of a series of individual VVMs stitched together. The stitching process is a non repeatable action which can result in different outputs of the same image each time. Therefore accuracy and verifiability can be called into question.

3.Methodology

3.2 Data Capture: High Resolution Baseline Photography (cont`d)

Each photo location is correctly recorded and marked as follows

On-Site:

The tripod location on site is paint marked and photographed in relation to existing elements. (Fig 1 below)

The location of each photo is manually marked on a printed map while on site.

The camera height is recorded.

In-Studio:

All photographs go through post processing back in the studio. The full set of photos along with a viewpoint location map (Fig 2 below) are issued to the client for review and to choose the best shots that will demonstrate the visual impact that the proposed scheme may/may not have. For each photo at each location, two focal lengths will be issued – the 50mm option and a wider field of view option. The most appropriate shot will be chosen depending on the surrounding context and location of the shot. See earlier section 3.2 for further explanation.



Fig.1: Camera Location marked and photographed.



Fig.2: Viewpoint location map post site visit.

3.Methodology

3.2 Data Capture: High Resolution Baseline Photography (cont`d)

Sample baseline photographs prior to selection and prior to marking up for surveying.



Fig.3: Baseline photo for view 5



Fig.4: Baseline photo for view 3



Fig.5: Baseline photo for view 4



Fig.6: Baseline photo for view 9

3.Methodology

3.3 Baseline Photo Surveying

When all baseline photos are chosen for the VVMs, each one is marked up in studio as per Fig 7 below. Fixed reference points within each photo, such as parapet heights, kerbing, lamp posts etc are coloured coded on the baseline photos. All 'marked up' baseline photos are then issued to our qualified topographical surveyor for surveying purposes.

The survey team records the camera/tripod position using GPS and Total Station to an accuracy of +/-1cm Northing and Easting and to an accuracy of +/- 2cm Elevation. The 'marked up' fixed reference points identified in each photo are then surveyed to establish exact orientation of the view and to verify the photomontage process. (Fig 8 below). This survey data is later modelled and included in the digital 3D model of the proposed development. (See section 3.4)



Fig.7: Fixed reference points marked for surveyour.



Fig.8: Fixed reference points surveyed and numbered by surveyor.

3.Methodology

3.4 3D Modelling & Visualisation

3D Modelling

An accurate digital 3D model of the 'proposed' development is produced using 3D software of choice. All of 3D Design Bureau's 3D modelling is carried out within AutoDesk's Revit. The digital 3D model is created from a combination of the third party architectural, engineering and landscape drawings. All proposed model information is contained in the one file and it is always positioned relative to the existing topographical site survey information supplied.

The 'marked up' fixed reference points (see section 3.3) which have been surveyed, are also modelled along with any other relevant survey information from the supplied topographical survey drawings. As stated above, the proposed 3D model and survey 3D model information are geospatially positioned relative to one another. This is imperative to ensure the accurate positioning and camera matching of the proposed digital 3D model within each chosen photo.

Visualisation

Once the digital 3D Revit model is complete, it is handed over to the 3D visualisation team for production. This stage of production involves matching of textures & finishes, lighting conditions and asset population for the proposed scheme. This ensures the accurate visual representation of the digital 3D model is as close as possible to the intended future 'As Built' development. Note: For accurate camera matching of the digital model to the baseline photography (which can take place prior to the visualisation process) please see Section 3.5. There are various 3D visualisation software's that are widely used for this stage of production. 3D Design Bureau use Autodesk 3D Studio Max as its main software for the visualisation process. This is accepted as the leading industry standard for architectural visualisation work and production of VVMs.

3.Methodology

3.4 3D Modelling & Visualisation

Fig.8: Digital 3D model including the fixed reference points

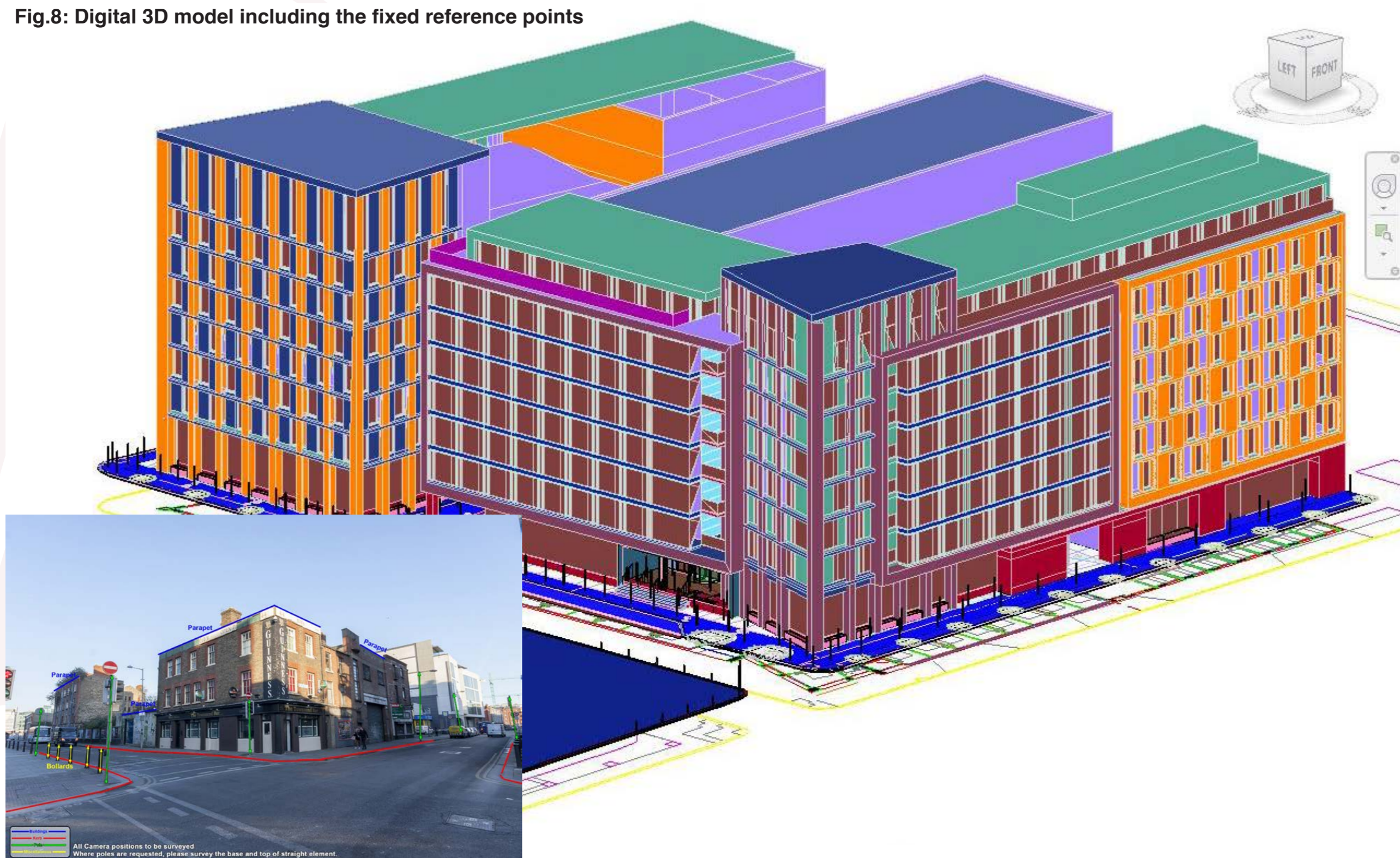


Fig.9: Fixed reference points surveyed and numbered by surveyor.

3.Methodology

3.5 Camera Matching / Rendering / Post Production

Following the completion of the 3D visualisation process, Section 3.4, (but in some instances prior to this) the following methodology is applied to ensure views are verifiable.

Camera Matching

All of the information recorded at the time of the baseline photographic site visit, that is, camera co-ordinates, angle of view, and direction of view, is programmed into the virtual camera within the 3D software package of choice - 3D Studio Max. Insertion of digital cameras within the software, with the matching attributes of the physical camera, is carried out. All elements of the photo survey, that have been surveyed and included in the digital model and geolocated relative to the proposed development are a key component to the camera matching process. This careful methodology ensures that the size, position, and height, of the proposed development in each VVM is correct to an accuracy of 0.33% i.e. +/- 1mm on an A3 print.

Rendering

Following the camera matching and 3D visualisation process the views are 'rendered' at high resolution and placed onto its matching baseline photograph using Adobe Photoshop software. The mathematical accuracy is then double checked and verified by ensuring that existing 'marked up' fixed reference p point features, which were also rendered, line up exactly in the baseline photo.

Post Production

Post production for all views is the last stage in the VVM process. The VVM specialist establishes which existing features such as buildings, landscape and trees, are in the foreground of the proposed development and those that are in the background, i.e. which features will mask the development and which ones will appear behind the development. When it is found that the development is not visible due to foreground features, its extremities will be indicated with a red outline. Furthermore on wide angle chosen views, the extent of 50mm lens is identified on the shot.

3.Methodology

3.5 Camera Matching / Rendering / Post Production



Fig.10: Fixed reference points for surveyor on Baseline untreated photo.

3.Methodology

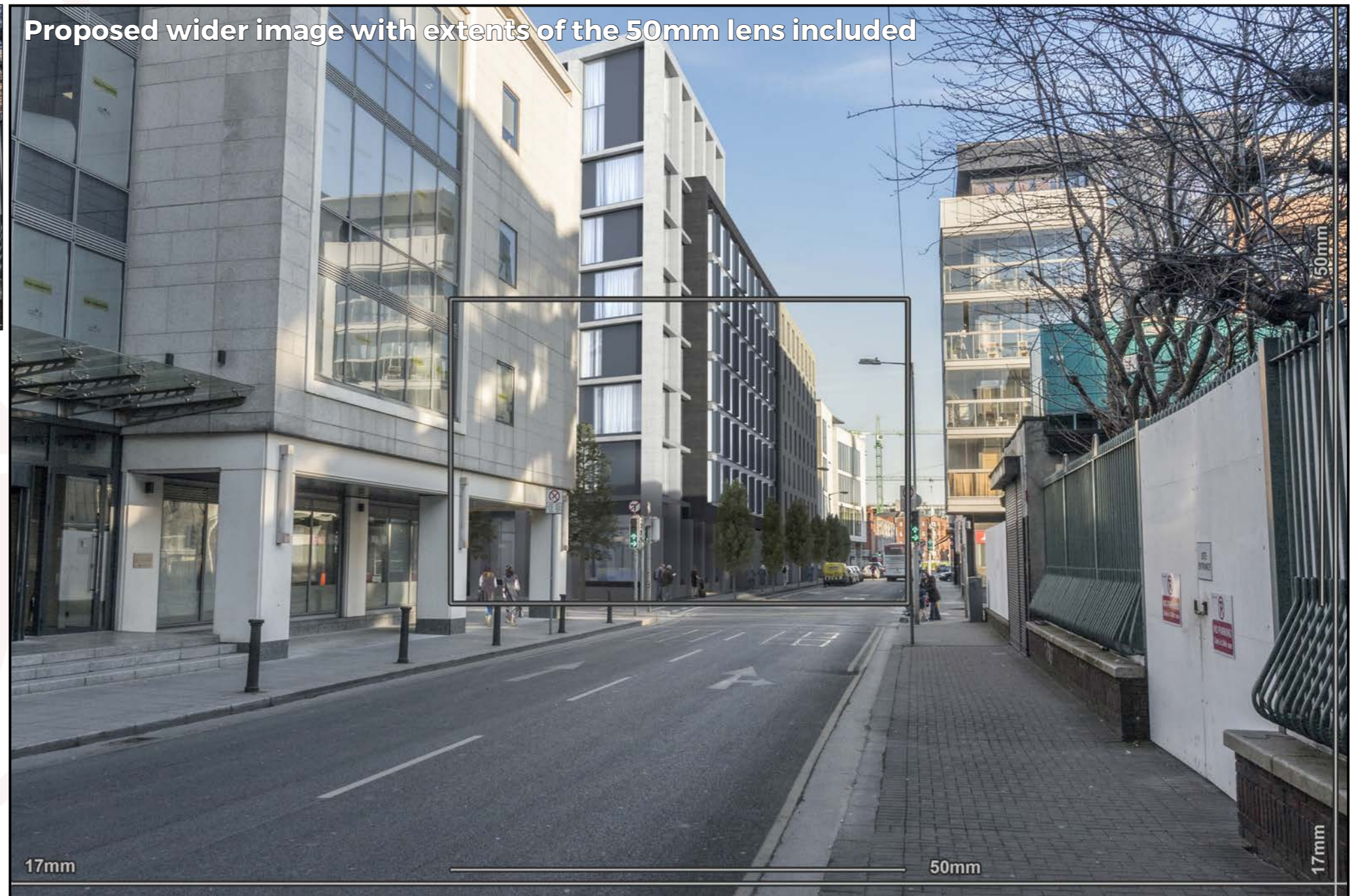
3.5 Camera Matching / Rendering / Post Production

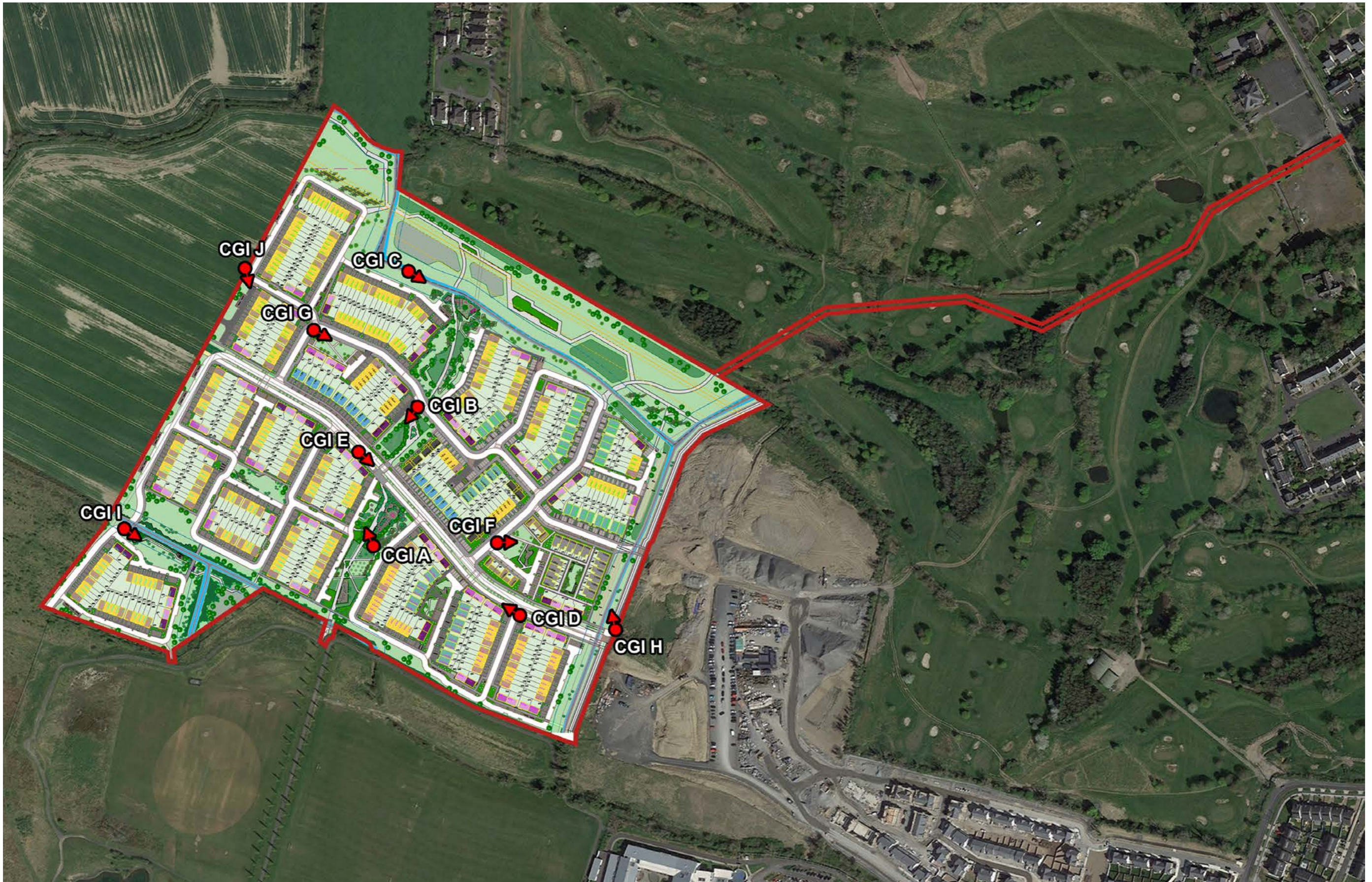


Fig.11: Fixed reference points modelled, rendered and overlaid on baseline photo confirming accuracy

4. Results

The resulting VVM, having gone through this extensive procedure, is classed as an accurate and verifiable representation of the proposed development as viewed from the selected photo locations. This shows, as closely as possible, any future impact a proposed development may have on the surrounding environment and existing buildings. It should be noted that the foundation of any Landscape/Townscape Visual Impact Assessment (LVIA / TVIA) report are accurate verified view montages.





Project Title: Hollystown-Kilmartin Site 4

Applicant Name: Marina Quarter Ltd

Image Title: CGI Location Map

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Applicant Name: Marina Quarter Ltd

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Project Title: Hollystown-Kilmartin Site 4

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Appendix 14.1 : Archaeological Testing Report



**ARCHAEOLOGICAL ASSESSMENT
AT
HOLLYSTOWN-KILMARTIN SITE 4,
COUNTY DUBLIN**

LICENCE NUMBER: 22E0215

ON BEHALF OF: MARINA QUARTER LIMITED

I.T.M.: 706895/743301

LICENCEE: FERGAL MURTAGH

REPORT STATUS: FINAL

AUGUST 2023

IAC PROJECT REF.: J3649

DOCUMENT CONTROL SHEET

DATE	DOCUMENT TITLE	REV.	PREPARED BY	REVIEWED BY	APPROVED BY
18.08.23	Archaeological Assessment at Hollystown-Kilmartin Site 4, Co. Dublin	0	F. Murtagh	T. Coughlan	F. Bailey

ABSTRACT

IAC Archaeology has prepared this report on behalf of Marina Quarter Ltd., to study the impact, if any, on the archaeological and historical resource of a proposed development, which is located at Kilmartin, Hollystown, Co. Dublin (ITM 706895/743301). The assessment was carried out by Fergal Murtagh under licence 22E0215.

There are five recorded archaeological sites within the lands of the development. The recorded sites within the proposed project boundary include a ring-ditch (DU013-038) and four enclosure features (DU013-032; DU013-036; -037 -039). No archaeological remains relating to any of these features were identified during the course of testing.

The recorded monuments were all originally identified via aerial photography and then the area was subject to a geophysical survey (Gimson 2011; Licence 11R0152) and subsequent archaeological test trenching (Kavanagh 2012; Licence 12E0063). The course of archaeological testing failed to uncover definitive features of archaeological significance, despite the identification of several areas of archaeological interest during the geophysical survey.

Due to the presence of the potential recorded monuments, further testing was carried out in 2022, where 41 trenches were excavated across the site footprint, equating to c. 3,377 linear metres. Testing revealed two areas of archaeological interest at the northwest and southwest of the site:

AA1: Potential C-shaped kiln or kiln flue with a total length of just over 9m, width 0.91m and 0.44m deep. A linear ditch/gully containing some animal bone running north–south was also identified here between 7–10m west of the possible kiln.

AA2: A C-shaped linear slot trench (C40.1) with a diameter of 7m was identified in the southwest of the site. A further area of intense was identified c. 14m to the northwest with five pit features and two spreads/deposits evident. Many of the features in this area contained animal bone and charcoal within their fills. Two linear ditches were also recorded in this area.

Four enclosures (RMP DU013-032, 036, 037, 039) and one ring-ditch (RMP DU013-038) are recorded as being located within the proposed development area. These sites were subject to archaeological testing in 2012 and again in 2022. No definitive archaeological remains relating to these monuments were identified during these programmes of investigation and as such it has been concluded that these monuments have been removed by intensive agricultural activity. No impacts are predicted on these monuments as a result of the development going ahead, as they are no longer extant.

Two small areas of archaeological potential were identified during testing in 2022. These comprise part of a possible kiln (AA1) and a C-shaped linear slot trench, five pit

features and two linear ditches (AA2). Prior to the application of any mitigation, ground disturbances associated with the construction of the development will result in a direct significant negative impact on these remains. These features will be preserved by record (archaeological excavation) prior to the commencement of the construction phase. This will be carried out under licence, as issued by the National Monuments Service of the DoHLGH. Full provision will be made available for the required works, both during field work and the post excavation analysis.

It is possible that small scale or isolated archaeological features survive within the proposed development area, outside of the footprint of the excavated test trenches. If present, ground disturbances associated with the construction phase would result in a direct negative impact on same. Impacts may range from moderate to significant negative, dependant on the nature, extent and significance of any remains that may be present. All topsoil stripping will be subject to archaeological monitoring, carried out by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of monitoring further archaeological mitigation may be required, such as preservation in situ or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

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1 INTRODUCTION

1.1 GENERAL

The following report details the results of a programme of archaeological testing undertaken at Hollystown-Kilmartin Site 4, Co. Dublin, prior to a proposed development (Figure 1; Plates 1–2). This assessment has been carried out to ascertain the potential impact of the proposed development on the archaeological resource that may exist within the proposed development area. The assessment was undertaken by Fergal Murtagh of IAC Archaeology (IAC), on behalf of Marina Quarter Ltd. and under Licence 22E0215, as issued by the National Monuments Service of the Department of Housing, Local Government and Heritage (DoHLGH).

Test trenching commenced at the site on the 5th of April and continued for seven days, to the 13th of April 2022. This was carried out using a 13 tonne 360 degree tracked excavator, with a flat, toothless bucket, under strict archaeological supervision. A total of 41 trenches were mechanically investigated across the test area, which measured 3,377 linear metres in total.

The route of a pipeline, associated with development to the east, was under construction at the time of testing (monitoring of topsoil associated with same was being carried out by another archaeological consultant). Pipeline works commenced after the submission of the licence application for the test trenching on the 11th of March 2022 (Plates 3 and 4), and as such it was not possible to excavate some of the proposed test trenches.

1.2 THE DEVELOPMENT

The proposed development will include for the development of 580 no. residential units, consisting of 112 no. apartments/duplexes and 468 no. houses ranging from 1 – 3 storeys and will also include for car parking, cycle parking, new pedestrian/ cycle links, storage, services and plant areas. Landscaping will include for high quality private open space, communal amenity areas and public open space provision (Figure 2).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 HISTORICAL & ARCHAEOLOGICAL BACKGROUND

The proposed site is located within a level agricultural field in the townlands of Kilmartin and Hollystown. There are five recorded archaeological sites located within the proposed development footprint, and two others located within c. 500m (Figure 1).

2.1.1 Prehistoric Period

Mesolithic Period (6000–4000 BC)

Although recent discoveries may provide evidence of a human presence in the southern half of Ireland from the Upper Palaeolithic (Dowd and Carden 2016), the Mesolithic period is the first time for which there is widespread evidence of human occupation across the island of Ireland. During the Mesolithic, small communities hunted, fished, and foraged. Coastal and riverine resources were of particular importance, with groups migrating to exploit seasonal resources. As a result of settlement evidence dating to the Mesolithic period is rare. Often the only trace of these communities are scatters of flint artefacts or the by-products of their manufacture. Occasionally, shell middens are also uncovered dating to this period; however, there are no sites dated to the Mesolithic in the vicinity of the proposed development site.

Neolithic Period (4000–2500 BC)

During the Neolithic period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. This transition was accompanied by major social change. Agriculture demanded an altering of the physical landscape. Forests were cleared and field boundaries constructed. There was a greater concern for territory, which saw the construction of large communal ritual monuments called megalithic tombs, which are characteristic of the period. There are no recorded sites of Neolithic date within the immediate vicinity of the proposed development site.

Bronze Age (2500–800 BC)

The Bronze Age in Ireland was marked by the use of metal for the first time. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. The tradition of megalithic tombs ended in the early Bronze Age in favour of individual, subterranean cist or pit burials that were either in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often, but not always, accompanied by a pottery vessel. Different forms of burial barrows were also being constructed during this period, as well as ceremonial monuments such as henges. Unenclosed cemeteries are also known from this period and are termed flat cemeteries.

In general, ring-ditches date to the Bronze Age, with the earlier examples being simpler in form and later examples incorporating entrances and a wider range of

burials practices. Ring-ditches appear to have continued to be built and earlier monuments re-used, during the Iron Age and early medieval period. A ring-ditch (DU013-038) is located on the western extent of the site, but it revealed no archaeological features of significance during geophysical and archaeological testing surveys.

A cluster of cremation pits was excavated c. 1.6km southeast of the development area in advance of the Tyrrelstown to N2 Cherryhound Interchange link road (DU013-043). Pit 1 held the remains of an older adolescent or adult. Similarly, Pit 2 also contained the remains of an older adolescent or adult. Pit 3 held a cremation placed within a coarse pottery vessel and was subsequently dated to 1010-840 cal. BC (Licence E003917). A further two cremation pits (DU013-044002/045002) and an annular ring-ditch dated to 1370–1110 BC (DU013-045001) were excavated as part of the scheme further to the east (Licence E003918).

Bronze Age activity is often clearly identifiable in the landscape by the presence of *fulachtaí fia* or burnt mounds. Thousands of *fulachtaí fia* have been recorded in Ireland making them the most common prehistoric monument in the country. These sites were used to heat water using hot stones. They have been interpreted as places where cooking, dyeing, brewing, or bathing took place (O' Kelly 1954, Quinn and Moore 2009). There are no identified examples in the immediate area of the proposed development.

Iron Age (800 BC–AD 500)

Compared to the rest of Irish prehistory, there is little evidence in Ireland, as a whole, representing the Iron Age. As in Europe, there are two phases of the Iron Age in Ireland; the Hallstatt and the La Tène. The Hallstatt period generally dates from 700BC onwards and spread rapidly from Austria, across Europe, and then into Ireland. The later Iron Age or La Tène also originated in Europe during the middle of the 5th century BC. For several centuries the La Tène Celts were the dominant people in Europe, until they were finally overcome by the Roman Empire. An oval kiln containing a single mixed deposit including charcoal identified as alder, hazel, ash, cherry/blackthorn, and willow/poplar was excavated and radiocarbon dated to the middle Iron Age, 160 BC-AD 50, c. 1.6km to the southeast (Licence E003918; DU013-044001).

2.1.2 Early Medieval Period (AD 500–1100)

Ireland, as depicted in the surviving sources, was entirely rural in the early medieval period. Ireland at this time was a patchwork of larger and smaller kingdoms known as *túath* and *trícha cét* respectively. Byrne (1973) estimates that there were as many as 150 kings in Ireland at the time, each ruling over a basic territorial unit known as the *túath*. If estimates placing the population of Ireland in the early medieval period at quarter to half a million people are accurate, then each king would have ruled over between 1,700 and 3,300 subjects within his *túath* (Stout 2017). From the 6th century, many of these subjects would have lived in enclosed settlements such as ringforts.

Secular habitation sites in the early medieval period include *crannógs*, cashels and ringforts, which are largely defined as circular enclosures surrounded by banks and ditches. In addition to these, there is some evidence for unenclosed settlements which are more difficult to identify in the archaeological record. The ringfort or *ráth* is considered to be the most common indicator of settlement during the early medieval period. Ringforts are strongly associated with agricultural land and, as such, are rarely situated at higher altitudes. Ringforts and potential ringforts are the most common archaeological sites recorded across the Irish landscape. Sites recorded as enclosures, in many cases, represent damaged or denuded ringforts or similar early medieval sites though some do date to prehistoric times. A number of enclosures (DU013-036/37/39) are located within the proposed development area but no direct archaeological evidence relating to same has been identified during this programme of testing.

During testing in 2012 a curved linear ditch measuring 4.45m wide by 0.45m deep was identified that may have been associated with enclosure DU013-037, but no other enclosing elements were identified. Testing at the site of enclosure DU013-039 located centrally within the site, failed to produce any evidence of archaeological remains. Enclosure (DU013-032), situated on the southern edge of the site revealed a shallow ditch at the approximate location in 2012 (1.5m wide by 0.4m deep). No archaeological remains were identified at the site of enclosure DU013-036 (Kavanagh, 2012; Licence 12E0063). No enclosing elements relating to any of the recorded sites were identified during the 2022 assessment, confirming that if these features were archaeological monuments, they have since been removed by intensive agriculture.

A corn-drying kiln (DU013-042) was excavated c. 1.6km southeast of the development site as part of the Tyrrelstown to N2 Cherryhound Interchange link road (Licence E003920). The kiln was dated to AD 1020–1180, placing it within the early medieval period and is evidence of agricultural activity in the wider environs of the site.

2.1.3 Medieval Period (AD 1100–1600)

The medieval period began with the arrival of the Anglo-Normans in Ireland in support of the deposed King of Leinster, Diarmait MacMurchadha. By the end of the 12th century the Normans had succeeded in conquering much of the country (Stout and Stout 1997). Leinster, including Dublin and Meath, was ‘sub-infeudated’, meaning that great swathes of land were parcelled out among the Anglo-Norman elites. The Anglo-Norman tenurial system more or less appropriated the older established land units known as *túaths* in the early medieval period but described the territories as manors (MacCotter 2008).

The medieval period is represented in the archaeological record by a site that was excavated c. 1.6km southeast of the proposed development area as part of the Tyrrelstown to N2 Cherryhound Interchange link road (DU013-046001; Licence E003919). Here two ditches and a number of pit features were recorded, which contained locally produced medieval pottery dating to the 13th and 14th centuries. There are no medieval sites within the study area of the proposed development area.

2.1.4 Post-Medieval Period (AD 1600–1800)

The 17th century witnessed the systematic reduction of all of Ireland to English authority, largely through conflicts and the forced settlements, 'The Plantations'. As part of the process of achieving colonial dominion a number of surveys and mapping programmes were completed throughout the post-medieval period. Simington's Civil Survey of 1654–56, was an inquisition that visited each barony (land division) and took depositions from landholders based on parish and townland, with written descriptions of their boundaries to facilitate the transfer of lands. Subsequent to the Civil Survey, a project known as the Down Survey 1656–58, used the collected cadastral information to map all forfeited lands. This survey was overseen by the surgeon-general of the English army, William Petty, and a number of former soldiers. It was not just a project of mapping but of social engineering that was underpinned by a massive transfer in landownership from Irish Catholics to English Protestants. This survey is the first ever detailed land survey on a national scale anywhere in the world and gives great insight in Ireland at this time; however, the townland of Hollystown was not depicted on this mapping. The townlands of 'Terellstowne' and 'Killmartin' are annotated to the south and west of the site respectively.

The 17th century also saw a dramatic rise in the establishment of large residential houses around the country. The large country house was only a small part of the overall estate of a large landowner and provided a base to manage often large areas of land that could be located nationwide. Lands associated with the large houses were generally turned over to formal gardens, which were much the style of continental Europe. By the mid-18th century more natural parkland landscapes were in favour although the creation of these required considerable effort, including moving earth, removal of field boundaries, culverting streams to form lakes and quite often roads were completely diverted to avoid travelling anywhere near the main house or across the estate.

2.2 SUMMARY OF PREVIOUS ARCHAEOLOGICAL FIELDWORK

A review of the Excavations Bulletin (1970–2023) has shown that two previous archaeological investigations have taken place within the current project footprint.

A geophysical survey was carried out in 2011 across the proposed development area, in order to attempt to locate five monuments identified through aerial photography in the 1980s (Gimson 2011; Licence 11R0152). The survey responses were not strong, but possible pits and two linear trends, possibly representing a relict field division in the field to the south, were identified. Additionally, a series of circular and oval trends indicative of enclosures and a ring-ditch (DU013-032/36-39) were identified in the field to the west, along with possible pits in an oval formation and two possible ditches (Figure 3).

After this course of geophysical survey, subsequent test excavation followed in 2012 (Kavanagh 2012; Licence 12E0063). A total of 25 test trenches were excavated across the site. A curved linear ditch measuring 4.45m wide by 0.45m deep was identified that may have been associated with enclosure DU013-037, but no other enclosing elements were identified. Testing at the site of enclosure DU013-039 located centrally

within the site, failed to produce any evidence of archaeological remains. Enclosure (DU013-032), situated on the southern edge of the site revealed a shallow ditch at the approximate location in 2012 (1.5m wide by 0.4m deep). No archaeological remains were identified at the site of enclosure DU013-036. The testing report in 2012 concluded that the lack of remaining evidence for the features is “likely due to the intensive and prolonged ploughing of the area for agricultural purposes since at least the post-medieval period”, or that’... the difference between the sub-surface remains and natural clay was negligible” (Kavanagh 2012, p. 23).

There have been no other previous excavations carried out within 500m of the proposed development area.

2.3 CARTOGRAPHIC ANALYSIS

William Petty, Down Survey Map of the Barony of Castleknock and the Parish of Mulhuddart, c. 1655

The proposed development area is located within the parish of ‘Mallahidert’. The townland of ‘Killmartin’ is annotated and Tyrrelstown House (DU013-006) is depicted to the north of the proposed development area. No other features of note are depicted within the project area on this map.

John Rocque, Map of County Dublin, 1760 (Figure 4)

This map shows the approximate location of the proposed development area in several fields with the label ‘Yellow Wall’ spanning the fields to the west of the site. Holly Wood House, comprising four structures, is annotated to the south of the proposed development, with a road leading to Kilmartin (northwest) bordering the southern site boundary. A lime kiln is annotated to the east of the site as well as an area labelled ‘The Torch’ and an unnamed structure is marked on the eastern side of a five-road junction (east of site).

John Taylor’s Map of the Environs of Dublin, 1816 (Figure 4)

The proposed development area is depicted in an undeveloped location on this map. A road leading to a cluster of three buildings, labelled ‘Hollywood Rath’ extends to the buildings from Hollywood Demesne; this may be the Holly Wood House depicted on Rocque’s (1760) map. A watercourse representing the Ward River traverses the landscape to the east and south of the proposed development area. There is no indication of the lime kiln shown on the previous mapping. ‘Yellow Walls’ is now depicted as being further west from the site location, at the intersection of three roads, with a cluster of buildings.

First Edition Ordnance Survey Map, 1843, scale 1:10560 (Figure 5)

This is the first accurate historic mapping coverage of the area containing the proposed development. The area is contained within the eastern extent of the Kilmartin townland boundary, with the eastern and northern boundaries bordered by the Hollystown townland. The majority of the site is divided between two large fields, with a field boundary (north-south oriented) bisecting the site. The southern

boundary of the proposed development area roughly follows a field boundary, with the southwest corner crossing into two other agricultural fields. Additionally, there is a road running along the southern boundary. A quarry, pond and 'Mound' site (DU013-003) are depicted north of the site, as well as Kilmartin House (c. 500m north) and demesne landscape (to the immediate northwest). No other features of significance are depicted on this map.

Second Edition Ordnance Survey Map, 1871, scale 1:10560

There are no major changes within the cartography of this map that relate to the proposed development area.

Ordnance Survey Map, 1906–9, scale 1:2,500 (Figure 5)

There have been minor changes to the field boundaries within the site by the time of this map, but the site remains situated within open agricultural fields. A field boundary now diagonally cuts across the southern point of the development, and a small portion of the southern edge is separately delineated, bordering the road.

2.4 AERIAL PHOTOGRAPHIC ANALYSIS

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995-2013), Google Earth (2002–2022) and Bing Maps (2022) has been carried out. The analysis shows that the site resides within largely undeveloped agricultural land. Coverage from 2012 (Google Earth 2012, March) shows the position of trenches from previous archaeological testing (Kavanagh 2012; Licence No. 12E0063). Coverage from 2022 (Google Earth 2022, March) shows groundworks associated with a pipeline that runs east-west through the development area, part of the recent development to the immediate east. Recent coverage (2017-2021) also indicates the presence of land drains across the field c. 10m apart. No previously unrecorded features of archaeological significance were identified from the available aerial photography and satellite imagery. None of the recorded monuments were visible as cropmarks within the more recent imagery.

2.5 TOPOGRAPHICAL FILES

Information on artefact finds from the study area in County Dublin has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area. There are no stray finds recorded in the proposed development area or within its immediate vicinity.

3 ARCHAEOLOGICAL TESTING

3.1 GENERAL

Test trenching took place from the 5th of April to the 13th of April 2022, using a 13 tonne 360 degree tracked excavator equipped with a flat, toothless bucket under strict archaeological supervision. Any investigated deposits were preserved by record. This was by means of written, drawn and photographic records.

A total of 41 test trenches were excavated across the site measuring 3,377 linear metres (Figures 6–11, Plates 5–30).

The test trenches were excavated to determine, as far as reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains threatened by the development. These are designed to reduce or offset the impact of the development scheme.

Trenches and archaeological contexts are described in detail in Appendix 1 and 2.

3.2 TESTING RESULTS

Topsoil comprised of a loosely compacted mid-brown silty clay with an average depth of 0.30m and an underlying plough soil layer consisting of a moderately compact orangey-brown clayey silt that varied in depth from 0.30m to 0.40m across the site. Natural subsoil also varied across the site. It generally consisted of mottled grey silty clay with orangey brown tendrils throughout.

Archaeological Features

Two Archaeological Areas (AA) were identified during the course of testing works. AA1 was located in Trench 18 in the north of the site and AA2 was located in Trench 40 in the southwest of the site.

AA1 consisted of a C-shaped linear gully (C18.1) that measured c. 9m in length, 0.91m in width and 0.44m. in depth. The diameter (distance between the two terminals) was c. 7m. The gully had two fills; a charcoal rich lining along the base and sides with a maximum depth of 0.18m (C18.3). The upper fill was a yellowish-brown sandy clay measuring 0.26m in depth (C18.2) (Figure 7; Plate 5). There was some evidence of possible *in-situ* burning at the western end of the gully. The dense charcoal deposit and the *in situ* burning may indicate that the gully represents the remnants of a kiln flue, although no defined kiln furnace or bowl was evident.

A north–south linear ditch/gully (C18.4) was identified 15m to the west of the possible kiln flue. It was 1.5m wide and 0.23m deep and was filled by a light yellowish-brown clayey silt with occasional stone and one fragment of animal bone (C18.5) it is not clear whether this feature is of archaeological significance.

AA2 consisted of a C-shaped or curvilinear slot trench (C40.1) that was 7m in diameter. The slot trench was 0.52m wide and 0.5m deep (Figure 7; Plate 6).

Extensions to Trench 40 revealed a cluster of features c. 14m to the northwest of the slot trench consisting of five pits, two linear ditches, two archaeological deposits/spreads, and four probable field drains. The average dimensions of the pits were 3m (l) by 1m (w) with an average depth of 0.35m (Plate 7). The linear ditches were 0.86m wide and 0.52m deep (C40.2) and 2.05m wide and 0.25m deep (C40.14).

Non-Archaeological Features

There are a large number of field drains that cross the proposed development area, these can be categorised into two main elements; earth cut drains filled with material similar to the local plough soil and earth cut drains that contained clay ceramic pipes. All field drains have a sharp break of slope at top and base with vertical sides and a flat base. The drains are visible within the aerial photographic coverage of the site.

A former field boundary was noted running north–south through Trenches 6, 7, 8 and 32 and can be seen to align with known field boundaries in Figure 8. Other possible field boundaries were noted in Trenches 1, 2, 32 and 35, these align with known field boundaries as seen in Figure 11.

3.3 CONCLUSIONS

There are five recorded archaeological sites within the lands of the development. The recorded sites within the proposed project boundary include a ring-ditch (DU013-038) and four enclosure features (DU013-032; DU013-036; -037 -039). No archaeological remains relating to any of these features were identified during the course of testing.

The recorded monuments were all originally identified via aerial photography and then the area was subject to a geophysical survey (Gimson 2011; Licence 11R0152) and subsequent archaeological test trenching (Kavanagh 2012; Licence 12E0063). The course of archaeological testing failed to uncover definitive features of archaeological significance, despite the identification of several areas of archaeological interest during the geophysical survey.

Due to the presence of the potential recorded monuments, further testing was carried out in 2022, where 41 trenches were excavated across the site footprint, equating to c. 3,377 linear metres. Testing revealed two areas of archaeological interest at the northwest and southwest of the site:

AA1: Potential C-shaped kiln or kiln flue with a total length of just over 9m, width 0.91m and 0.44m deep. A linear ditch/gully containing some animal bone running north–south was also identified here between 7–10m west of the possible kiln.

AA2: A C-shaped linear slot trench (C40.1) with a diameter of 7m was identified in the southwest of the site. A further area of intense was identified c. 14m to the northwest with five pit features and two spreads/deposits evident. Many of the features in this area contained animal bone and charcoal within their fills. Two linear ditches were also recorded in this area.

No evidence for RMP DU013-032 was found but the linear feature to the south that was identified by Kavanagh in 2012 was again identified in Trench 4 but not in Trench 3. Kavanagh's trench in 2012 was aligned north–south over the eastern enclosure, whilst Trench 3 and 4 from these testing works were on a similar alignment over the central enclosure, it is unlikely that this forms part of any potential RMP monument and is a drainage channel running east–west through a portion of the site. The southern portion of the geophysical anomaly targeted in Trench 3 were field drains (Figure 8; Plates 8–9).

The outer curvilinear anomalies noted from the geophysical survey for DU013-036 did not have any corresponding features within this phase of testing. The inner curvilinear anomaly did correspond with another large drainage channel running east–west that was identified in two Trenches 38 and 41. The aspect identified in Trench 38 is perfectly aligned with the geophysical anomaly but the portion in Trench 41, whilst in direct alignment with Trench 38, was not aligned with the geophysical anomaly (Figure 8; Plate 10–11).

No archaeological evidence was found in proximity to DU013-037, which should have been visible in Trench 19. Some of the numerous field drains in this trench align with the results of the geophysical survey but this may be coincidental due to the volume of field drains than anything else (Figure 9).

No archaeological evidence was found in proximity to DU013-038. This monument was targeted in Trenches 10 and 11, but the only elements of note here were stone built field drains (one if these partially aligned with the geophysical results (Figure 9).

A feature was recorded at the location of RMP DU013-039 in Trenches 21 and 22, but when investigated was identified as a drainage channel rather than an archaeological feature. This was further reinforced as the drainage channel was also evident in Trench 29, on the same alignment (Figure 10).

4 IMPACT ASSESSMENT AND MITIGATION STRATEGY

Impacts can be identified from detailed information about a project, the nature of the area affected, and the range of archaeological resources potentially affected. Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping; disturbance by vehicles working in unsuitable conditions; and burial of sites, limiting access for future archaeological investigation.

4.1 IMPACT ASSESSMENT

- Four enclosures (RMP DU013-032, 036, 037, 039) and one ring-ditch (RMP DU013-038) are recorded as being located within the proposed development area. These sites were subject to archaeological testing in 2012 and again in 2022. No definitive archaeological remains relating to these monuments were identified during these programmes of investigation and as such it has been concluded that these monuments have been removed by intensive agricultural activity. No impacts are predicted on these monuments as a result of the development going ahead, as they are no longer extant.
- Two small areas of archaeological potential were identified during testing in 2022. These comprise part of a possible kiln (AA1) and a C-shaped linear slot trench, five pit features and two linear ditches (AA2). Ground disturbances associated with the construction of the development will result in a direct significant negative impact on these remains.
- It is possible that small scale or isolated archaeological features survive within the proposed development area, outside of the footprint of the excavated test trenches. If present, ground disturbances associated with construction would result in a direct negative impact on same. Impacts may range from moderate to significant negative, dependant on the nature, extent and significance of any remains that may be present.

4.2 MITIGATION MEASURES

- AA1 and AA2, which comprise small areas of archaeological potential, will be preserved by record (archaeological excavation) prior to the commencement of the construction phase. This will be carried out under licence, as issued by the National Monuments Service of the DoHLGH. Full provision will be made available for the required works, both during field work and the post excavation analysis.
- All topsoil stripping will be subject to archaeological monitoring, carried out by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of monitoring further archaeological mitigation may be required, such as preservation in situ or by record. Any

further mitigation will require approval from the National Monuments Service of the DoHLGH.

It is the developer's responsibility to ensure full provision is made available for the resolution of any archaeological remains, both on site and during the post excavation process, should that be deemed the appropriate manner in which to proceed.

Please note that all recommendations are subject to approval by the National Monuments Service of the Heritage and Planning Division, Department of Housing, Local Government and Heritage.

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www.googleearth.com – Satellite imagery of the proposed development area.

www.bingmaps.com – Satellite imagery of the proposed development area.

APPENDICES

APPENDIX 1 TRENCH RESULTS

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
1	200	2	0.4	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted. Plate 12
2	200	2	0.52	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
3	40	2	0.6	North–south	No Archaeology found. Possible circular enclosure and linear trend were targeted from geophysics (DU013-032). Plate 9
4	40	2	0.6	North–south	No Archaeology found. A linear drainage channel running east–west. It measures 2m wide and 0.4m deep. Possible circular enclosure and linear trend were targeted from geophysics (DU013-032). Plate 8
5	30	2	0.55	West–east	No Archaeology found. Possible U-shaped anomaly, circular enclosure and a linear trend were targeted from geophysics. Plate 13
6	210	2	0.54	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
7	200	2	0.5	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
8	120	2	0.4	Northwest–southeast	No Archaeology found. A linear trend was targeted from the geophysics.
9	80	2	0.53	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
10	30	2	0.58	Northwest–southeast	No Archaeology found. Linear trends were targeted from the geophysics. Plate 14
11	80	2	0.48–0.7	East–west	No Archaeology found. Possible U-shaped anomaly, circular enclosure, a linear and circular trend were targeted from geophysics.
12	80	2	0.5	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
13	95	2	0.48–0.6	North–south	No Archaeology found. Possible pit cluster targeted at the northern end of trench (DU013-038).
14	95	2	0.48	Northeast–southwest	No Archaeology found. Possible pit cluster targeted at the north-eastern end of trench (DU013-038).
15	50	2	0.52	Northeast–southwest	No Archaeology found. Possible pit cluster targeted at the north-eastern end of trench.
16	60	2	0.5	North–south	No Archaeology found. Possible circular anomalies and a linear trend were targeted from geophysics.
17	50	2	0.6	Northeast–southwest	No Archaeology found. A circular geophysical anomaly was targeted at the northeast end of the trench.

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
18	140	2	0.52	Northwest-southeast	<p>A curvilinear shaped feature (C18.1) with a sharp break of slope at the top, steep sides and a gradual break of slope at the base with a flat to slightly concave base contained two fills C18.2 and C18.3. It measures c. 7m in length, 0.91m wide and 0.44m deep. The basal fill C18.3 is a charcoal rich lining along the base and sides of the feature measuring 0.18m thick along the base and 0.06–0.1m thick along the sides at the section. It is very soft with black silt and occasional heat affected sandstone inclusions. The upper fill, C18.2, was a yellowish-brown sandy clay fill with occasional small stone and fragments of animal bone present. It measures 0.26m in depth. Possibly <i>in-situ</i> burning at the western end of the feature (Plates 15–16). A field drain running northeast–southwest cuts through the western end of the feature also.</p> <p>A north–south running linear feature (C18.4) was also noted in this trench, with a sharp break of slope at the top gradually sloping sides and an imperceptible break of slope at the relatively flat base. It measures 1.5m wide and 0.23m deep. It is filled by C18.5, a light yellowish-brown clayey silt with occasional stone and one fragment of animal bone present (Plate 17).</p> <p>A linear trend was targeted from the geophysics.</p>
19	80	2	0.6	Northwest-southeast	No Archaeology found. A linear trend and possible circular enclosures were targeted from the geophysics (DU013-037).
20	80	2	0.5	Northwest-southeast	No Archaeology found. No geophysical anomalies targeted.
21	50	2	0.28	Northwest-southeast	A possible drainage channel C21.1 was recorded here in line with the targeted geophysics anomaly (DU013-039). C21.1 is curvilinear in plan with a sharp break of slope at top steep side at the east the base appeared to be flat but the water table was present here also. It measures c.2m in width and 0.64m deep. C21.1 is filled by C21.3 and C21.2 . The basal fill, C21.3 is a firmly compacted light grey clay with occasional orange mottling and small stone inclusions, rare charcoal flecks were also notes at 0.25m depth. This is c.2m in width and 0.4m deep. The upper fill C21.2 , is a loosely compacted mottled orange/grey silty clay with occasional small stones. Plate 18
22	32	2	0.55	North-northeast-south-southwest	An east–west running drainage channel C22.1 was noted in this trench. This drainage channel is in alignment with the C21.1 the drainage channel noted in Trench 21. A linear trend was targeted from the geophysics (Du013-039) Plate 19
23	60	2	0.5	Northwest-southeast	No Archaeology found. No geophysical anomalies targeted.

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
24	100	2	0.5	Northwest–southeast	No Archaeology found. Two possible circular enclosures were targeted from the geophysics.
25	200	2	0.5	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
26	100	2	0.52	Northeast–southwest	No Archaeology found. No geophysical anomalies targeted.
27	100	2	0.45	Northeast–southwest	No Archaeology found. No geophysical anomalies targeted. Plate 20
28	100	2	0.4–0.66	Northeast–southwest	No Archaeology found. No geophysical anomalies targeted.
29	120	2	0.5–0.85	North-northeast–south-southwest	Drainage channel C29.1 in line with C21.1 and C22.1 with similar fills and likely the same feature. No geophysical anomalies targeted. Plate 21
30	55	2	0.5	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
31	140	2	0.4–0.5	Northwest–southeast	No Archaeology found. A linear trend, circular anomaly and the eastern side of a possible circular enclosure were targeted from the geophysics.
32	31	2	0.48	Northeast–southwest	No Archaeology found but an old field boundary running northwest–southeast was identified. No geophysical anomalies targeted.
33	38	2	0.54	Northeast–southwest	No Archaeology found. No geophysical anomalies targeted.
34	34	2	0.48–0.62	North-northwest–south-southeast	No Archaeology found. No geophysical anomalies targeted.
35	51	2	0.41–0.65	Northwest–southeast	No Archaeology found. No geophysical anomalies targeted.
36	40	2	0.5	North–south	No Archaeology found. A cluster of circular anomalies were targeted at the southern end of the trench and an east–west running linear trend.
37	40	2	0.38	West–east	No Archaeology found. A cluster of circular anomalies were targeted at the western end of the trench and a northwest–southeast running linear trend which aligned with a slight change in the geology with a greater amount of decayed stone present here. Plate 22
38	46	2	0.6	Northeast–southwest	A possible drainage channel C38.1 aligned with a curvilinear trend targeted from geophysics. C38.1 is 1.3m wide and 0.27m deep, it has a sharp break of slope at top gradually sloping sides and a gradual break of slope at base. The base is relatively flat. It is filled by a pale brown clay (C38.2) with some snail shells at the base. C38.1 is in alignment with C41.1 and is likely the same feature. A second curvilinear trend was also targeted in this trench (DU013-036). Plate 23
39	41	2	0.5	Northwest–	No Archaeology found. A circular anomaly was

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
				southeast	targeted at the western end of the trench.
40	50	2	0.5–0.6	East–west	<p>A C-shaped curvilinear slot C40.1 was identified in the middle of the trench (Plate 6). It has a sharp break of slope at the top steep near vertical sides and a gradual break of slope leading to a concave base. The internal diameter of this slot is 7m whilst the slot itself is 0.52m wide and 0.5m deep. C40.1 is filled mid–dark grey clay with frequent charcoal and occasional animal bone present (C40.15). The trench was extended to the south to try and locate a return for the curvilinear and whilst features were found (C40.2 and C40.3) it is unlikely these represent a return of C40.1 (Plate 24).</p> <p>C40.2 is a linear ditch feature running east–west located south of C40.1 and has two fills. It measures 0.86m wide and 0.52m deep. The basal fill, C40.16, which also lines the sides, is composed of a soft dark charcoal rich clay with frequent animal bone. The upper fill, C40.17, is composed of a friable, mid-grey clay with frequent charcoal and animal bone (Plate 25).</p> <p>C40.3 is a linear drain roughly parallel to C40.2 located 0.1m further south. It measures 0.38m wide and 0.2m deep. The fill, C40.18, is composed of a firmly compacted, light greyish brown clay with flecks of charcoal and animal bone.</p> <p>C40.4 is a field drain running north–south and is filled (C40.19) with a soft dark grey clay with some animal bone present. It is 0.45m wide.</p> <p>C40.5 is a linear gully or drain measuring 0.7m wide and 0.35m deep. It has a sharp break of slope at top steep sides and a gradual break of slope at the relatively flat base. It is filled (C40.20) with a soft dark grey clay with occasional flecks of charcoal and frequent animal bone (Plate 26).</p> <p>C40.6 is a field drain running north–south and is filled (C40.21) with a soft dark grey clay with some animal bone present. It is 0.45m wide and 0.3m deep, very similar to C40.4.</p> <p>C40.7 is a sub rectangular pit with a sharp break of slope at top steep sides and a gradual break of slope at a concave base. It measures 3.1m long x 1.2m (exposed) wide and 0.35m deep. It has two fills, the basal fill, C40.22, consists of a very loose, dark grey clay with charcoal with rare flecks of burnt bone. The upper fill, C40.23, consists of a dark grey friable clay with frequent charcoal, animal bone and occasional medium sized stones with average diameter 0.1m (Plate 27).</p> <p>C40.8 is a large oblong pit with a sharp break of slope at the top, steep sides and a gradual break of slope at a concave base. It measures 3.4m long x 0.7m (exposed) wide and 0.4m deep. It is filled</p>

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
					<p>(C40.24) with a dark grey friable clay with frequent charcoal and animal bone. A cluster of charred seeds was also noted at 0.1m depth.</p> <p>C40.9 is another large pit with an uncertain relationship with pit C40.8. The fill (C40.25) of these pits (C40.8 & C40.9) have the same colour and consistency. It measures 3m (exposed) in length and 1.6m in width.</p> <p>C40.10 is a large oblong pit with a sharp break of slope at the top steep sides and a gradual break of slope at a concave base. It measures 2.5m in exposed length, 0.8m in width and 0.2m deep. It is filled (C40.26) by a loosely compacted dark grey clay that is charcoal rich and has animal bone present (Plate 29).</p> <p>C40.11 is a spread of material sub oval in shape and consists of a mid-grey clayey silt with occasional animal bone and flecks of charcoal present. It measures 1m in exposed length, 1.5m wide and 0.1m in depth.</p> <p>C40.12 is an oblong shaped spread of material mid-greyish brown in colour with flecks of charcoal and occasional small stones present. Possible in-situ burning also present at the southern end of the feature. It measures 1.5m in length, 0.5m in width and 0.08m deep. Is an oval shaped pit (Plate 30)</p> <p>C40.13 is an oval shaped pit sub circular in shape with a sharp break of slope at top gradually sloping sides and a gradual break of slope at a concave base. It measures 1.2m in length, 0.9m in width and 0.6m in depth. It is filled (C40.27) by a mid-greyish brown friable clay with occasional flecks of charcoal present.</p> <p>C40.14 is a linear ditch running east–west with a sharp break of slope at top sloping sides and a sharp break of slope at a flat base. It measures 2.05m in width and 0.25m deep. It is filled (C40.28) by a mid-greyish brown silty clay with occasional stone present.</p>
41	29	2	0.4	North–south	<p>A possible drainage channel C41.1 aligned with a curvilinear trend targeted from geophysics. C41.1 is 1m wide and 0.28m deep, it has a sharp break of slope at top gradually sloping sides and a gradual break of slope at base. The base is relatively flat. It is filled (C41.2) by a pale brown clay. C41.1 is aligned with C38.1 and is likely the same feature. No geophysical anomalies targeted.</p>

APPENDIX 2 CONTEXTS

CONTEXT NO.	TRENCH NO.	DESCRIPTION
C18.1	18	A C-shaped feature with a sharp break of slope at the top, steep sides and a gradual break of slope at the base with a flat to slightly concave base. It measures 0.91m wide and 0.44m deep.
C18.2	18	A yellowish-brown sandy clay fill with occasional small stone and fragments of animal bone present. It measures 0.26m in depth. Possibly in-situ burning at the western end of the feature. A field drain running northeast–southwest cuts through the western end of the feature also.
C18.3	18	A charcoal rich lining along the base and sides of the feature measuring 0.18m thick along the base and 0.06–0.1m thick along the sides at the section. It is very soft with black silt and occasional heat affected sandstone inclusions
C18.4	18	A north–south running linear feature, with a sharp break of slope at the top gradually sloping sides and an imperceptible break of slope at the relatively flat base. It measures 1.5m wide and 0.23m deep.
C18.5	18	a light yellowish-brown clayey silt with occasional stone and one fragment of animal bone present.
C21.1	21	Curvilinear in plan with a sharp break of slope at top, steep side at the east the base appeared to be flat but the water table was present here also. It measures c.2m in width and 0.64m deep.
C21.2	21	A loosely compacted mottled orange/grey silty clay with occasional small stones.
C21.3	21	A firmly compacted light grey clay with occasional orange mottling and small stone inclusions, rare charcoal flecks were also noted at 0.25m depth. This is c.2m in width and 0.4m deep.
C22.1	22	Sharp break of slope at top, steep sides the base is flat.
C22.2	22	A loosely compacted mottled orange/grey silty clay with occasional small stones.
C29.1	29	Sharp break of slope at top, steep sides the base is flat.
C29.2	29	A loosely compacted mottled orange/grey silty clay with occasional small stones.
C38.1	38	It has a sharp break of slope at top, gradually sloping sides and a gradual break of slope at base. The base is relatively flat.
C38.2	38	A pale brown clay with some snail shells at the base
C40.1	40	A curvilinear slot with a sharp break of slope at the top, steep near vertical sides and a gradual break of slope leading to a concave base. The diameter of this slot is 7m whilst the slot itself is 0.52m wide and 0.5m deep. Filled by C40.15
C40.2	40	An east-west linear ditch with a sharp break of slope at top, steep sloping sides and a gradual break of slope at a concave base. It measures 0.86m wide and 0.52m deep. Filled by C40.16 and C40.17
C40.3	40	A linear feature with a sharp break of slope top and bottom and a flat base. It measures 0.38m wide and 0.2m deep. Filled by C40.18
C40.4	40	A field drain running north–south with a sharp break of slope at top and bottom, steep sides and flat base. Filled by C40.19
C40.5	40	A linear gully or drain measuring 0.7m wide and 0.35m deep. It has a sharp break of slope at top steep sides and a gradual break of

CONTEXT NO.	TRENCH NO.	DESCRIPTION
		slope at the relatively flat base. Filled by C40.20
C40.6	40	A field drain running north–south with a sharp break of slope at top and bottom, steep sides and flat base. It is 0.45m wide and 0.3m deep. Filled by C40.21
C40.7	40	A sub rectangular pit with a sharp break of slope at top steep sides and a gradual break of slope at a concave base. It measures 3.1m long x 1.2m (exposed) wide and 0.35m deep. Filled by C40.22–23
C40.8	40	A large oblong pit with a sharp break of slope at the top, steep sides and a gradual break of slope at a concave base. It measures 3.4m long x 0.7m (exposed) wide and 0.4m deep. Filled by C40.24
C40.9	40	A large pit with an uncertain relationship with pit C40.8. The fill of these pits (C40.8 & C40.9) have the same colour and consistency. It measures 3m (exposed) in length and 1.6m in width. Filled by C25
C40.10	40	A large oblong pit with a sharp break of slope at the top, steep sides and a gradual break of slope at a concave base. It measures 2.5m in exposed length, 0.8m in width and 0.2m deep. Filled by C40.26
C40.11	40	A spread of material sub oval in shape and consists of a mid-grey clayey silt with occasional animal bone and flecks of charcoal present. It measures 1m in exposed length, 1.5m wide and 0.1m in depth.
C40.12	40	An oblong shaped spread of material mid-greyish brown in colour with flecks of charcoal and occasional small stones present. Possible in-situ burning also present at the southern end of the feature. It measures 1.5m in length, 0.5m in width and 0.08m deep.
C40.13	40	An oval shaped pit, sub circular in shape with a sharp break of slope at top gradually sloping sides and a gradual break of slope at a concave base. It measures 1.2m in length, 0.9m in width and 0.6m in depth. Filled by C40.27
C40.14	40	A linear ditch running east–west with a sharp break of slope at top sloping sides and a sharp break of slope at a flat base. It measures 2.05m in width and 0.25m deep. Filled by C40.28
C40.15	40	Moderately compact, mid–dark grey clay with frequent charcoal and occasional animal bone present. Fill of C40.1
C40.16	40	The basal fill of C40.2, which also lines the sides, is composed of a soft dark charcoal rich clay with frequent animal bone.
C40.17	40	The upper fill of C40.2 is composed of a friable, mid-grey clay with frequent charcoal and animal bone.
C40.18	40	A firmly compacted, light greyish brown clay with flecks of charcoal and animal bone. Fill of C40.3
C40.19	40	and is filled with a soft dark grey clay with some animal bone present. It is 0.45m wide. Fill of C40.4
C40.20	40	A soft dark grey clay with occasional flecks of charcoal and frequent animal bone. Fill of C40.5
C40.21	40	A soft dark grey clay with some animal bone present. Fill of C40.6
C40.22	40	Basal fill consists of a very loose, dark grey clay with charcoal with rare flecks of burnt bone. Fill of C40.7
C40.23	40	Upper fill consists of a dark grey friable clay with frequent charcoal, animal bone and occasional medium sized stones with average diameter 0.1m. Fill of C40.7
C40.24	40	A dark grey friable clay with frequent charcoal and animal bone. A

CONTEXT NO.	TRENCH NO.	DESCRIPTION
		cluster of charred seeds was also noted at 0.1m depth. Fill of C40.8
C40.25	40	A dark grey friable clay with frequent charcoal and animal bone. Fill of C40.9
C40.26	40	A loosely compacted dark grey clay that is charcoal rich and has animal bone present. Fill of C40.10
C40.27	40	A mid-greyish brown friable clay with occasional flecks of charcoal present. Fill of C40.13
C40.28	40	A mid-greyish brown silty clay with occasional stone present. Fill of C40.14
C41.1	41	A possible drainage channel measuring 1m wide and 0.28m deep, it has a sharp break of slope at top gradually sloping sides and a gradual break of slope at base. The base is relatively flat.
C41.2	41	A pale brown clay.

APPENDIX 3 RMP SITES WITHIN THE SURROUNDING AREA

SMR NO.	DU013-032
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
I.T.M.	706838,743183
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	0m
DESCRIPTION	An aerial photograph taken by in the 1980s (Dr Gillian Barrett) shows a series of cropmarks representing at least three enclosures (av. diam. c. 60-70m). Portion of an outer enclosing element is visible at the most western site. Not visible at ground level. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063) which identified a linear feature (1.5m wide x 0.4m deep) that mirrored the line of the southern side of the enclosure and may form part of this monument (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-038
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706871,743411
CLASSIFICATION	Ring-ditch
DIST. FROM DEVELOPMENT	0m
DESCRIPTION	Aerial photograph (GB89. AE.12) shows cropmark of a ring-ditch. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063). No features of archaeological significance were noted but the water table is quite high in this area (Kavanagh 2012, 24)
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-037
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707004,743376
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	0m

DESCRIPTION	Aerial photograph (GB89. AE.12) shows cropmark of a curvilinear enclosure defined by a fosse. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063) which identified a curved linear ditch (1.45m wide, 0.45m deep) (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-039
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707050,743231
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	0m
DESCRIPTION	Aerial photograph (GB89. AF.03) shows cropmark of a curvilinear enclosure. The site was subject to geophysical survey (Licence no. 11R0152) which a number of isolated anomalies at the location of the monument but subsequent test excavation (Licence no. 12E0063) failed to identify any archaeological remains (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-036
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706773,743116
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	0m
DESCRIPTION	Aerial photographs (GB89. AF.05 & GB89. AE.07) show cropmark of a circular enclosure defined by a fosse and with a small contiguous cellular enclosure on its southern edge. This inner enclosure is surrounded by a widely spaced outer concentric fosse; a curved fosse extends from the outer enclosure suggesting the existence of a contiguous enclosure to the south-east. The site was subject to geophysical survey (Licence no. 11R0152) which detected linear features that mirrored the location of the monument but subsequent test excavation (Licence no. 12E0063) failed to identify the features conclusively (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-003
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RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706871,743731
CLASSIFICATION	Earthwork
DIST. FROM DEVELOPMENT	330m northwest
DESCRIPTION	The OS 1837 map edition shows an elongated earthwork marked 'mound' (est. dims. L 15m, Wth.10m). This site is located in lowland tillage. Not visible at ground level.
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-004
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Hollystown
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707484,743474
CLASSIFICATION	Earthwork
DIST. FROM DEVELOPMENT	381m north
DESCRIPTION	An aerial photograph taken in 1971 (FSI 1971/470/69) shows a roughly circular earthwork (diam.65m) on a natural rise in lands that have been incorporated into a golf course. There is no visible trace of this earthwork.
REFERENCE	www.archaeology.ie/ SMR file

APPENDIX 4 LEGISLATION PROTECTING THE ARCHAEOLOGICAL RESOURCE

PROTECTION OF CULTURAL HERITAGE

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

THE ARCHAEOLOGICAL RESOURCE

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act 1997* are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described 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’ (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

OWNERSHIP AND GUARDIANSHIP OF NATIONAL MONUMENTS

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

REGISTER OF HISTORIC MONUMENTS

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months’ notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

PRESERVATION ORDERS AND TEMPORARY PRESERVATION ORDERS

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six

months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

RECORD OF MONUMENTS AND PLACES

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for Housing, Local Government and Heritage) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that ‘where the owner or occupier (other than the Minister for Housing, Local Government and Heritage) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Housing, Local Government and Heritage to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice’.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989*, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document’s recommendations are typically incorporated into the conditions under which the development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

THE PLANNING AND DEVELOPMENT ACT, AS AMMENDED

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

Fingal County Development Plan, 2023–2029

Policy HCAP2 – Importance of Archaeological Resource

Recognise the importance of our archaeological resource and provide appropriate objectives to ensure its appropriate retention, promotion and recording.

Policy HCAP3 – Record of Monuments and Places/ Sites and Monuments Record

Safeguard archaeological sites, monuments, objects and their settings listed in the Record of Monuments and Places (RMP), Sites and Monuments Record (SMR), underwater cultural heritage including protected wrecks and any additional newly discovered archaeological remains.

Policy HCAP4 – Preservation-in-situ

Favour the preservation in-situ (or at a minimum preservation by record) of all sites and features of historical and archaeological interest.

Objective HCAO1 – Preservation-in-situ

Favour the preservation in situ or at a minimum preservation by record, of archaeological sites, monuments, features or objects in their settings. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service of the Department of the Housing, Local Government and Heritage.

Objective HCAO2 – Protection of RMPs/SMRs

Protect all archaeological sites and monuments, underwater archaeology, and archaeological objects, which are listed in the Record of Monuments and Places, Wreck Inventory of Ireland and all sites and features of archaeological and historic interest discovered subsequent to the publication of the Record of Monuments and Places, and to seek their preservation in situ (or at a minimum, preservation by record) through the planning process.

Objective HCAO3 – Management of Archaeological Resource

Encourage and promote the appropriate management and maintenance of the County's archaeological heritage, including historical burial grounds and underwater cultural heritage in accordance with conservation principles and best practice guidelines.

Objective HCAO4 – Industrial or Military Heritage

Secure the preservation in-situ of significant examples of industrial or military heritage.

Objective HCAO5 – Community Monuments Fund

Support the implementation of the Community Monuments Fund in order to ensure the monitoring and adaptation of archaeological monuments and mitigate against damage caused by climate change.

Objective HCAO6 – Climate Change and the Archaeological Resource

Co-operate with other agencies in the investigation of climate change on archaeological sites and monuments and to develop suitable adaptation measures to strengthen resilience and reduce the vulnerability of archaeological heritage in line with the National Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage 2019.

Policy HCAP5 – Development Design

Incorporate heritage features into infrastructure design at an early stage in the development planning and management process to protect and promote the cultural heritage resource and create awareness and interpretation.

Objective HCAO7 – Archaeology and Development Design

Ensure archaeological remains are identified and fully considered at the very earliest stages of the development process, that schemes are designed to avoid impacting on the archaeological heritage.

Objective HCAO8 – Archaeological Impact Assessment

Require that proposals for linear development over one kilometre in length; proposals for development involving ground clearance of more than half a hectare; or developments in proximity to areas with a density of known archaeological monuments and history of discovery; to include an Archaeological Impact Assessment and refer such applications to the relevant Prescribed Bodies.

Objective HCAO9 – Archaeology in the Landscape

Ensure that in general development will not be permitted which would result in the removal of archaeological monuments with above ground features, protected wrecks and that this will be especially the case in relation to archaeological monuments which form significant features in the landscape.

Objective HCAO10 – Context of Archaeological Monuments

Ensure that development within the vicinity of a Recorded Monument or Zone of Archaeological Notification does not seriously detract from the setting of the feature and is sited and designed appropriately.

Objective HCAO11 – Impacts of large-scale development

Ensure that proposals for large scale developments and infrastructure projects consider the impacts on the archaeological heritage and seek to avoid them.

Objective HCAO12 – Coastal and Maritime Heritage

Co-operate with other agencies in the assessment of the potential for climate change to impact on coastal, riverine, inter-tidal and sub-tidal sites and their environments including shipwreck sites.

Objective HCAO13 – Findings of Archaeological Activity

Encourage reference to or incorporation of significant archaeological finds into development schemes, where appropriate and sensitively designed, through layout,

in situ and virtual presentation of archaeological finds and by using historic place names and the Irish language where appropriate.

Objective HCAO14 – Archaeology in Open Space

Retain and manage appropriately archaeological monuments within open space areas in or beside developments, ensuring that such monuments are subject to an appropriate conservation management plan, are presented appropriately and are not left vulnerable, whether in the immediate or longer term, to dangers to their physical integrity or possibility of loss of amenity.

APPENDIX 5 IMPACT ASSESSMENT & THE CULTURAL HERITAGE RESOURCE

POTENTIAL IMPACTS ON ARCHAEOLOGICAL AND HISTORICAL REMAINS

Impacts are defined as ‘the degree of change in an environment resulting from a development’ (Environmental Protection Agency 2022). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected, and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

PREDICTED IMPACTS

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialists.

APPENDIX 6 MITIGATION MEASURES & THE CULTURAL HERITAGE RESOURCE

POTENTIAL MITIGATION STRATEGIES FOR CULTURAL HERITAGE REMAINS

Mitigation is defined as features of the design or other measures of the development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ*.

DEFINITION OF MITIGATION STRATEGIES

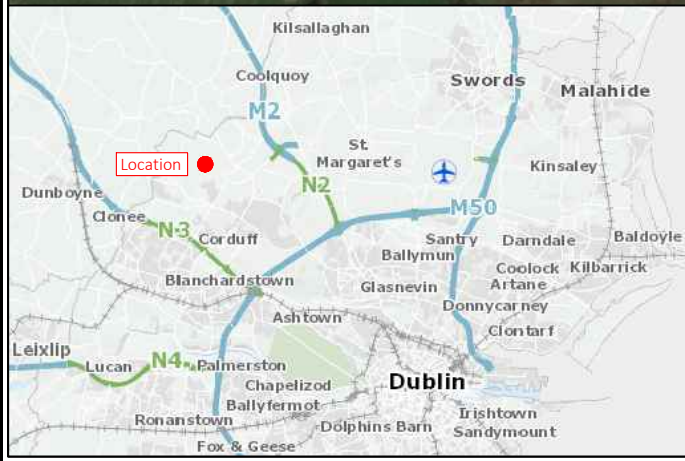
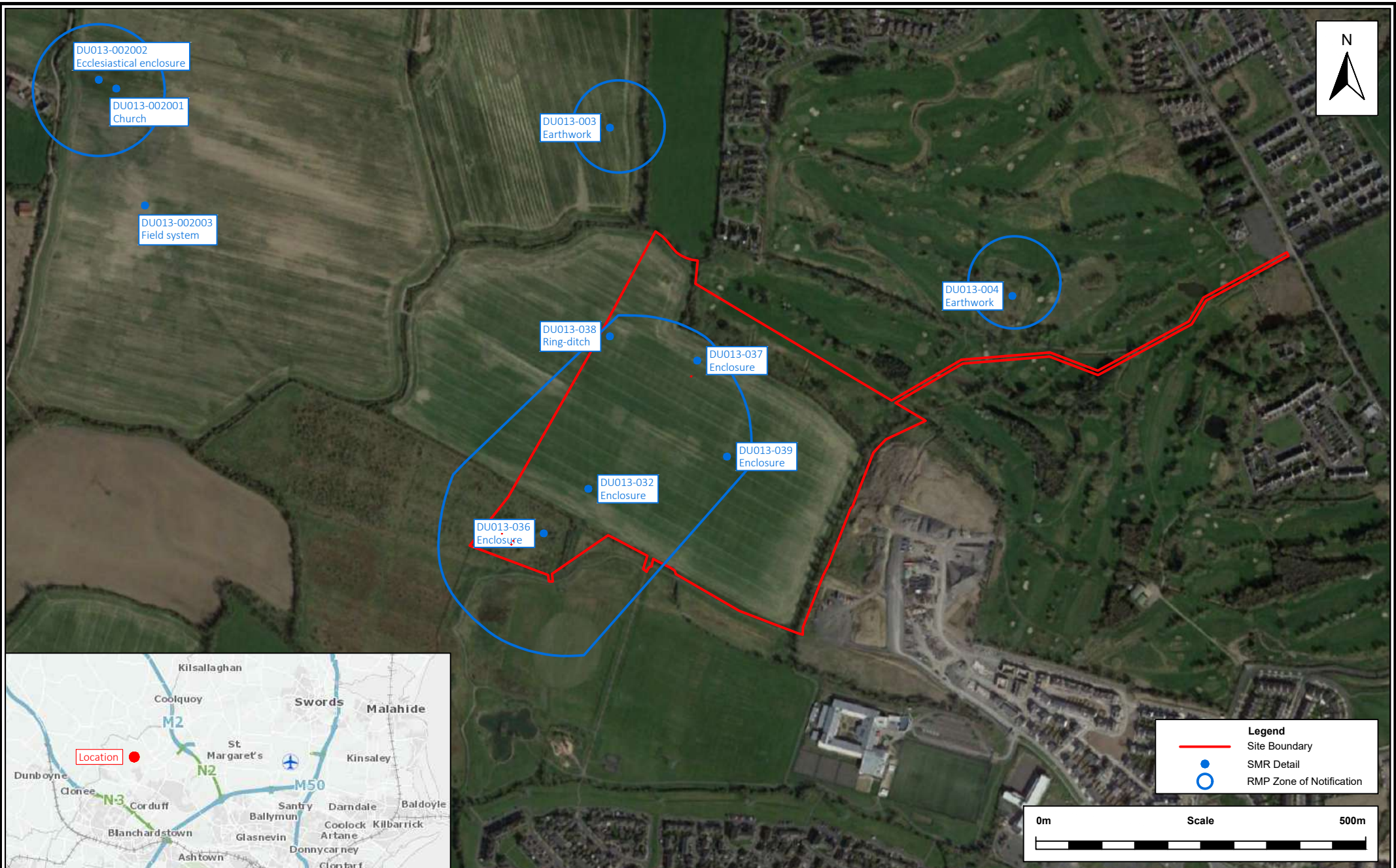
ARCHAEOLOGICAL RESOURCE

The ideal mitigation for all archaeological sites is preservation *in situ*. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

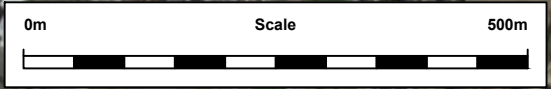
Full Archaeological Excavation involves the scientific removal and recording of all archaeological features, deposits and objects to the level of geological strata or the base level of any given development. Full archaeological excavation is recommended where initial investigation has uncovered evidence of archaeologically significant material or structures and where avoidance of the site is not possible. (CIfA 2020b)

Archaeological Test Trenching can be defined as ‘a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality.’ (CIfA 2020a)

Archaeological Monitoring can be defined as a ‘formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons within a specified area or site on land or underwater, where there is possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.’ (CIfA 2020c)



Legend	
	Site Boundary
	SMR Detail
	RMP Zone of Notification



IAC Archaeology

Title	Site location	Scale	1:7500@A4	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FB
		Job no.	J3649	Fig.	1
				Rev.	3



Total No. of Units	580	100.0%
Site Area	20.6 HA	
Site Developable Area	14.95 HA	
Density	38.8 units/HA	
Open spaces	2.25 HA	10%
4 bed	50	9%
3 bed	194	33%
2 bed	232	40%
1 bed	104	18%
Houses	403	70%
Bungalow (LLB)	25	3%
duplex Apartments	35	3%
Maisonettes	90	16%
HOUSES	468	81%
APARTMENTS / DUPLEX	112	19%

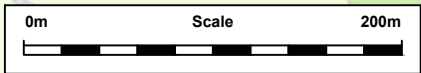


IAC Archaeology

Title	Plan of proposed development	Scale	1:4000@A4	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	15.08.23	Checked by	FB
		Job no.	J3649	Fig.	2
				Rev.	3



Legend
— Site Boundary
— Geophysical Trend



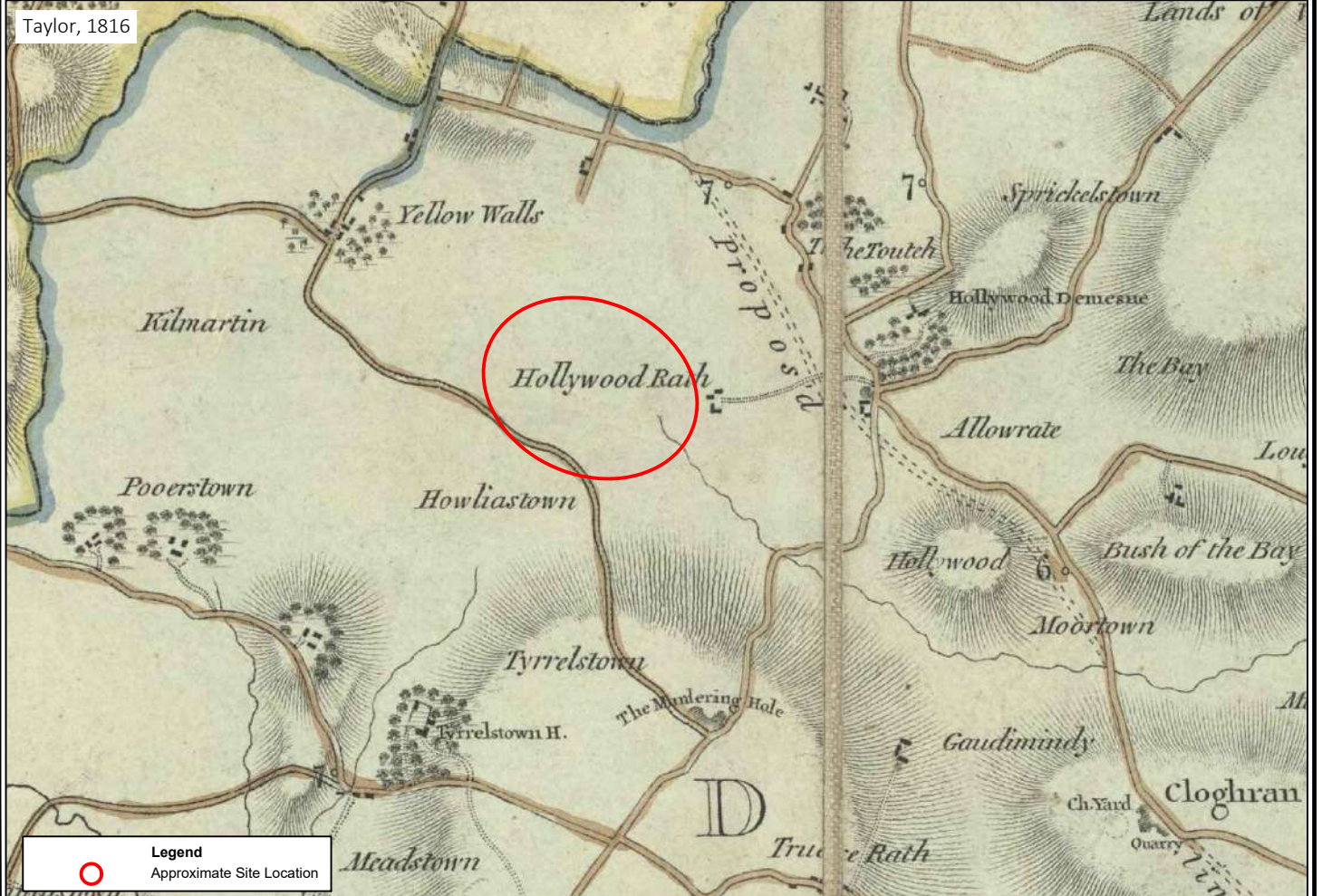
IAC Archaeology


Title	Geophysical survey results overlaying project footprint	Scale	1:4000@A4	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	3
				Rev.	2

Rocque, 1730



Taylor, 1816



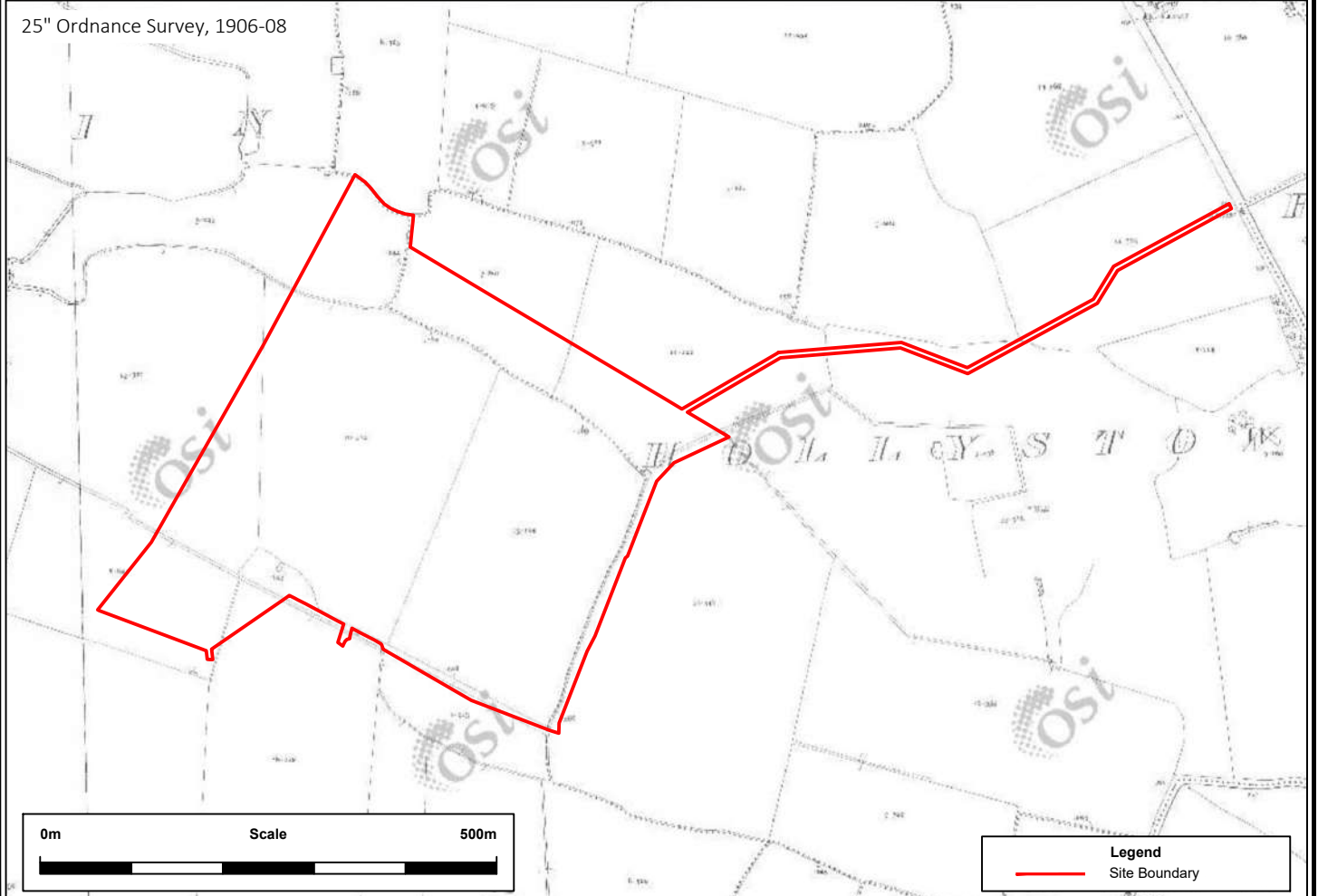
Legend
 Approximate Site Location

IAC Archaeology	Title	Extracts from Joh Rocque's (1760) and John Taylor's (1816) maps showing the approximate site location	Scale	NTS	Drawn by	RB	
	Project	Hollystown, Co. Dublin	Date	21/04/22	Checked by	FM	
			Job no.	J3649	Fig.	4	Rev.

6" Ordnance Survey, 1835



25" Ordnance Survey, 1906-08



Title	Extracts from the first edition 6 inch OS map (1835) and third edition 25 inch OS map (1906-08) showing the development area	Scale	1:7500@A4	Drawn by	RB
Project	Hollistown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	5
				Rev.	2



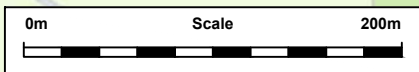
+ 706700 E
743500 N

+ 707300 E
743500 N

+ 707300 E
743000 N

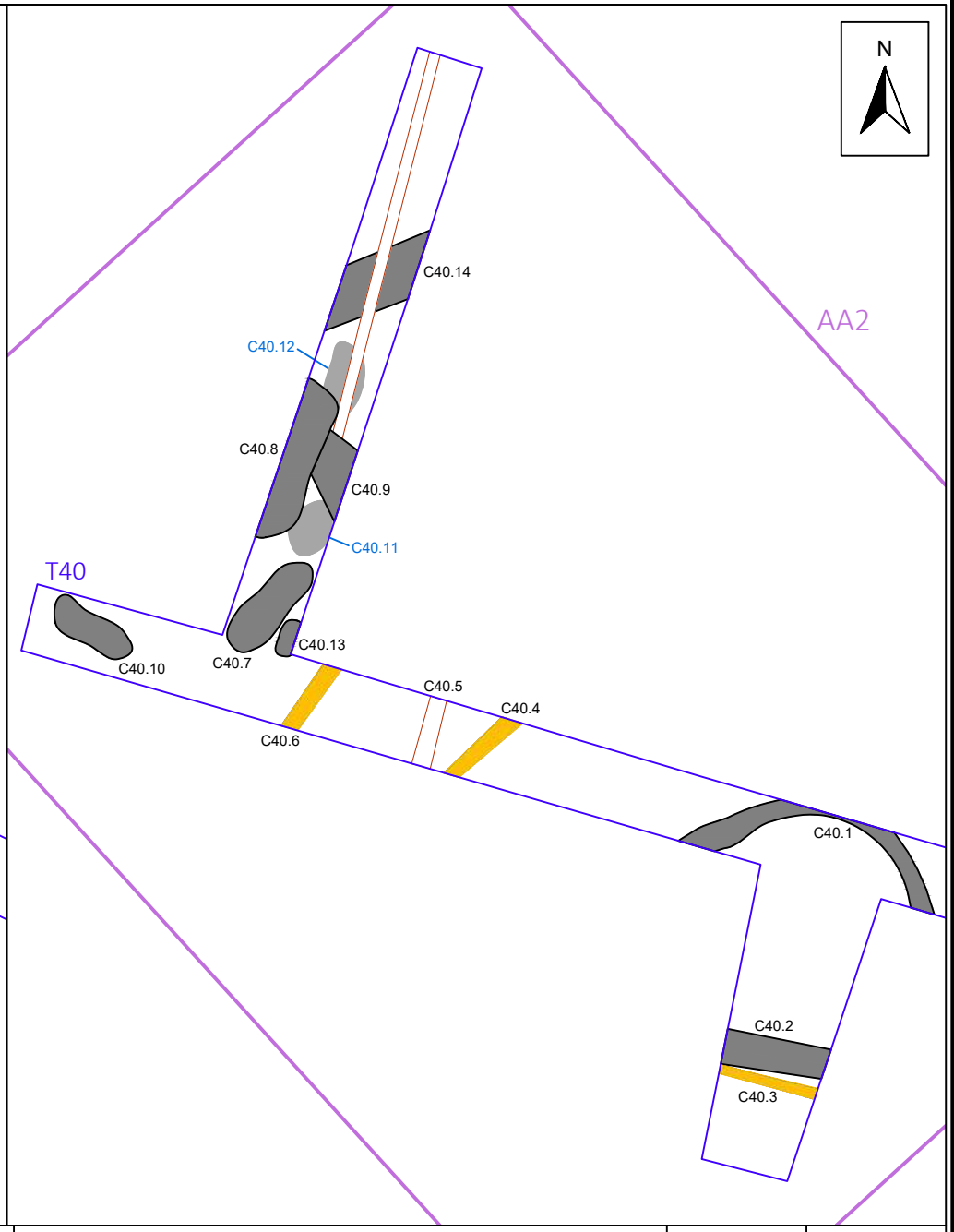
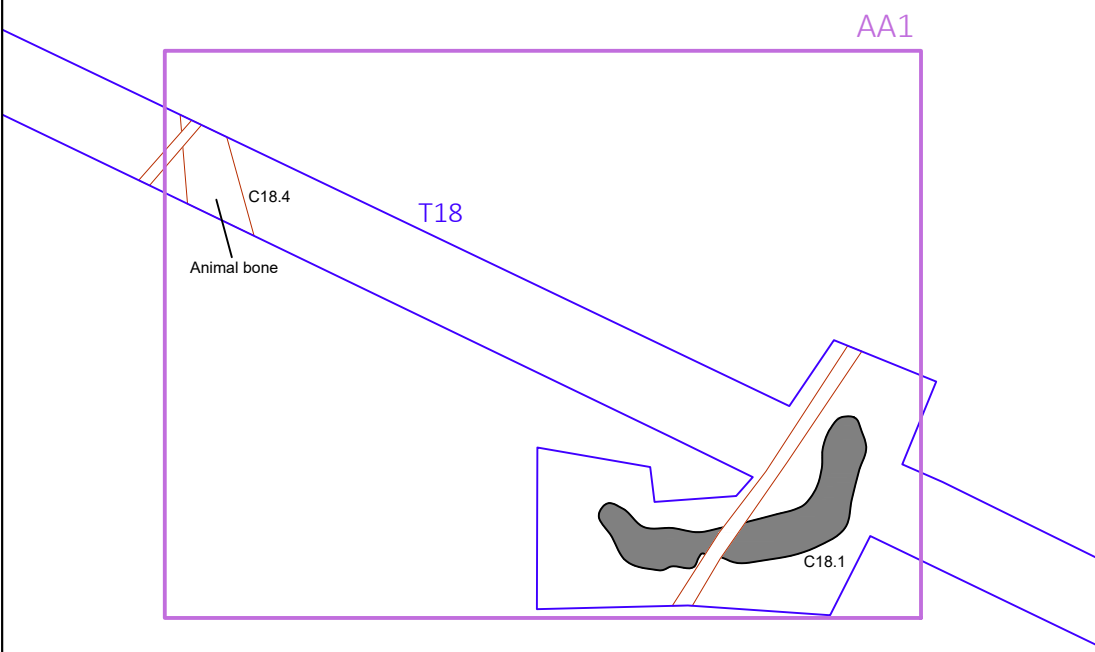
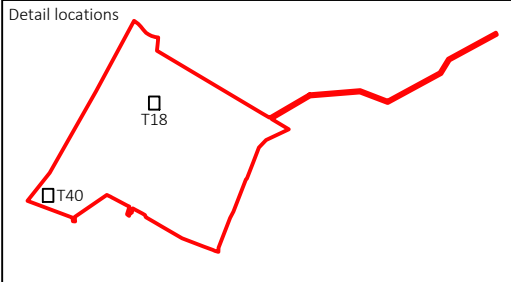
Legend

- Site Boundary
- Archaeological Area
- - - Area of Pipe Wayleave
- Test Trench
- Unexcavated Test Trench
- Geophysical Trend
- XXXXXX E
XXXXXX N Irish Transverse Mercator



IAC Archaeology

Title	Overall plan of excavated trenches	Scale	1:4000@A4	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	6
				Rev.	2



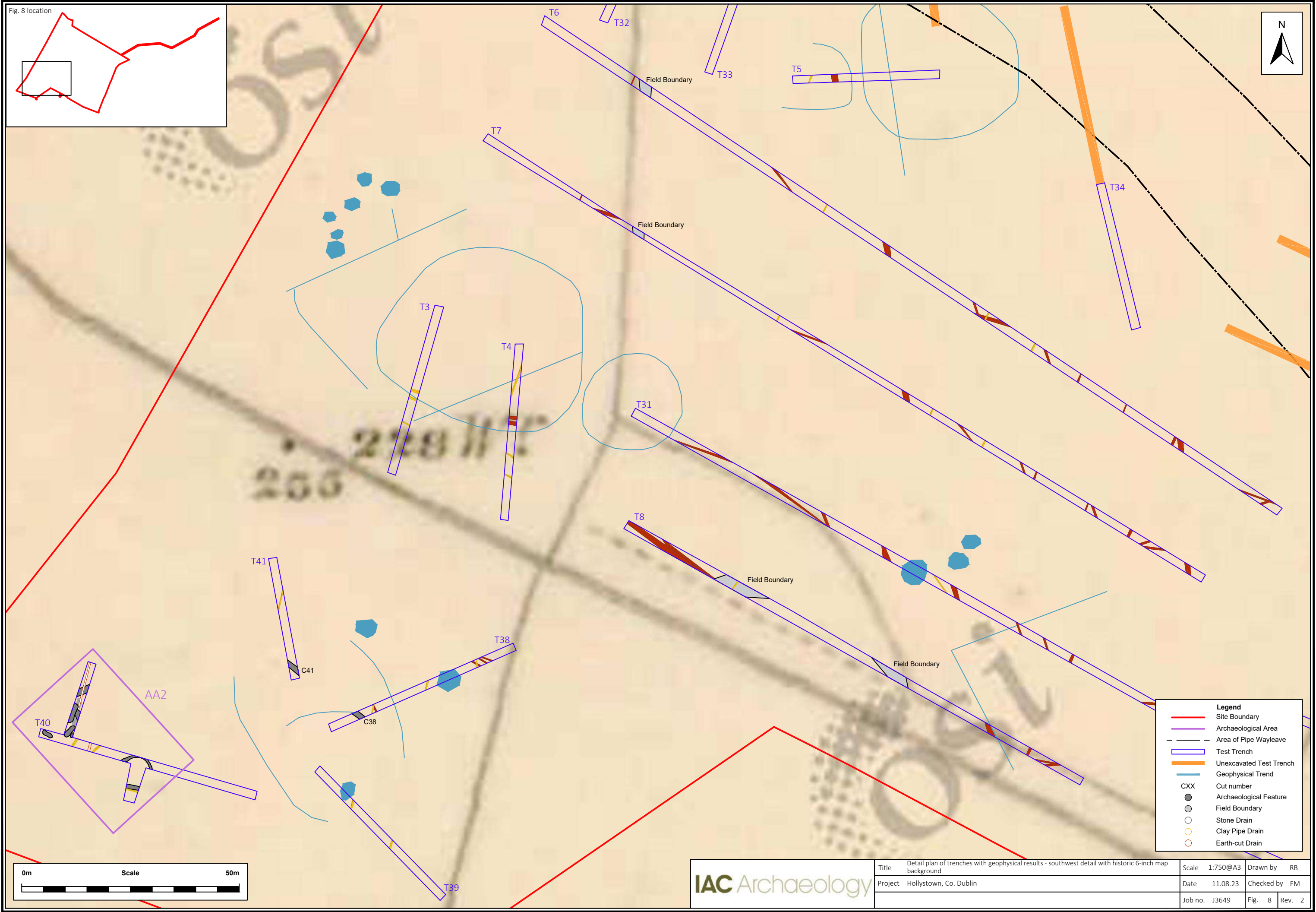
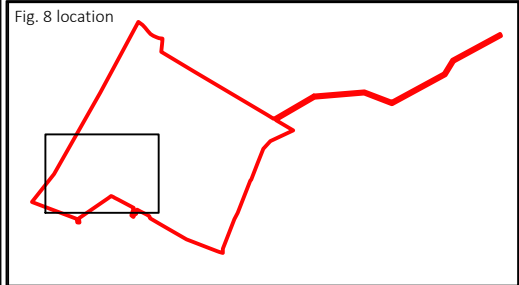
Legend

- Site Boundary
- Archaeological Area
- Test Trench
- CXX Cut number
- CXX Spread number
- Archaeological Feature
- Archaeological Spread
- Clay Pipe Drain
- Earth-cut Drain



IAC Archaeology

Title	Detail plan of archaeology found	Scale	1:200@A4	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	7
				Rev.	2

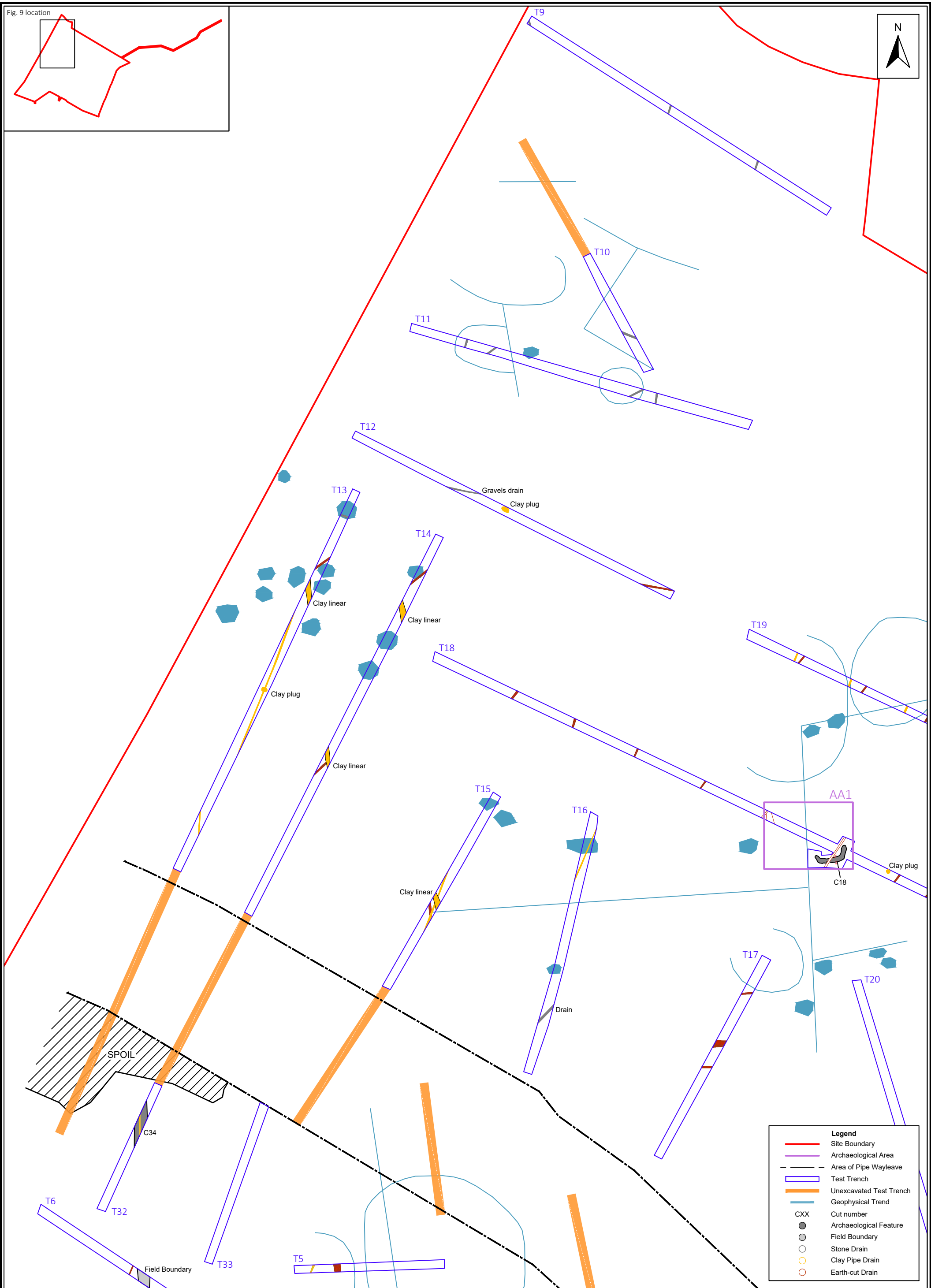
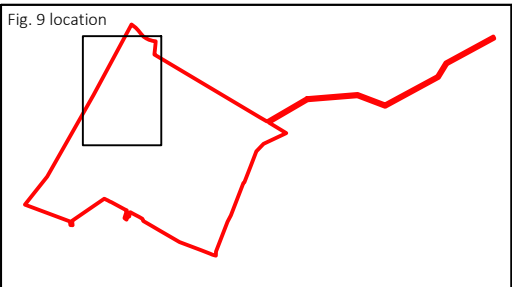


Legend	
	Site Boundary
	Archaeological Area
	Area of Pipe Wayleave
	Test Trench
	Unexcavated Test Trench
	Geophysical Trend
	Cut number
	Archaeological Feature
	Field Boundary
	Stone Drain
	Clay Pipe Drain
	Earth-cut Drain

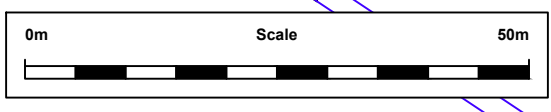


IAC Archaeology

Title	Detail plan of trenches with geophysical results - southwest detail with historic 6-inch map background	Scale	1:750@A3	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	8
				Rev.	2



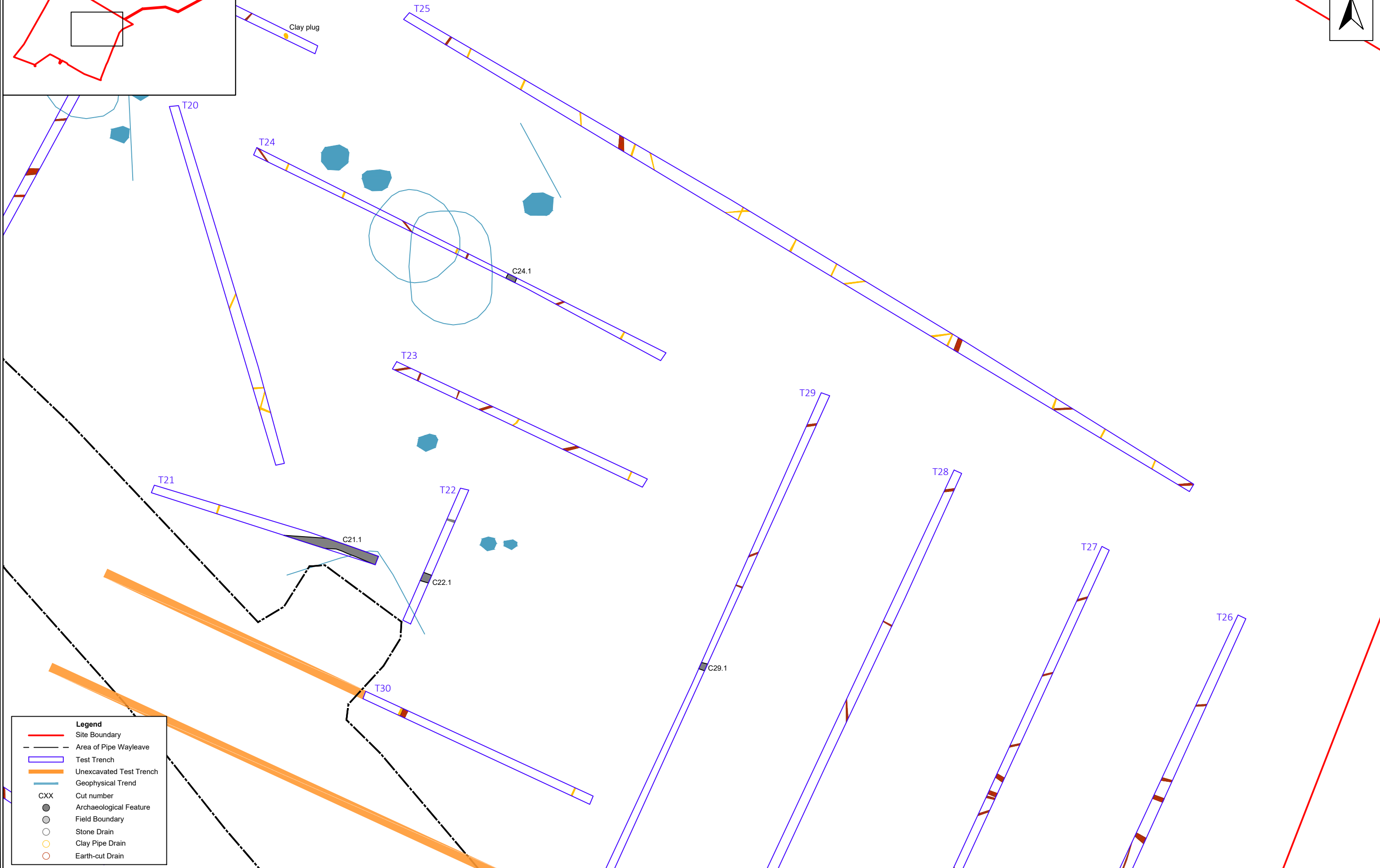
Legend	
—	Site Boundary
—	Archaeological Area
- - -	Area of Pipe Wayleave
	Test Trench
	Unexcavated Test Trench
—	Geophysical Trend
CXX	Cut number
●	Archaeological Feature
○	Field Boundary
○	Stone Drain
○	Clay Pipe Drain
○	Earth-cut Drain



IAC Archaeology

Title	Detail plan of trenches with geophysical results - northwest detail	Scale	1:750@A3	Drawn by	RB
Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM
		Job no.	J3649	Fig.	9
				Rev.	1

Fig. 10 location



Legend	
	Site Boundary
	Area of Pipe Wayleave
	Test Trench
	Unexcavated Test Trench
	Geophysical Trend
	Cut number
	Archaeological Feature
	Field Boundary
	Stone Drain
	Clay Pipe Drain
	Earth-cut Drain



	Title	Detail plan of trenches with geophysical results - northeast detail	Scale	1:750@A3	Drawn by	RB	
	Project	Hollystown, Co. Dublin	Date	11.08.23	Checked by	FM	
			Job no.	J3649	Fig.	10	Rev.

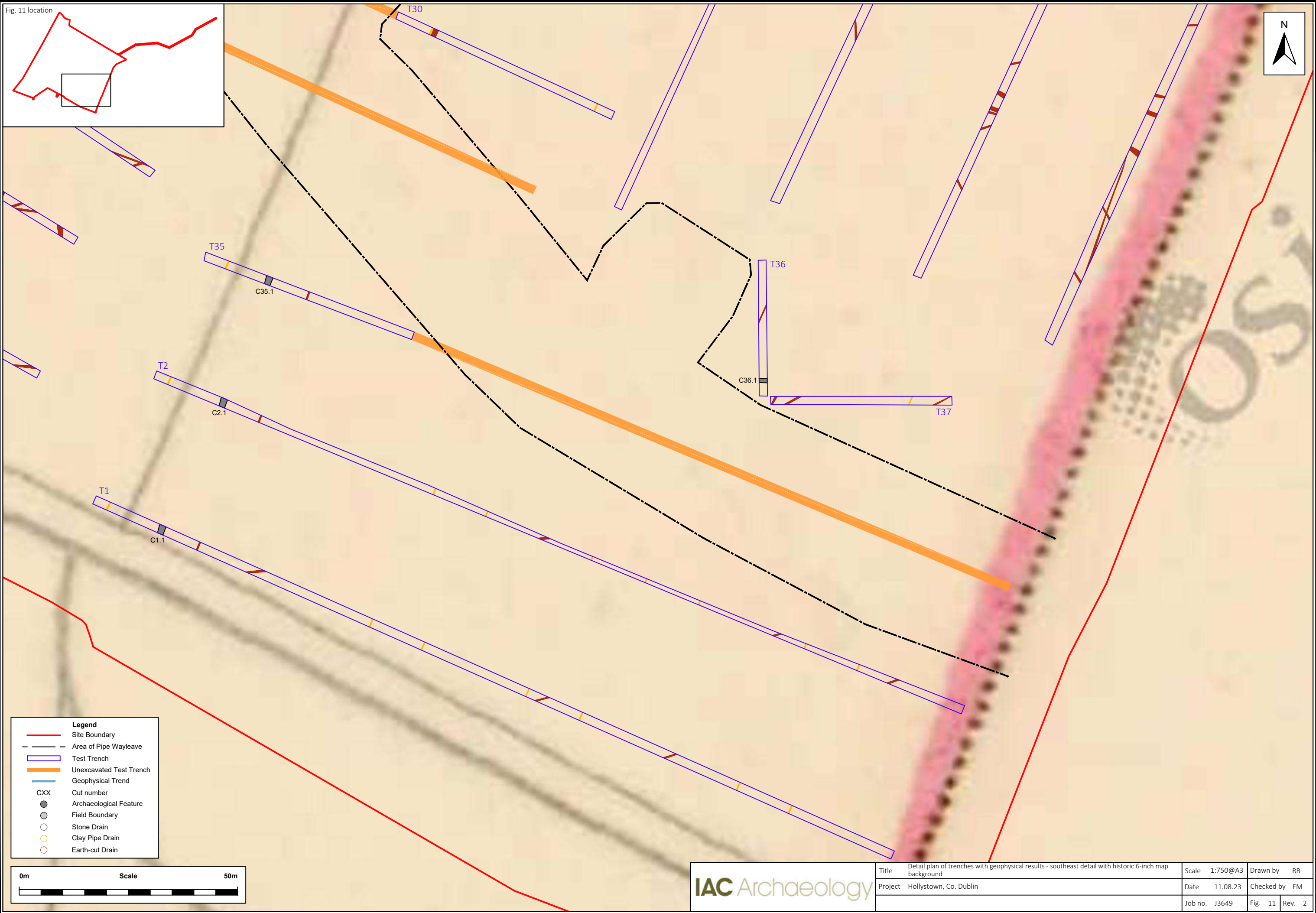
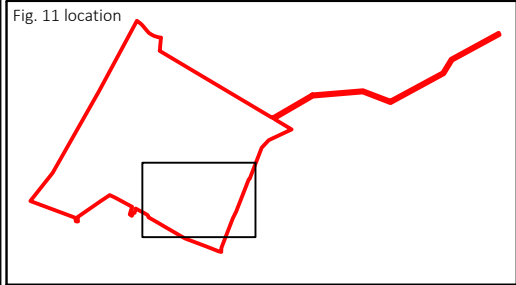




Plate 1 Southern portion of proposed development area, facing east



Plate 2 Northern portion of proposed development area, facing west



Plate 3 Wayleave for pipeline, facing west



Plate 4 Wayleave for pipeline, facing east



Plate 5 C-shaped possible kiln in Trench 18, facing west



Plate 7 Northern extension of Trench 40, facing north



Plate 6 Curvilinear slot trench C40.1, facing southeast



Plate 8 Drainage channel within Trench 4, facing east



Plate 9 Field drain aligned with geophysics anomaly, Trench 3, facing north



Plate 10 Drainage channel aligned with geophysics Trench 38, facing north



Plate 11 Drainage channel aligned with geophysics Trench 41, facing west



Plate 12 Trench 1, facing west



Plate 13 Trench 5, facing southwest



Plate 14 Trench 10, facing northwest



Plate 15 C18.1, Trench 18, facing west



Plate 16 C18.2-3, facing south



Plate 17 C18.4, facing southeast



Plate 18 C21.1, facing southeast



Plate 19 C22.1, facing west



Plate 20 Trench 27, facing north



Plate 21 C29.1, facing west



Plate 22 Geology change in Trench 37, facing west



Plate 23 C38.1, facing southwest



Plate 24 C40.1, facing west



Plate 25 C40.2, facing east



Plate 26 C40.5, facing north



Plate 27 C40.7, facing southeast



Plate 28 C40.8 and C40.9, facing east



Plate 29 C40.10, facing east



Plate 30 C40.12, facing south

Appendix 14.2: SMR/RMP Sites within the Study Area

SMR NO.	DU013-032
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706838,743183
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	Within the site
DESCRIPTION	An aerial photograph taken by in the 1980s (Dr Gillian Barrett) shows a series of cropmarks representing at least three enclosures (av. diam. c. 60-70m). Portion of an outer enclosing element is visible at the most western site. Not visible at ground level. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063) which identified a linear feature (1.5m wide x 0.4m deep) that mirrored the line of the southern side of the enclosure and may form part of this monument (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-039
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707050,743231
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	Within the site
DESCRIPTION	Aerial photograph (GB89. AF.03) shows cropmark of a curvilinear enclosure. The site was subject to geophysical survey (Licence no. 11R0152) which a number of isolated anomalies at the location of the monument but subsequent test excavation (Licence no. 12E0063) failed to identify any archaeological remains (Kavanagh 2012, 24).
REFERENCE	www.archaeology.ie/ SMR file



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SMR NO.	DU013-036
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706773,743116
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	Within the site
DESCRIPTION	<p>Aerial photographs (GB89. AF.05 & GB89. AE.07) show cropmark of a circular enclosure defined by a fosse and with a small contiguous cellular enclosure on its southern edge. This inner enclosure is surrounded by a widely spaced outer concentric fosse; a curved fosse extends from the outer enclosure suggesting the existence of a contiguous enclosure to the south-east.</p> <p>The site was subject to geophysical survey (Licence no. 11R0152) which detected linear features that mirrored the location of the monument but subsequent test excavation (Licence no. 12E0063) failed to identify the features conclusively (Kavanagh 2012, 24).</p>
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-037
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707004,743376
CLASSIFICATION	Enclosure
DIST. FROM DEVELOPMENT	Within the site
DESCRIPTION	<p>Aerial photograph (GB89. AE.12) shows cropmark of a curvilinear enclosure defined by a fosse. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063) which identified a curved linear ditch (1.45m wide, 0.45m deep) (Kavanagh 2012, 24).</p>



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REFERENCE	www.archaeology.ie/ SMR file
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SMR NO.	DU013-038
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706871,743411
CLASSIFICATION	Ring-ditch
DIST. FROM DEVELOPMENT	Within the site
DESCRIPTION	Aerial photograph (GB89. AE.12) shows cropmark of a ring-ditch. The site was subject to geophysical survey (Licence no. 11R0152) and subsequent test excavation (Licence no. 12E0063). No features of archaeological significance were noted but the water table is quite high in this area (Kavanagh 2012, 24)
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-004
RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Hollystown
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	707484,743474
CLASSIFICATION	Earthwork
DIST. FROM DEVELOPMENT	c. 84m north
DESCRIPTION	An aerial photograph taken in 1971 (FSI 1971/470/69) shows a roughly circular earthwork (diam.65m) on a natural rise in lands that have been incorporated into a golf course. There is no visible trace of this earthwork.
REFERENCE	www.archaeology.ie/ SMR file

SMR NO.	DU013-003
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RMP STATUS	Scheduled for inclusion in the next revision of the RMP
TOWNLAND	Kilmartin
PARISH	Mulhuddart
BARONY	Castleknock
I.T.M.	706871,743731
CLASSIFICATION	Earthwork
DIST. FROM DEVELOPMENT	c. 169m northwest
DESCRIPTION	The OS 1837 map edition shows an elongated earthwork marked 'mound' (est. dims. L 15m, Wth.10m). This site is located in lowland tillage. Not visible at ground level.
REFERENCE	www.archaeology.ie/ SMR file



Appendix 14.3: Legislation Protecting the Archaeological Resource

PROTECTION OF CULTURAL HERITAGE

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

THE ARCHAEOLOGICAL RESOURCE

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act 1997* are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described 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’ (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

OWNERSHIP AND GUARDIANSHIP OF NATIONAL MONUMENTS

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

REGISTER OF HISTORIC MONUMENTS

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months’ notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

PRESERVATION ORDERS AND TEMPORARY PRESERVATION ORDERS

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.



RECORD OF MONUMENTS AND PLACES

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for the Department of Housing, Local Government and Heritage) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that ‘where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice’.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989*, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document’s recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

THE PLANNING AND DEVELOPMENT ACT, AS AMMENDED

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

Fingal County Development Plan, 2023–2029

Policy HCAP2 – Importance of Archaeological Resource

Recognise the importance of our archaeological resource and provide appropriate objectives to ensure its appropriate retention, promotion and recording.

Policy HCAP3 – Record of Monuments and Places/ Sites and Monuments Record



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Safeguard archaeological sites, monuments, objects and their settings listed in the Record of Monuments and Places (RMP), Sites and Monuments Record (SMR), underwater cultural heritage including protected wrecks and any additional newly discovered archaeological remains.

Policy HCAP4 – Preservation-in-situ

Favour the preservation in-situ (or at a minimum preservation by record) of all sites and features of historical and archaeological interest.

Objective HCAO1 – Preservation-in-situ

Favour the preservation in situ or at a minimum preservation by record, of archaeological sites, monuments, features or objects in their settings. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service of the Department of the Housing, Local Government and Heritage.

Objective HCAO2 – Protection of RMPs/SMRs

Protect all archaeological sites and monuments, underwater archaeology, and archaeological objects, which are listed in the Record of Monuments and Places, Wreck Inventory of Ireland and all sites and features of archaeological and historic interest discovered subsequent to the publication of the Record of Monuments and Places, and to seek their preservation in situ (or at a minimum, preservation by record) through the planning process.

Objective HCAO3 – Management of Archaeological Resource

Encourage and promote the appropriate management and maintenance of the County's archaeological heritage, including historical burial grounds and underwater cultural heritage in accordance with conservation principles and best practice guidelines.

Objective HCAO4 – Industrial or Military Heritage

Secure the preservation in-situ of significant examples of industrial or military heritage.

Objective HCAO5 – Community Monuments Fund

Support the implementation of the Community Monuments Fund in order to ensure the monitoring and adaptation of archaeological monuments and mitigate against damage caused by climate change.

Objective HCAO6 – Climate Change and the Archaeological Resource

Co-operate with other agencies in the investigation of climate change on archaeological sites and monuments and to develop suitable adaptation measures to strengthen resilience and reduce the vulnerability of archaeological heritage in line with the National Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage 2019.

Policy HCAP5 – Development Design

Incorporate heritage features into infrastructure design at an early stage in the development planning and management process to protect and promote the cultural heritage resource and create awareness and interpretation.

Objective HCAO7 – Archaeology and Development Design

Ensure archaeological remains are identified and fully considered at the very earliest stages of the development process, that schemes are designed to avoid impacting on the archaeological heritage.



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Objective HCAO8 – Archaeological Impact Assessment

Require that proposals for linear development over one kilometre in length; proposals for development involving ground clearance of more than half a hectare; or developments in proximity to areas with a density of known archaeological monuments and history of discovery; to include an Archaeological Impact Assessment and refer such applications to the relevant Prescribed Bodies.

Objective HCAO9 – Archaeology in the Landscape

Ensure that in general development will not be permitted which would result in the removal of archaeological monuments with above ground features, protected wrecks and that this will be especially the case in relation to archaeological monuments which form significant features in the landscape.

Objective HCAO10 – Context of Archaeological Monuments

Ensure that development within the vicinity of a Recorded Monument or Zone of Archaeological Notification does not seriously detract from the setting of the feature and is sited and designed appropriately.

Objective HCAO11 – Impacts of large-scale development

Ensure that proposals for large scale developments and infrastructure projects consider the impacts on the archaeological heritage and seek to avoid them.

Objective HCAO12 – Coastal and Maritime Heritage

Co-operate with other agencies in the assessment of the potential for climate change to impact on coastal, riverine, inter-tidal and sub-tidal sites and their environments including shipwreck sites.

Objective HCAO13 – Findings of Archaeological Activity

Encourage reference to or incorporation of significant archaeological finds into development schemes, where appropriate and sensitively designed, through layout, in situ and virtual presentation of archaeological finds and by using historic place names and the Irish language where appropriate.

Objective HCAO14 – Archaeology in Open Space

Retain and manage appropriately archaeological monuments within open space areas in or beside developments, ensuring that such monuments are subject to an appropriate conservation management plan, are presented appropriately and are not left vulnerable, whether in the immediate or longer term, to dangers to their physical integrity or possibility of loss of amenity.



Appendix 14.4 Legislation Protecting the Architectural Resource

The main laws protecting the built heritage are the *Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999* and the *Local Government (Planning and Development) Acts 1963–1999*, which has now been superseded by the *Planning and Development Act, 2000*. The Architectural Heritage Act requires the Minister to establish a survey to identify, record and assess the architectural heritage of the country. The background to this legislation derives from Article 2 of the 1985 Convention for the Protection of Architectural Heritage (Granada Convention). This states that:

For the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member state will undertake to maintain inventories of that architectural heritage.

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligation under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architecture of Ireland (NIAH Handbook 2005:2). As inclusion in the inventory does not provide statutory protection, the survey information is used in conjunction with the *Architectural Heritage Protection Guidelines for Planning Authorities* to advise local authorities on compilation of a Record of Protected Structures as required by the *Planning and Development Act, 2000*.

PROTECTION UNDER THE RECORD OF PROTECTED STRUCTURES AND COUNTY DEVELOPMENT PLAN

Structures of architectural, cultural, social, scientific, historical, technical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the act. This act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1st January 2000.

The 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 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' and enjoy equal statutory protection. Under the act the entire structure is protected, including a structure's interior, exterior, attendant grounds and also any structures within the attendant grounds.

The act defines a Protected Structure as (a) a structure, or (b) a specified part of a structure which is included in a Record of Protected Structures (RPS), and, where that record so indicates, includes any specified feature which is in the attendant grounds of the structure and which would not otherwise be included in this definition. Protection of the structure, or part thereof, includes conservation, preservation, and improvement compatible with maintaining its character and interest. 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 and states that no works should materially affect the character of the structure or any element of the structure that contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The act does not provide specific criteria for assigning a special interest to a structure. However, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field workers as to how to designate a building with a special interest, which are not mutually exclusive. This offers guidance by example rather than by definition:



ARCHAEOLOGICAL

It is to be noted that the NIAH is biased towards post-1700 structures. Structures that have archaeological features may be recorded, providing the archaeological features are incorporated within post-1700 elements. Industrial fabric is considered to have technical significance, and should only be attributed archaeological significance if the structure has pre-1700 features.

ARCHITECTURAL

A structure may be considered of special architectural interest under the following criteria:

- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- A structure that makes a positive contribution to a setting, such as a streetscape or rural setting
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well-designed decorative features, externally and/or internally

HISTORICAL

A structure may be considered of special historical interest under the following criteria:

- A significant historical event associated with the structure
- An association with a significant historical figure
- Has a known interesting and/or unusual change of use, e.g. a former workhouse now in use as a hotel
- A memorial to a historical event.

TECHNICAL

A structure may be considered of special technical interest under the following criteria:

- Incorporates building materials of particular interest, i.e. the materials or the technology used for construction
- It is the work of a known or distinguished engineer
- Incorporates innovative engineering design, e.g. bridges, canals or mill weirs
- A structure which has an architectural interest may also merit a technical interest due to the structural techniques used in its construction, e.g. a curvilinear glasshouse, early use of concrete, cast-iron prefabrication.
- Mechanical fixtures relating to a structure may be considered of technical significance.

CULTURAL

A structure may be considered of special cultural interest under the following criteria:

- An association with a known fictitious character or event, e.g. Sandycove Martello Tower, which featured in Ulysses.
- Other structure that illustrate the development of society, such as early schoolhouses, swimming baths or printworks.

SCIENTIFIC

A structure may be considered of special scientific interest under the following criteria:



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- A structure or place which is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g. Mizen Head Bridge, Birr Telescope.

SOCIAL

A structure may be considered of special social interest under the following criteria:

- A focal point of spiritual, political, national or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.
- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

ARTISTIC

A structure may be considered of special artistic interest under the following criteria:

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well-designed mass-produced structures or elements may also be considered of artistic interest.

(From the NIAH Handbook 2003 & 2005 pages 15–20)

The Local Authority has the power to order conservation and restoration works to be undertaken by the owner of the protected structure if it considers the building to need repair. Similarly, an owner or developer must make a written request to the Local Authority to carry out any works on a protected structure and its environs, which will be reviewed within three months of application. Failure to do so may result in prosecution.

Fingal County Development Plan, 2023–2029

Policy HCAP8 – Protection of Architectural Heritage

Ensure the conservation, management, protection and enhancement of the architectural heritage of Fingal through the designation of Protected Structures and Architectural Conservation Areas, the safeguarding of designed landscapes and historic gardens, and the recognition of structures and elements with no specific statutory designation that contribute positively to the vernacular, industrial, maritime or 20th century heritage of the County.

Policy HCAP9 – Re-use of Architectural Heritage

Champion the maintenance, repair, re-use and sensitive retro-fitting of the architectural heritage and older building stock of the County as a cornerstone of its sustainable development policy and will require that adaptive re-use and regeneration adheres to best conservation practice.

Policy HCAP10 – Retention

Continue to support and encourage the sympathetic and appropriate reuse, rehabilitation and retention of protected structures and historic buildings ensuring the special interest, character and setting of the building or structure is preserved.



Appendix 14.5 Impact Assessment and the Cultural Heritage Resource

POTENTIAL IMPACTS ON ARCHAEOLOGICAL AND HISTORICAL REMAINS

Impacts are defined as ‘the degree of change in an environment resulting from a development’ (Environmental Protection Agency 2017). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

PREDICTED IMPACTS

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;



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- Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialist.



Appendix 14.6 Mitigation Measures and the Cultural Heritage Resource

1.1.1 POTENTIAL MITIGATION STRATEGIES FOR CULTURAL HERITAGE REMAINS

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ*.

1.1.2 DEFINITION OF MITIGATION STRATEGIES

1.1.2.1 ARCHAEOLOGICAL RESOURCE

The ideal mitigation for all archaeological sites is preservation *in situ*. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

Archaeological Test Trenching can be defined as ‘a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate’ (CIfA 2020a).

Full Archaeological Excavation can be defined as ‘a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design’ (CIfA 2020b).

Archaeological Monitoring can be defined as ‘a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CIfA 2020c).

Underwater Archaeological Assessment consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able to access and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.



Appendix 18.1 Utility Maps





TITLE:
20220727-035_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: 27-Jul-2022

** SCALE: 1:2500

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

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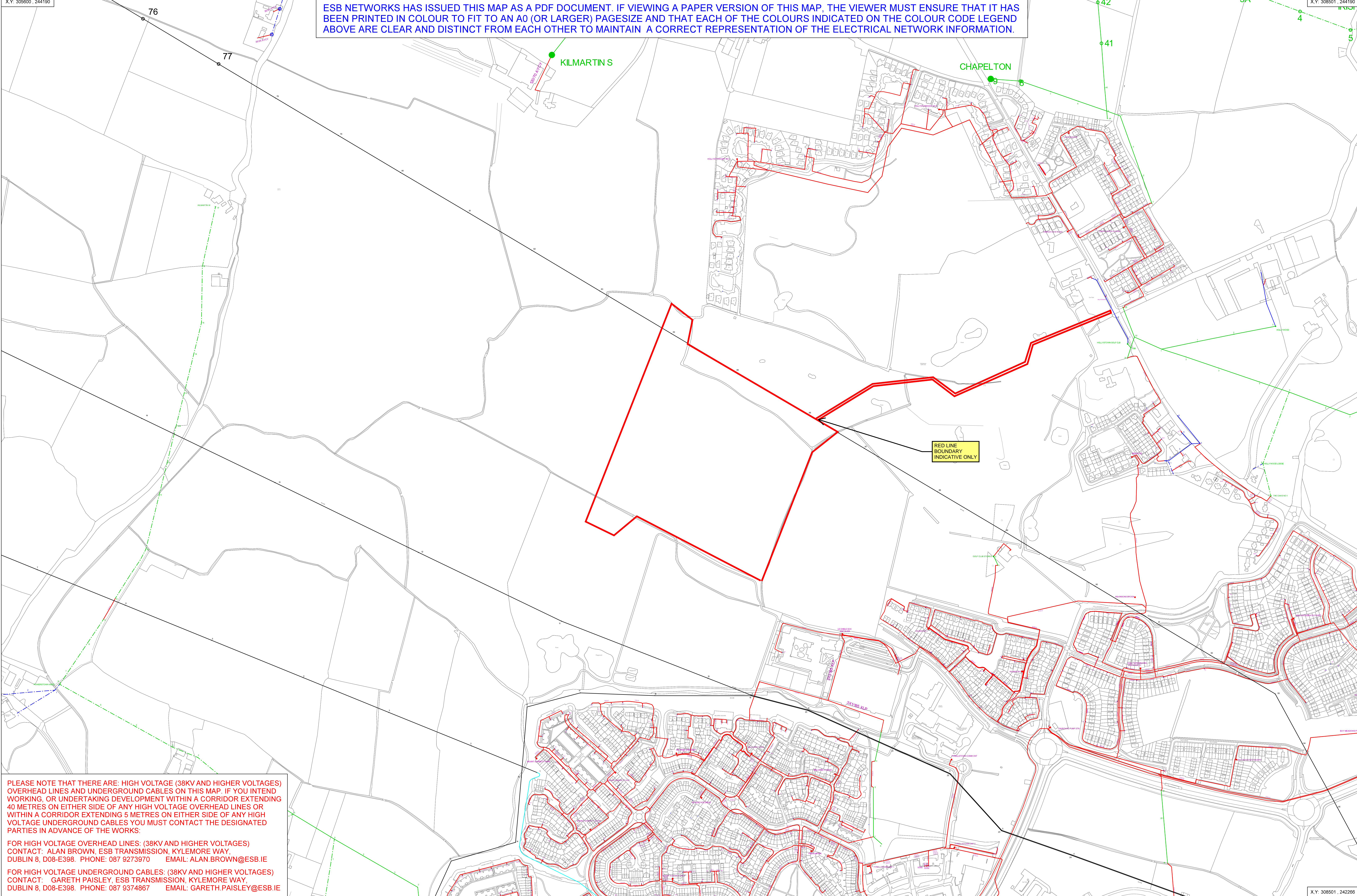
WARNING

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 1800 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 LOCATOR 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: 305600, 244190

X,Y: 308501, 244190

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: 308501, 242266



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 1800 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 (0818 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.

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 Aurora Telecom Duct











 Aurora Telecom Sub Duct




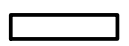

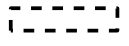








 Aurora Telecom Inserted Gas Pipe

Aurora Telecom Queries - 01-8926166 (Office Hours)

 Aurora_Network_Queries@gasnetworks.ie

 Aurora Telecom Emergency Only 1800 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

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

** Please contact GNI on 1800-427747 for specific information



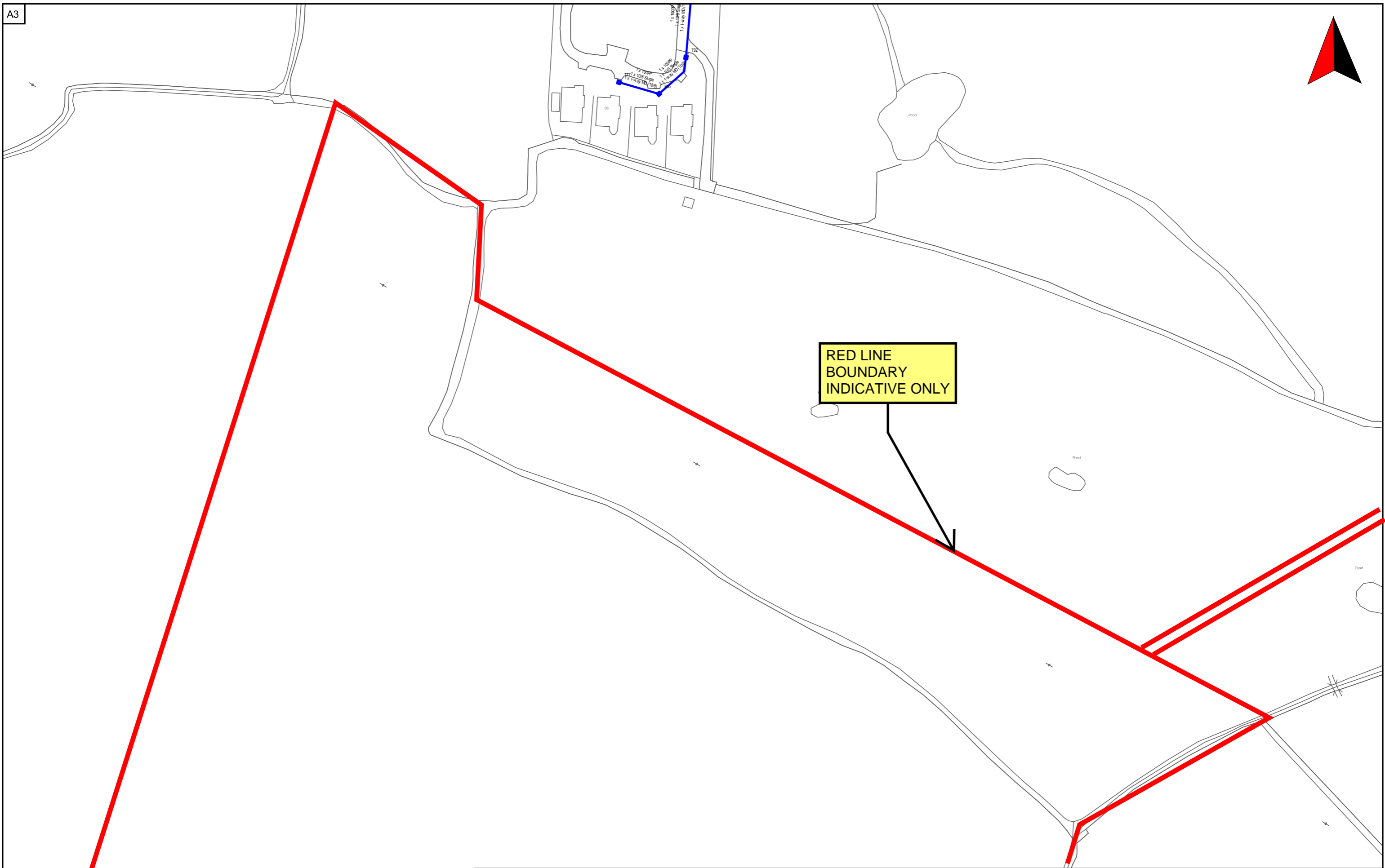
DIAL BEFORE YOU DIG
1800 4277 47

In Emergency call
1800 20 50 50



GAS NETWORK INFORMATION

Description:	
Location:	706985,743245
Plot Date:	22/07/2022 14:41
Scale:	5000 @ A3
Plotted By:	3586
Ref ID:	3586_22072022144159



RED LINE
BOUNDARY
INDICATIVE ONLY

open eir Civil Engineering Infrastructure Service

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 307167 m, 243378 m

Date
25/07/2022

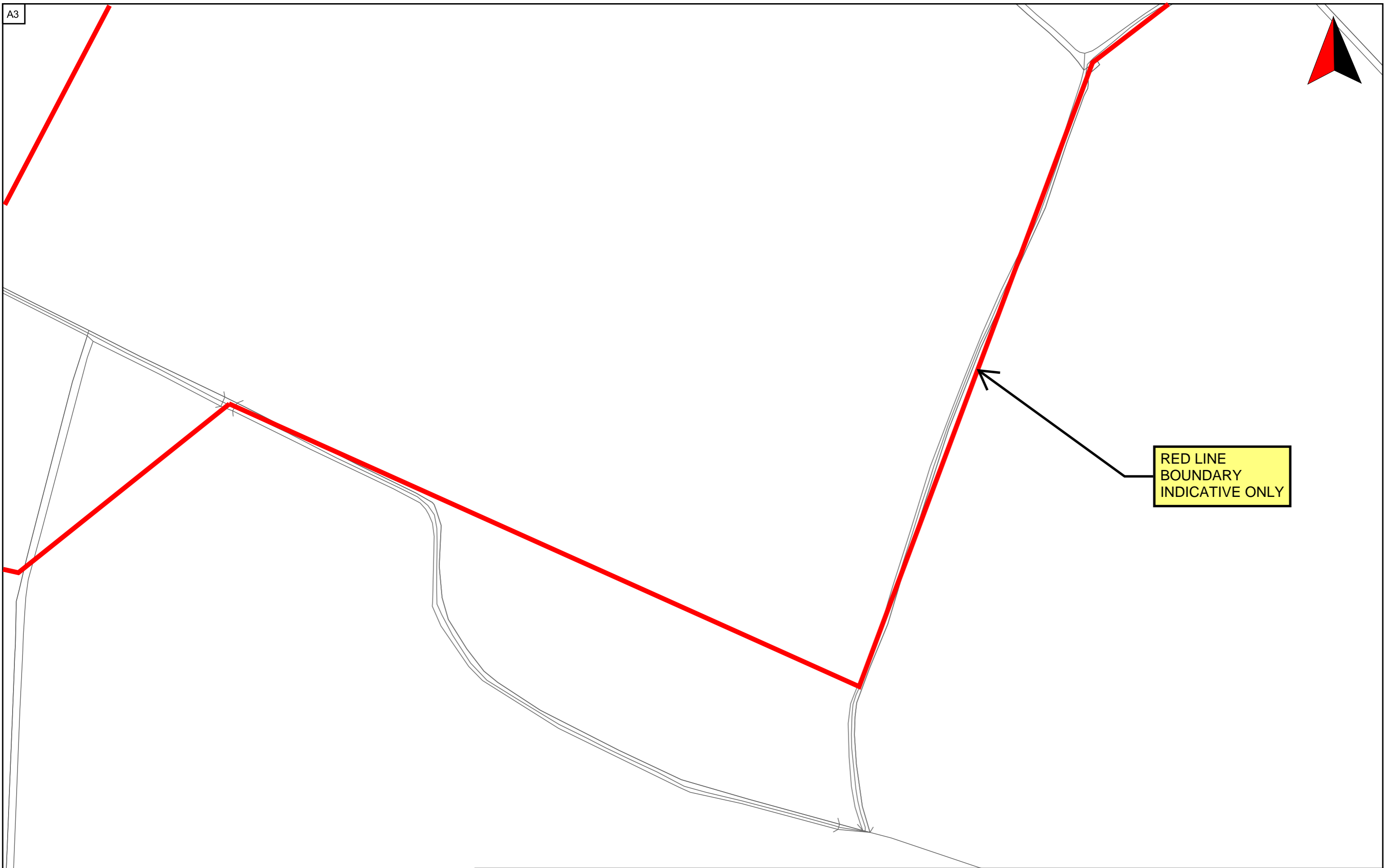
Smallworld
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RED LINE
BOUNDARY
INDICATIVE ONLY

open eir Civil Engineering Infrastructure Service

Scale: 1:1500

Irish National Grid Co-Ordinates
Centre XY: 307157 m, 243039 m

Date
25/07/2022

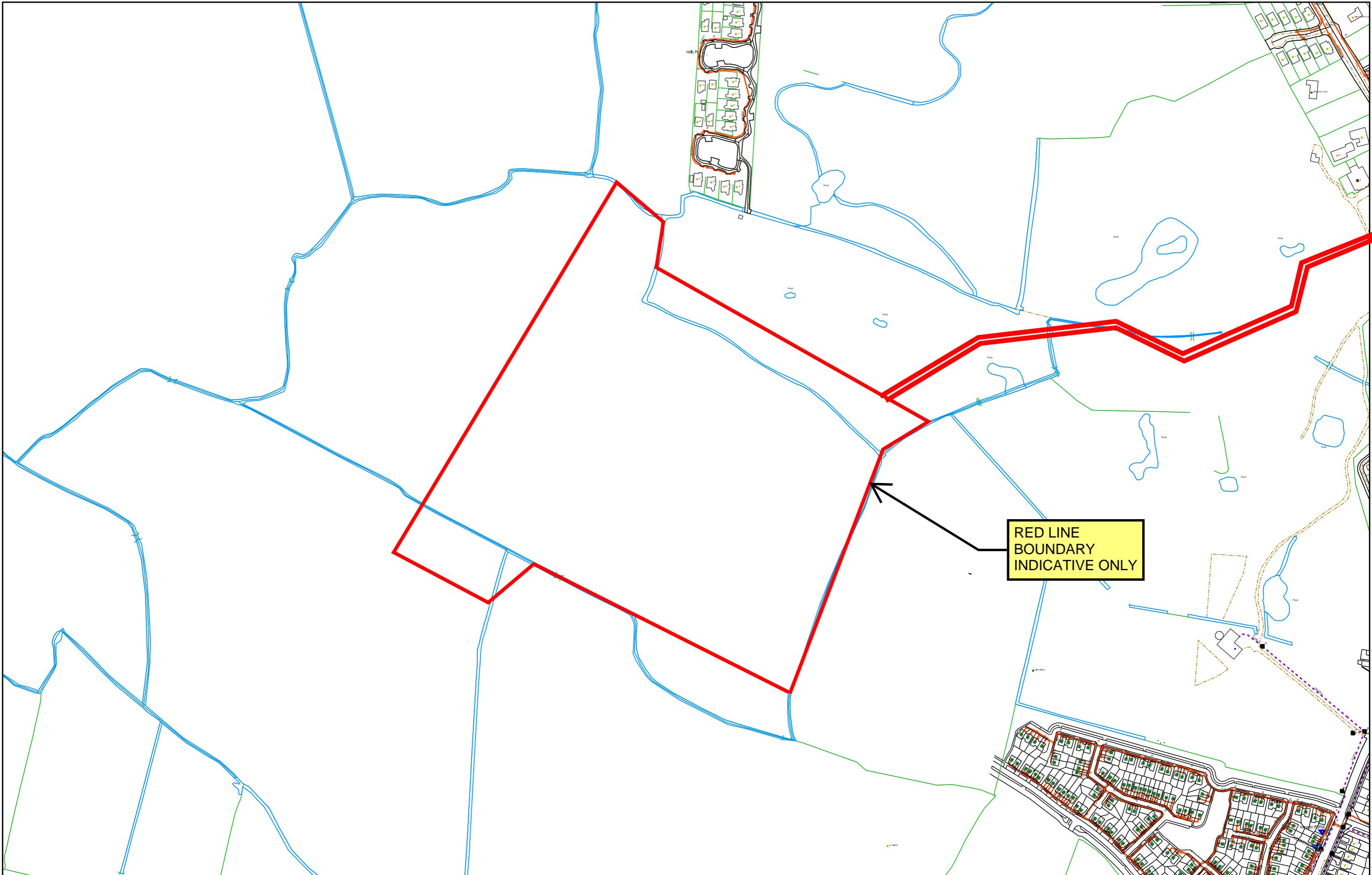
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RED LINE
BOUNDARY
INDICATIVE ONLY



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

PROJECT NAME
DESIGNED BY:

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Produced on: 26/07/2022



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