

Appendix 2-1

Road Legal Agreement

Land Registry

County Galway

Folio 121724F

Register of Ownership of Freehold Land

Part 1(A) - The Property

Note: Unless a note to the contrary appears, neither the description of land in the register nor its identification by reference to the Registry Map is conclusive as to boundaries or extent

No.	For parts transferred see Part 1(B) Description	Official Notes
1	<p>The property shown coloured Red as plan(s) 17, DHVY5 on the Registry Map, situate in the Townland of MONEYDUFF, in the Barony of DUNKELLIN, in the Electoral Division of CLARINBRIDGE.</p> <p>The Registration does not extend to the mines and minerals</p>	From Folio GY5620N

- 1 10-OCT-2017 D2017LR138723K There is appurtenant to the property the easement(s) as specified in Instrument D2017LR138723K over part of the townland of ORANHILL by the way shown coloured yellow on folios GY107698F, GY116107F and GY116108F of the Registry Map.
- 2 12-OCT-2017 D2017LR138726P Note: Entry added under Rule 7. Q2018LR000168K. 16-JAN-2018. There is appurtenant to the property the easement(s) as specified in Instrument D2017LR138726P over part of the townland of MONEYDUFF by the way shown coloured yellow on folios GY5620 and GY29395F of the Registry Map.
- Note: Entry added under Rule 7. Q2018LR001136E. 16-JAN-2018.

Land Registry

County Galway

Folio 121724F

Part 1(B) - Property

Parts Transferred

No.	Prop No:	Instrument:	Date:	Area(Hectares):	Plan:	Folio No:

Land Registry

County Galway

Folio 121724F

Part 2 - Ownership

Title ABSOLUTE

No.	The devolution of the property is subject to the provisions of Part II of the Succession Act, 1965
1	<p>12-OCT-2017 ARLUM LIMITED (CRO reference 312486) of Wolfe Tone House, Fr D2017LR138726P Griffin Road, County Galway is full owner.</p>

Land Registry

County Galway

Folio 121724F

Part 3 - Burdens and Notices of Burdens

No.	Particulars
1A	<p>05-MAY-1972 Y 1707/72</p> <p>The conditions relating to the use and enjoyment of the parts of the property shown coloured yellow on plan DHVY5 (O.S. 95/5) and shown edged red as plan 17 (O.S. 95/5) as specified in Instrument No. Y 1707/72 .</p> <p>Note : The burdens at entries 1a and 1b rank in equal priority .</p> <p>Note: Description revised. D2017LR138726P.</p>
1B	<p>05-MAY-1972 Y 1707/72</p> <p>Full right and liberty for Sean Kilraine, his heirs, executors, administrators, the registered owner of the property comprised in folio GY56523, his lessees and assigns, at all times to go pass and repass over the property herein by the way shown coloured yellow on plan DHVY5 (O.S. 95/5) for the purpose specified in Instrument No. Y 1707/72 .</p> <p>Note : The burdens at entries 1a and 1b rank in equal priority .</p> <p>Note: Description revised. D2017LR138726P.</p>
2	<p>10-OCT-2017 D2017LR138723K</p> <p>The right of way and such other easements as specified in Instrument D2017LR138723K in favour of the registered owners of the property comprised in folios GY116107F, GY116108F and GY107698F, their heirs, assigns and others as specified therein, affecting the part of the property shown coloured yellow on plan DHVY5 of the Registry Map.</p>

Kieran Murphy & Co.

BREDA TIERNEY KEVIN McNAMARA
GEMMA FORDE

Dublin Office:
24/26 Upr. Ormond Quay
DX 4537 Galway

Solicitors
9 The Crescent, Galway
H91 W6T7

Tel. 091-587171
Fax 091-584660
Email: law@kieranmurphy.com
7th March 2018.

Our Ref.
KMcN/CD/RHA20170034

Your Ref.

TO WHOM IT MAY CONCERN

Re: Arlum Limited
 Lands at Moneyduff, Oranmore, Co. Galway.

Dear Sir/Madam,

The above Company is the registered owner of the property described in Folio 121724F County Galway. We attach hereto copy PRA Printout of the said Folio together with PRA Screenshot of the Folio Plan, both printed from landdirect.ie today.

The property described in Folio 121724F County Galway has the benefit of appurtenant rights of way, wayleave and other easements, rights and privileges, allowing access and egress to and from the public road, as specified in Land Registry Instrument Numbers D2017LR138723K and D2017LR138726P, registered as appurtenant rights at Entry Nos. 1 and 2, Part 1 (A) of Folio 121724F County Galway. Subject to the provisions of the said Instruments, our client has an entitlement to construct the roads and services necessary for development of the above property.

Yours faithfully,


Kevin McNamara

Appendix 2-2

Meeting with Galway County Council Details

Moneyduff, Oranmore Development

SUBJECT: MEETING WITH COUNCIL PLANNERS REGARDING LINK ROAD

VENUE: Galway County Council

DATE: 25th January 2018

TIME: 2.30 pm

ATTENDANCE: Michael Timmins – Galway Co Co (MT), Valerie Loughnane – Galway Co Co (VL), Padraic Rhatigan – Arlum Ltd (PR), Paul Fitzmaurice – Arlum Ltd (PF), Gus McCarthy - MKOS (GMC).

GMC presented background to the development and outlined the relevant details regarding the access road and delivery of same. This would be carried out under phase 1 of planning ref 09/1925 as permitted under same. A “partial” commencement notice would be used.

PR outlined the history of the site and Arlum’s plans for the development of same. PR outlined the basis of the legal agreement under which Arlum have the right to construct the access road (and related services) under the existing Roykeel Planning grant. Arlum, Roykeel and Galway County Council are all party to this binding legal agreement.

PF outlined a summary of the previous meeting between Michael Lally (Tobin Engineering), Brendan Rudden (Tobin Engineering), PF and John Costello. This meeting was held on the 19th of July at 11am in County Councils Office. JC had confirmed that a TIA would not be required for the proposed Arlum development, on the basis that the access road was to be constructed under the existing planning (09/1925). JC stated that we would need to get confirmation from the planning dept. that we were permitted to develop the access road under the existing Roykeel Planning (and our associated legal agreement).

MT and VL confirmed that there is no planning issue which would prevent Roykeel / Cannons (or another party acting on their behalf) completing the access road under Phase 1 of the existing planning permission.

The planning application for the development of our site would be by way of a separate SHD application. We would need to confirm the fact that we have an entitlement to develop the road under the Roykeel/Cannon 09 application by way

of a solicitor's letter (or similar format to be agreed with Council). We would also need to confirm that we have a ROW over the road for access and services. VL confirmed that the access road should be highlighted in yellow as a ROW for the purposes of the planning application.

MT confirmed that (if necessary), we would be able to amend the specification of the road post the SHD planning grant (by agreement with the council) under the conditions of the existing planning. This would allow for any improved Road Safety Requirements to be allowed for (if required by council). The road corridor under the 09-planning grant is sufficiently wide to allow for any potential requirements.

MT confirmed that we would need to agree any changes to traffic / roads issues with Galway Co Co Roads Dept.

Appendix 2-3

Scoping Responses

John Staunton

From: info@birdwatchireland.ie
Sent: 05 June 2018 09:25
To: John Staunton
Subject: RE: 170831a - FAO: Policy and Advocacy Team

Hi John,
Thank you .

Regards,
Michelle Kavanagh,
Membership Department.
BirdWatch Ireland
Unit 20 Block D | Bullford Business Campus | Kilcoole | Greystones | A63 RW83 | Co.Wicklow | Ireland
Tel: +353 (0)1 281 9878 email: mkavanagh@birdwatchireland.ie
Website: www.birdwatchireland.ie

BirdWatch Ireland - protecting wild birds and their habitats

BirdWatch Ireland - protecting birds and biodiversity

Cairde Éanlaith Éireann - ag caomhnú éin agus bithéagsúlacht

To join as a member, make a donation, volunteer or shop online visit www.birdwatchireland.ie or call us on +353 (0)1 281 9878

From: John Staunton <jstaunton@mccarthykos.ie>
Sent: 01 June 2018 18:11
To: info@birdwatchireland.ie
Subject: 170831a - FAO: Policy and Advocacy Team

Dear Sir/Madam,

Please see the attached scoping letter.

Kind regards,

John

John Staunton BSc. (Env); PhD.
Project Environmental Scientist

McCarthy Keville O'Sullivan Ltd.
Planning & Environmental Consultants

Block 1, G.F.S.C. Moneenageisha Road, Galway.
T: (091) 73 56 11 || E: info@mccarthykos.ie || W: www.mccarthykos.ie

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John Staunton

From: Manager Dau <Manager.Dau@chg.gov.ie>
Sent: 05 June 2018 12:34
To: John Staunton
Subject: RE: 170831a - Scoping Letter

Your Ref: 170831a

Our Ref: **G Pre00143/2018** (Please quote in all related correspondence)

A Chara

On behalf of the Department of Culture, Heritage and the Gaeltacht, I acknowledge receipt of your recent consultation. In the event of observations, you will receive a response by email from Development Applications Unit (DAU) on behalf of the Department.

The normal target turnaround is six weeks from date of receipt. If observations are received before this time, DAU will be in contact at that stage.

If you have not heard from DAU and wish to receive an update, please telephone the direct line number below or email manager.dau@chg.gov.ie.

Le meas

Yvonne Nolan
Development Applications Unit
Department of Culture, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

(053) 9117382



**An Roinn Cultúir,
Oidhreacht agus Gaeltachta**
**Department of Culture,
Heritage and the Gaeltacht**

From: John Staunton [mailto:jstaunton@mccarthykos.ie]
Sent: 01 June 2018 18:14
To: Manager Dau
Subject: 170831a - Scoping Letter

Dear Sir/Madam,

Please find attached a scoping letter for a proposed development near Oranmore, Co. Galway.

Kind regards,

John

John Staunton BSc. (Env); PhD.
Project Environmental Scientist

McCarthy Keville O'Sullivan Ltd.
Planning & Environmental Consultants

Block 1, G.F.S.C. Moneenageisha Road, Galway.
T: (091) 73 56 11 || E: info@mccarthykos.ie || W: www.mccarthykos.ie

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Deimhnítear leis an bhfo-nóta seo freisin go bhfuil an teachtaireacht ríomhphoist seo scuabtha le bogearraí frithvórais chun vórais ríomhaire a aimsiú.

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John Staunton

From: esbnetworks@esb.ie
Sent: 01 June 2018 18:20
To: John Staunton
Subject: RE: 170831a - Scoping Letter



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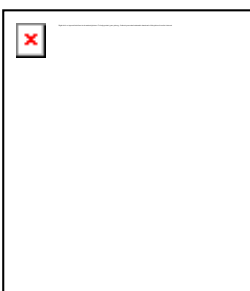
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* * * * *

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Is tuairimí nó dearchthaí an údair amháin aon tuairimí nó dearchthaí ann, agus ní gá gurb ionann iad agus tuairimí nó dearchthaí ESB.

Má bhfuair tú an ríomhphost seo trí earráid, ar mhiste leat é sin a chur in iúl don seoltóir.

Scanann ESB ríomhphoist agus ceangaltáin le haghaidh víreas, ach ní ráthaíonn sé go bhfuil ceachtar díobh saor ó víreas agus ní glacann dliteanas ar bith as aon damáiste de dhroim víreas.

<https://www.esb.ie/contact>

John Staunton

From: Networks General <esbnetworks@esb.ie>
Sent: 05 June 2018 16:01
To: John Staunton
Subject: RE: 170831a - Scoping Letter <<#470778-2648229-2949285#>>



Good Afternoon John

Thank you for your email.

I have forwarded your email and attachment to the relevant office,

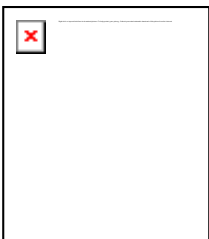
If necessary they will be in contact directly.

Please contact me again if I can be of further assistance.

Kind regards

Jacqui

ESB Networks Customer Care | T: 1850 372 757 | +353 21 4947260 | F: +353 21 4844261 | www.esbnetworks.ie



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Received: 01/06/2018 17:15:39 UTC
To: "esbnetworks@esb.ie" <esbnetworks@esb.ie>
Subject: 170831a - Scoping Letter

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John Staunton

From: Yvonne Jackson <Yvonne.Jackson@failteireland.ie>
Sent: 15 June 2018 15:09
To: John Staunton
Subject: RE: 170831a - Scoping Letter
Attachments: EIS & Tourism Guidelines.pdf

Hello John,

I wish to acknowledge receipt of your e-mail in relation to the proposed housing development near Oranmore, Co Galway. Sorry for the delay in replying to your e-mail. Please see attached a copy of Fáilte Ireland's Guidelines for the treatment of tourism in an EIS, which we recommend should be taken into account in preparing the EIAR.

Regards,

Yvonne

Yvonne Jackson

Product Development- Environment & Planning Support | Fáilte Ireland

Áras Fáilte, 88/95 Amiens Street, Dublin 1. D01WR86

T +353 (0)1 884 7244 | www.failteireland.ie



Fáilte Ireland
National Tourism Development Authority



From: John Staunton <jstaunton@mccarthykos.ie>
Sent: 01 June 2018 6:17 PM
To: Yvonne Jackson <Yvonne.Jackson@failteireland.ie>
Subject: 170831a - Scoping Letter

Dear Yvonne,

Please find attached a scoping letter for a proposed development near Oranmore, Co. Galway.

Kind regards,

John

John Staunton BSc. (Env); PhD.
Project Environmental Scientist

McCarthy Keville O'Sullivan Ltd.
Planning & Environmental Consultants

Block 1, G.F.S.C. Moneenageisha Road, Galway.

T: (091) 73 56 11 || E: info@mccarthykos.ie || W: www.mccarthykos.ie

Guidelines on the treatment of tourism in an Environmental Impact Statement

1. Introduction

Tourism is a significant component of the Irish Economy – estimated to employ approximately 205,000 people – and contributing €6.6 billion in spending to the economy in 2014. The environment is one of the main resources upon which this activity depends – so it is important that the EIS evaluates whether and how the interacting impacts of a project are likely to affect tourism resources.

The purpose of this short note is to provide guidance on how these impacts can be assessed through the existing EIA process. Undertaking an EIA is governed by the EIA Advice Notes published by the EPA. These Advice Notes contain detailed guidance on how to describe and evaluate the effects arising from a range of projects, including tourism projects.

These guidelines were written with the assistance of Conor Skehan, Head of Department of Environment and Planning, Dublin Institute of Technology.

2. Tourism and the Environment

There are two interactions between tourism and the environment.

1. Impacts caused by Tourism Projects
2. Impacts affecting Tourism (e.g. the quality of a destination or a tourism activity)

Impacts caused by Tourism Projects

Tourism projects can give rise to effects on the environment. These are specifically dealt with under a number of Project Types in the Advice Notes, specifically:

12 TOURISM AND LEISURE

- a. Ski-runs, ski-lifts and cable-cars where the length would exceed 500 metres and associated developments. Project Type 20
- b. Sea water marinas where the number of berths would exceed 300 and fresh water marinas where the number of berths would exceed 100. Project Type 10

- c. Holiday villages which would consist of more than 100 holiday homes outside built-up areas; hotel complexes outside built-up areas which would have an area of 20 hectares or more or an accommodation capacity exceeding 300 bedrooms. Project Type 28
- d. Permanent camp sites and caravan sites where the number of pitches would be greater than 100. Project Type 28
- e. Theme parks occupying an area greater than 5 hectares. Project Type 29

Figure 1 The Advice Notes contain detailed descriptions on how to describe and evaluate the effects arising from a range of tourism projects.

Impacts affecting Tourism

Environmental effects of other projects on tourism are not specifically addressed in the Advice Notes. Taking account of the significance of tourism to the Irish economy a specialist topic of 'Tourism' has been prepared to facilitate a systematic evaluation of effects on this sector within the format laid down for other parts of the Environmental Impact Statement.

It is not intended that the assessment of effects on tourism should become a separate section of the Impact Statement, instead it is intended to become a specialist sub-section of the topic 'Human Beings' which is currently described in Section 2 of the Advice Notes

3. Tourism in the Existing Environment

Introduction

Visitor attitude surveys reveal that the following factors – in order of priority – are the reasons that tourists visit and enjoy Ireland:

- Beautiful scenery
- Friendly & hospitable people
- Safe & Secure
- Easy, relaxed pace of life
- Unspoilt environment
- Nature, wildlife, flora
- Interesting history & culture
- Plenty of things to see and do
- Good range of natural attractions

It is noteworthy that over half of the factors listed are environmental and that all others are related to the way of life of the people. The following describes how these factors are considered within an EIS, set out under EIA topic headings, and how they interact with tourism.

Beautiful scenery

This is covered in the '*Landscape*' Section. Particular attention needs to be paid to effects on views from existing purpose-built tourism facilities, especially hotels, as well as views from touring routes and walking trails. It is important to note that there appears to be evidence that the visitor's expectations of 'beautiful' scenery does not exclude an admiration of new modern developments – such as windfarms – which appear to be seen as indicative of a modern, informed and responsible attitude to the environment.

Friendly & hospitable people

This is not an environmental factor though it is indirectly covered under the '*Human Beings*' section of the EIS. The principal factor is the ratio of visitors to residents. This is of less significance in areas with long-established patterns of tourism.

Safe & Secure

This is not an environmental issue – though some of the factors that are sometimes covered under the heading of '*Human Beings*' – such as social inclusion or poverty – can point to likely effects and interactions.

Easy, relaxed pace of life

This is not an environmental issue though it is partially covered under '*Human Beings*' – see comments above.

Unspoilt environment

This is covered under the sections dealing with '*Landscape*', '*Flora*' and '*Fauna*' and to a lesser extent under emissions to '*Water*' and '*Air*'. In some instances traffic congestion, especially in rural areas, can be an issue, this is usually covered within '*Material Assets*'.

Nature, wildlife, flora

This is principally covered under the headings of '*Flora*' and '*Fauna*' and to a lesser extent by '*Landscape*', '*Water*' and '*Air*'. The principal issues being to avoid any effects that might reduce the health or extent of the habitats. This can occur either directly, by impinging on the site, or indirectly, through emission, that can affect the natural resources, like clean water, which the habitat depends on. It also considers effect on physical access to and visibility of these sites. Occasionally there are concerns about the disturbance or wear and tear of visitor numbers to such sites.

Interesting history & culture

This is principally covered under '*Cultural Heritage*' and, to a lesser extent, under '*Human Beings*'. The principal issues being to avoid damage to sites and structures of cultural, historical, archaeological or architectural significance – and to their contexts or settings. It also considers effect on physical access to and visibility of these sites. Occasionally there are concerns about the wear and tear of visitor numbers to such sites.

Plenty of things to see and do.

This is not an environmental issue though it is partially covered by the '*Human Beings*' section, where the tourism resources of an area are described and assessed.

Good range of natural attractions

This is covered by the '*Landscape*', '*Flora*', '*Fauna*', and '*Cultural Heritage*' sections of the EIS.

4. Project factors affecting Tourism

Introduction

Tourism can be affected both by the structures or emissions of new developments as well as by interactions between new activities and tourism activities – for example the effects of high volumes of heavy goods vehicles passing through hitherto quiet, scenic, rural areas. Tourism can be affected by a number of the characteristics of the new project such as:

- New Developments
 - Social Considerations
 - Land-uses and Activities
- *New Developments* - will the development stimulate or suppress demand for additional tourism development in the area? If so, what type, how much and where? Marinas, golf courses, other major sporting facilities as well as theme parks and larger conference facilities can all stimulate the emergence of new accommodation, catering and leisure facilities often within an extensive area around a new primary visitor facility. Extensive urbanisation and large scale infrastructure as well as certain processing and extractive industries all have the potential to suppress demand for additional tourism – but usually only in the immediate locality of the new development. It should be noted however, that some types of new or improved large scale infrastructure – such as roads – can improve the visitor experience – by increasing safety and comfort or can convey a sense of environmental responsibility – such as wind turbines.
- *Social Consideration* - will the development change patterns and types of activity and land use? Will it affect the demographics, economy or social dynamics of the locality?
- *Land-use* - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the tourism resources in the surrounding area?

Existing Tourism

In the area likely to be affected by the proposed development, the following attributes of tourism, or the resources that sustain tourism, should be described under the following headings.

Note that the detailed description and analysis will usually be covered in the section dealing with the relevant environmental topic – such as '*Landscape*'. Only the relevant finding as to the likely significance to, or effect on, tourism needs to be summarised in this section.

Context

Indicate the location of sensitive neighbouring tourism resources that are likely to be directly affected, and other premises which although located elsewhere, may be the subject of secondary impacts such as alteration of traffic flows or increased urban development. The following should be noted in particular:

- Hotels, conference centres, holiday accommodation – including holiday villages, holiday homes, and caravan parks.
- Visitor centres, Interpretive centres and theme parks
- Golf courses, adventure sport centres and other visitor sporting facilities
- Marinas and boating facilities
- Angling facilities
- Equestrian facilities
- Tourism-related specialist retailers and visitor facilities
- Historic and Cultural Sites
- Pedestrian, cycling, equestrian, vehicular and coach touring routes

Indicate the numbers of premises and visitors likely to be directly affected directly and indirectly.

Identify and quantify, where possible, their potential receptors of impacts, noting in particular transient populations, such as drivers, walkers, seasonal and other non-resident groups.

Describe any significant trends evident in the overall growth or decline of these numbers, or of any changes in the proportion of one type of activity relative to any other.

Indicate any commercial tourism activity which likely to be directly affected, with resultant environmental impacts.

Character

Indicate the occupations, activities or interests of principal types of tourism in the area. – Where relevant, describe the specific environmental resources or attributes in the existing environment which each group uses or values; where relevant, indicate the time, duration or seasonality of any of those activities. For example describe the number of guides, boats and anglers who use a salmon fishery and the duration of the salmon season as well as the quantity and type of local accommodation that is believed to be used by the anglers.

Significance

Indicate the significance of the principal tourism assets or activities likely to be affected. Refer to any existing formal or published designation or recognition of such significance. Where possible provide an estimate of the contribution of such

tourism activities to the local economy. For instance refer to the number of annual visitors to a tourism attraction or to the grading of a hotel.

Sensitivity

Describe any significant concerns, fears or opposition to the development known to exist among tourism interests. Identify, where possible, the particular aspect of the development which is of concern, together with the part of the existing tourism resource which may be threatened. For instance describe the extent of a potential visual intrusion onto a site of historic significance which is the main local tourist attraction.

5. Impacts on Tourism

"Do Nothing" Impact;

Describe how trends evident in the existing environment will continue and how these trends will affect tourism.

Predicted impact;

- Describe the location, type, significance, magnitude/extent of the tourism activities or assets that are likely to be affected.
- Describe how the new development will affect the balance between long-established and new dwellers in an area and its affect on the cultural or linguistic distinctiveness of an area. For example describe the effect of a new multi-national population required for an international call-centre located in a Gaeltacht area.
- Describe how changes in patterns of employment, land use and economic activity arising from the proposed development will affect tourism, for example, illustrating how a new industrial development will diversify local employment opportunities thereby reducing the area's unsustainable over-reliance on seasonal tourism.
- Describe the consequences of change, referring to indirect, secondary and cumulative impacts on tourism; Examples can include describing how the new development may lead to a reduced assimilative capacity for traffic or water during the peak of the tourism season or how new urbanism combined with existing patterns of tourism may lead to unsustainable levels of pedestrian traffic through a sensitive habitat.
- Describe the potential for interaction between changes induced in tourism and other uses that may affect the environment – for instance increasing new tourism-related housing affecting water resources or structures
- Describe the worst case for tourism if all mitigation measures fail.

6. Mitigating adverse impact on Tourism

Describe the mitigation measures proposed to:

- *avoid* sensitive tourism resources – such as views, access, and amenity areas including habitats as well as historical or cultural sites and structures.
- *reduce* the exposure of sensitive resources to excessive environmental burdens arising from the development's emissions or volumes of traffic [pedestrian and vehicular], and/or losses of amenity arising from visually conspicuous elements of the development – for example by prioritizing visual screening of views from a hotel towards a quarry.
- *reduce* the adverse effects to tourism land uses and patterns of activities – especially through interactions arising from significant changes in the intensity of use or contrasts of character or appearance – for example by separating traffic routes for industrial and tourism traffic.
- *remedy* any unavoidable significant residual adverse effects on tourism resources or activities, for example by providing alternative access to tourism amenities – such as waterways or monuments.

John Staunton

From: Info <Info@nationaltransport.ie>
Sent: 01 June 2018 18:20
To: John Staunton
Subject: Automatic reply: 170831a - Scoping Letter

Thank you for your email, it will be reviewed and we will respond to you shortly,

Kind regards,

National Transport Authority

A Chara, Go raibh maith agat as teagmh?il a dh?anamh le Udaras N?isi?nta Iompair.
T? r?n again, gach r-phoist a fhreagairt taobh istigh de c?ig l? oibre.
Le dea-mh?in. Udaras N?isi?nta Iompair

[https://www.transportforireland.ie/email/images/footer_r1_c1.png]<<https://www.transportforireland.ie/available-apps/>>
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[<https://www.transportforireland.ie/email/images/egov-logo.jpg>] <<https://egovawards.org/2016-winners-page/>>
[<https://www.transportforireland.ie/email/images/TFI-Email-Signature2.jpg>]<<https://twitter.com/TFIupdates>>

T? eolas sa teachtaireacht leictreonach seo a d'fh?adfadh bheith pr?obh?ideach n? faoi r?n agus b'fh?idir go mbeadh ?bhar r?nda n? pribhl?ideach ann. Is le h-aghaidh an duine/na ndaoine n? le h-aghaidh an aon?in at? ainmnithe thuas agus le haghaidh an duine/na ndaoine sin amh?in at? an t-eolas. T? cosc ar rochtain don teachtaireacht leictreonach seo do aon duine eile. Murab ionann tusa agus an t? a bhfuil an teachtaireacht ceaptha d? b?odh a fhios agat nach gceada?tear nochtadh, c?ipe?il, scaipeadh n? ?s?id an eolais agus/n? an chomhaid seo agus b'fh?idir d'fh?adfadh bheith m?dhleathach.

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Appendix 2-4

Additional Consultation Responses



Your Ref: ABP-303294-18
Our Ref: 5558441046

An Bord Pleanála,
64 Marlborough Street,
Dublin 1
29/01/2019

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

Dear Sir/ Madam,

**Re: 212no. residential units (156 houses and 56 apartments), a crèche and all associated site works.
Moneyduff, Oranmore, Galway**

Irish Water has received notification of Arlum Ltd.'s request to enter into consultations under Section 5 of the Planning and Development (Housing) and Residential Tenancies Act 2016 in respect of the above mentioned proposed development.

Irish Water has issued a Confirmation of Feasibility for this development for 200 residential units.

The proposed development, as assessed for the Confirmation of Feasibility, is a standard connection, requiring no network or treatment plant upgrades for water or wastewater by either the customer or Irish Water. No third party consents are required for these connections to take place

Therefore, based upon the Confirmation of Feasibility issued by Irish Water, Irish Water confirms that subject to a compliant water and wastewater layout and a valid connection agreement being put in place between Irish Water and the developer, the proposed connection(s) to the Irish Water network(s) can be facilitated.


Maria O'Dwyer
Connections and Developer Services Manager



Your Ref: **ABP-303294-18**
Our Ref: **G Pre00012/2019**
(Please quote in all related correspondence)

29 January 2019

An Bord Pleanála
Strategic Housing Development Unit
64 Marlborough Street
Dublin 1
D01 V902

Re: Request for Pre-SHD application Consultation for planning permission The proposed development will consist of the following:

- 1) Construction of 212 no. residential units comprising:**
- 2) Development of a crèche facility (373 sqm) and associated outdoor play areas and car parking.**
- 3) Provision of new vehicular and pedestrian site access from the North-South Oranmore Distributor Road (the route of which was permitted under An Bord Pleanála Reference PL 07.237219, which was extended under PI Ref 15/1334).**
- 4) Provision of shared communal and private open space, site landscaping, car parking, site services and all associated site development works.**

A chara

On behalf of the Department of Culture, Heritage and the Gaeltacht, I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Nature Conservation

The Department refers to the Board's correspondence of 08/01/19 inviting observations in relation to a pre-application consultation¹ for a proposed Strategic Housing Development (SHD) at Moneyduff and Oranhill, Oranmore, Co. Galway. Reference is also made to the documentation, including the EIAR and NIS (by McCarthy Keville O'Sullivan), which have been supplied.

This submission is made by the Department in its role as a prescribed body under planning legislation and as the authority with overarching responsibility for nature conservation and

¹ Under Section 5 of the Planning and Development (Housing) and Residential Tenancies Act 2016



the nature directives (i.e. the Birds and Habitats Directives). The observations are not exhaustive and are intended to assist the Board in its consideration of the current proposal at pre-application stage. They cover matters relating to nature conservation, European sites, biodiversity and environmental protection, proper planning and sustainable development, and the scope of the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS).

In addition to the observations below, the Board is advised to consider the Department's submission in relation to the original SHD at the site (PL07.301952).

As before, the current proposal entails 212 residential units, a crèche and all associated site development works, and has a similar layout within the same proposed development site.

The proposed SHD site is located on the south-eastern margins of Oranmore in an area that has been subject to progressive development and residential and urban expansion in recent decades (see dates from which European sites were protected below).

Likely significant effects on European sites

The current proposal and other surrounding developments (recently constructed and permitted, but not yet constructed) are located between three European sites, Galway Bay Complex SAC (site code 000268), Cregganna Marsh SPA (site code 004142) and Inner Galway Bay SPA (site code 004031).

Galway Bay Complex SAC has been protected since 1997, and has site specific conservation objectives (version 1.0, dated 16/04/13²). Cregganna Marsh SPA has been protected since 2002, and has generic conservation objectives (dated 21/02/18³). Inner Galway Bay SPA has been protected since 1994, and has site specific conservation objectives⁴ (version 1, 01/05/13). Habitat and species mapping datasets are available in connection with and form part of the site specific conservation objectives. These datasets can be downloaded from www.npws.ie.

The SHD site adjoins part of Galway Bay Complex SAC, a wetland area comprising alkaline fen which grades into other qualifying interest coastal and salt marsh habitats to the west. Further east and north-east, three separate or disjoint parts of the SAC comprise fen areas. The primary concerns are in relation to potential effects of the development, on its own and in combination with other developments (existing and permitted) in this general area, on hydrological regime, peat formation, water quality and vegetation composition, as per the attributes and targets of the conservation objectives for this site. Flood risks, including from coastal flooding and predicted sea level rise, and the need for (future) flood protection measures, may also be a concern in this area and should also be addressed.

² https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000268.pdf

³ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004142.pdf

⁴ https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004031.pdf



The potential in combination effects of disturbance, displacement and habitat fragmentation are also a concern in the case of Otter.

Cregganna Marsh SPA and Inner Galway Bay SPA are located to the south and west of the SHD site, respectively. The former comprises wetlands designated for and utilised by Greenland White-fronted Goose, a wintering Annex I bird species that is highly susceptible to disturbance from human activity. The geese that occur in Cregganna Marsh also utilise Rahasane Turlough SPA (site code 004089); the importance of the former for the geese increases when water levels in the turlough are high, meaning there are interrelationships between these two sites. Inner Galway Bay SPA comprises the bay and fringing coastal wetlands, and has been selected for a variety of Annex I and other migratory waterbirds, and wetlands.

A second key concern arising from the development, on its own and in combination with other plans and developments (existing and permitted) in the general Oranmore area, is the potential for disturbance and displacement of birds and encroachment of the SPAs, including wetlands and their margins. This could arise from increased population, increased recreation and amenity pressure, and the need for infrastructure and services such as roads, cycleways, coastal protection measures and lighting along the coastline and in other open lands in the area.

The assessment in the NIS should be undertaken with respect to the conservation objectives for each of the sites, habitats and species at risk as determined by objective information and analysis, rather than the blanket application of a '15km buffer'. Where relevant, the attributes and targets, and any notes and supporting documents should be taken into account and it should be noted whether the specific conservation objective is 'to maintain' or 'to restore' the favourable conservation condition of the habitat or species in the site concerned. The assessment should be specific to the development in question, and to any potential cumulative or in combination effects which may already exist or could arise. Pressures of increasing amenity and recreational activity, including dog-walking, due to increasing development and population pressure in the area, and progressive losses and fragmentation of open spaces, will require particular attention, noting the potential for increased disturbance in two nearby SPAs in particular.

The scope of the NIS should be such that it contains the necessary scientific evidence, data and analyses to assess the implications of the proposal, on its own and in combination with other plans and projects (existing and permitted) in this general area, for the conservation objectives and integrity of the sites concerned. It is again noted that the NIS presented with this consultation comprises mainly narrative and is lacking scientific examination of evidence and data necessary to conform to the definition of 'NIS'.

Likely significant effects on the environment – biodiversity

The Biodiversity chapter of the EIAR should describe the baseline environment in terms of the habitats and species of flora and fauna present, and/or likely to be affected by the



proposed development, taking any relevant cumulative effects into account. It should be noted that likely significant effects on European sites are also a matter for the EIA.

Surveys should reflect the current baseline but should also take account of changes that have taken place, whether with or without development consents, and with or without environmental or ecological assessments being carried out. For example, when surveyed for NPWS in 2006, the SHD site supported a mosaic of species-rich calcareous heath (including Juniper), calcareous grassland and rocky outcrops, as well as some disturbed ground. Scrub clearance and ground excavations occurred in the past, and there is evidence of past areas of limestone pavement on the site. More recently, substantial excavations (which may have constituted development) were undertaken in connection with archaeological testing. Lower areas fringing the SAC have deeper soils and there are indications of poor drainage and waterlogging.

Where Annex I habitats are present or potentially present, these should be mapped and described, including in terms of vegetation communities present. Among other things, the significance of losses of the Annex I habitat resource (outside a European site) should be evaluated in the context of the national conservation status for that habitat, see, for example, the Habitats Directive Article 17 reports for 2007 and 2013 which are available from <http://www.npws.ie/article-17-reports-0>. Note also that further conservation status assessment reports will become available in 2019. Cumulative effects, including the combined losses of limestone pavement and other rocky calcareous habitats in the wider Oranmore area over recent decades, should also be taken into account.

The EIAR should address any potential effects on rare/protected species. Any necessary surveys should be carried out at the appropriate time(s) of year to determine presence of rare/protected, and the need for and details of any mitigation measures to avoid or reduce any adverse effects on species and their key habitats (i.e. breeding sites and resting places). In particular, there should be surveys of rare/protected plant species (Flora (Protection) Order, 2015), noting the type of habitats present, and species of fauna, including bats, badgers and other mammals (and noting the extent of scrub cover on the site), and birds, including nesting birds.

Proper planning and sustainable development

The extent to which the development and associated biodiversity losses that would occur at the SHD site are consistent with protective objectives and policies of Galway County Development Plan (CDP) and Oranmore Local area Plan (LAP) should be examined in the EIAR:

CDP: Objective NHB 1 – Protected Habitats and Species

CDP: Objective NHB 2 – Biodiversity and Ecological Networks

CDP: Objective NHB 11(b) – Trees, Parkland/Woodland, Stonewalls and Hedgerows

CDP: Policy NHB 1 – Natural Heritage and Biodiversity

CDP: Policy NHB 2 – Non-Designated Sites

LAP: Objective NH 2 – Protected Habitats and Species



You are requested to send further communications to this Department's Development Applications Unit (DAU) at manager.dau@chg.gov.ie (team monitored); if this is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit (DAU)
Department of Culture, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

A handwritten signature in black ink, appearing to read 'Diarmuid Buttimer'. The signature is stylized with large, sweeping loops and is positioned above a horizontal line.

Diarmuid Buttimer
Development Applications Unit



Your Ref: **ABP-303294-18**

Our Ref: **G Pre00012/2019**

(Please quote in all related correspondence)

29 January 2019

An Bord Pleanála
Strategic Housing Development Unit
64 Marlborough Street
Dublin 1
D01 V902

Re: Request for Pre-SHD application Consultation for planning permission The proposed development will consist of the following:

- 1) Construction of 212 no. residential units comprising:**
- 2) Development of a crèche facility (373 sqm) and associated outdoor play areas and car parking.**
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- 4) Provision of shared communal and private open space, site landscaping, car parking, site services and all associated site development works.**

A chara

On behalf of the Department of Culture, Heritage and the Gaeltacht, I refer to correspondence received in connection with the above.

Outlined below are heritage-related observations/recommendations of the Department under the stated heading(s).

Archaeology

It is noted that the proposed development is proximity to the zone of archaeological potential established around the Recorded Monument GA095-084, Castle, which is subject to statutory protection in the Record of Monuments and Places, established under section 12 of the National Monuments (Amendment) Act 1994.

The Department are in receipt of archaeological reports detailing the impact assessment, archaeological test excavation and conservation issues related to the proposed development. The reports have been reviewed. In line with national policy (see sections 3.4. 3.5 and 3.7 of Frameworks and Principles for the Protection of the Archaeological Heritage 1999) our recommendation is set out below.



The Department will have no objection to this development proceeding provided that the following archaeological conditions are included in any grant of any planning permission that may issue;

Conditions

1. The applicant is required to engage a suitably qualified archaeologist to carry out further archaeological works.
2. A buffer area of 20m should be established around Recorded Monument GA095-084. A temporary fencing should be erected to ensure that the buffer area is protected during construction works. There should be no vehicular access to the buffer area and it should not be used for storage purposes or any other activities related to construction.
3. Archaeological features previously uncovered during test excavation should be subject to full excavation. The excavation should be licenced under the National Monuments Acts 1930-2004.
4. Monitoring of ground works should take place in all areas of archaeological potential, at the discretion of the archaeologist.
5. A detailed plan for the proposed conservation works should be drawn up and submitted to the National Monuments Service. No conservation works should be carried out at the Recorded Monument or its buffer area without written approval from the National Monuments Service.

Reason: To ensure the continued preservation (either in situ or by record) of places, caves, sites, features or other objects of archaeological interest.



You are requested to send further communications to this Department's Development Applications Unit (DAU) at manager.dau@chg.gov.ie (team monitored); if this is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit (DAU)
Department of Culture, Heritage and the Gaeltacht
Newtown Road
Wexford
Y35 AP90

Is mise, le meas

A handwritten signature in dark ink, appearing to read 'Diarmuid Buttimer', is written over a horizontal line.

Diarmuid Buttimer
Development Applications Unit

Planning & Environmental Consultants

McCarthy Keville O'Sullivan Ltd.
Block 1, G.F.S.C.
Moneenageisha Road
Galway

Tel: +353 (0) 91 73 56 11
Fax: +353 (0) 91 77 12 79
E-mail: info@mccarthykos.ie
Website: www.mccarthykos.ie



MEETING MINUTES

Project/Reference:	Strategic Housing Development (SHD), Moneyduff, Oranmore (ABP-303294-18)
Time & Date:	27 th February 2019. 11:30 am
Meeting Type:	Stage 3 pre-submission consultation
Location:	NPWS office, Custom House, Galway
Minutes By:	David McNicholas
Issue Date:	27/02/2019
Filename:	181044

Attendance Details

	Individual	Company	Abbreviation
Attendees	David McNicholas	MKO	DMN
	Pat Roberts	MKO	PR
	Padraig Rhatigan	JJ Rhatigan	PRh
	Paul Fitzmaurice	JJ Rhatigan	PF
	Julie Fossitt	NPWS	JF
Apologies			

Circulation: All attendees

Item	Description
1.0	<p>Introductions</p> <p>PRh – Introduced himself and PF and explained the nature of their involvement in the project. He explained that they were interested in attending the meeting in order to gain a better understanding of the items raised in the DAU submission and how they will be addressed in the application.</p> <p>PR introduced himself and explained that the purpose of the meeting was to discuss the items raised in the submission from the Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht dated the 29th January 2019 and to provide details on how they are to be addressed.</p> <p>JF queried aspects of EIA scoping via ABP, including whether ABP had observations on scope of EIA and was aware of the meeting with NPWS, in this SHD pre-application case. JF also queried whether minutes would be produced and supplied to ABP. It was confirmed that agreed minutes would be supplied to ABP.</p> <p>JF noted that the proposal was similar to or the same as the previous application, and asked if any other (third party) submissions had been made in relation to that case, noting that details of submissions are not normally known or publicly available in ABP/SHD cases.</p>

	<p>It was confirmed by PF that the only other submissions in relation to the project were from local residents and did not specifically relate to issues surrounding natural heritage. They were predominantly restricted to issues over traffic, roads and pedestrian crossings.</p> <p>JF noted that although the meeting was to focus on the DAU submission dated 29/01/2019, items raised in previous submissions in relation to the previous application (ABP – 301952 – 18) continue to stand and need to be addressed.</p>
2.0	<p>Consideration of potential disturbance to the Qualifying Interest (QI) or Special Conservation Interests (SCI) species of nearby Special Areas of Conservation (SACs)/Special Protection Areas (SPAs):</p> <p>PR explained that issues relating to disturbance and habitat loss and degradation had been addressed in the application and through further survey works including the following:</p> <ul style="list-style-type: none"> • Monthly bird surveys have been undertaken of the site and nearest parts of the Inner Galway Bay SPA as well as Creganna Marsh SPA throughout the winter of 2018/2019 and are ongoing. These surveys follow an adapted I-WeBS survey methodology. • The site of the proposed development and its immediate surroundings including the adjacent fen do not provide suitable habitat for Qualifying Interest (QI) or Special Conservation Interests (SCI) species for which the nearby Galway Bay Complex SAC, Creganna Marsh SPA or Inner Galway Bay SPA have been designated. • No SCI bird species have been recorded within the site during dedicated bird surveys that have been undertaken between October 2018 and February 2019. No evidence of the site of the proposed development being on any commuting route was recorded. • There is a physical and visual barrier between the proposed development site and Creganna Marsh in the form of existing housing estates. • Dedicated otter surveys have been undertaken both on the site and in the surrounding area with no suitable habitat present on the site and no signs of otter activity recorded in the wider area. • The proposal will not result in any physical loss of habitat for QI/SCI species. • The applicant is developing within lands that have been zoned for development within the Oranmore Local Area Plan 2012 and the County Development Plan, which have been subject to the Appropriate Assessment process (CAAS, 2015)¹. <p>Following these surveys, it is further demonstrated that the site of the proposed development and surrounding lands do not provide significant habitat for QI/SCI species of the nearby SACs/SPAs and that the proposed development will not result in any adverse effects in relation to disturbance of these species. The data obtained from these surveys</p>

¹ CAAS, 2015, Natura Impact Report In Support of the AA of the Galway County Development Plan 2015-2021, Online, Available at: <http://www.galway.ie/en/services/planning/developmentplansandpolicy/galwaycountydevelopmentplan2015-2021/environmentalsupportingdocuments/>, Accessed: 01/03/2019

	<p>will be presented in the Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) presented with the Stage 3 SHD application.</p> <p>In addition, PR explained that a review of all developments in the area surrounding the proposed development since 1994 (when the Inner Galway Bay SPA was designated) has been undertaken and will inform the final cumulative assessment in the EIAR Biodiversity Chapter and NIS. PR confirmed that none of the developments reviewed had encroached onto any designated site. He also confirmed that although, the site of the proposed development was surrounded by existing, proposed and recently constructed developments, no evidence that there was a commuting route for any species through the site was recorded during any of the surveys undertaken. Neither was there any continuity of habitats through the site (i.e. the fen that is within the SAC does not continue through the site of the proposed development and it does not provide a significant link to sensitive habitats in the wider area).</p> <p>JF noted the above in relation to direct and indirect effects on birds in the application area but advised that the NIS needed to focus on matters of relevance, and the European sites and conservation objectives that were realistically at risk from construction and operation of the development, including any ex-situ and cumulative effects or pressures that might result, e.g. increased disturbance and amenity and recreational pressures, pressures on water and wastewater services, road infrastructure and other facilities etc. resulting from increased housing, population and development in the wider Oranmore area. JF said the definition of NIS should be checked as the NIS is required to include scientific examination of evidence and data necessary to identify and classify and implications for conservation objectives of sites, and noted that these are broader than QIs or SCIs alone. JF said the key concerns in relation to potential effects on European sites were outlined in the Department's latest submission and advised that these needed to be addressed in the NIS. She referenced the standards of the AA process that would have to be reached on the basis of the NIS submitted. JF mentioned Scottish Natural Heritage (SNH) guidelines in relation to addressing recreational pressures on SACs/SPAs.</p> <p>PR said that the proposed development did not provide any direct or indirect access to any SAC or SPA and that the development was located on zoned land and fully in accordance with the provisions of the Oranmore Local Area Plan 2012, Galway County Development Plan 2015-2021 and its Core Strategy. These plans were the subject of Appropriate Assessment in their own right (CAAS, 2015 – *note consultants prepare reports, AA competent authorities carry out AA).</p> <p>PR stated that he was not aware of the Scottish Natural Heritage Guidance that was referenced by JF but will use it in the completion of an assessment of the ex-situ impacts on SACs/SPAs as a result of recreational activity.</p> <p>PF added that the proposal is required to have 15% of the developable areas as amenity and recreational areas and that the proposal has been designed to have this, including an additional 14.3% of open space. This provides adequate provision for recreation and amenity within the site, without impacting on the surrounding SAC/SPA.</p>
3.0	<p>Consideration of potential Hydrological and Hydrogeological effects on nearby SACs/SPAs</p> <p>JF said that the NIS should contain all scientific information relating to how the effects were analysed and assessed, including cumulative effects on groundwater dependent receptors in the SAC. She explained that if key potential effects were hydrological/hydrogeological effects on fen habitats (including an assessment of their structure and function as well as the relevant conservation objectives), this should form part of the NIS.</p>

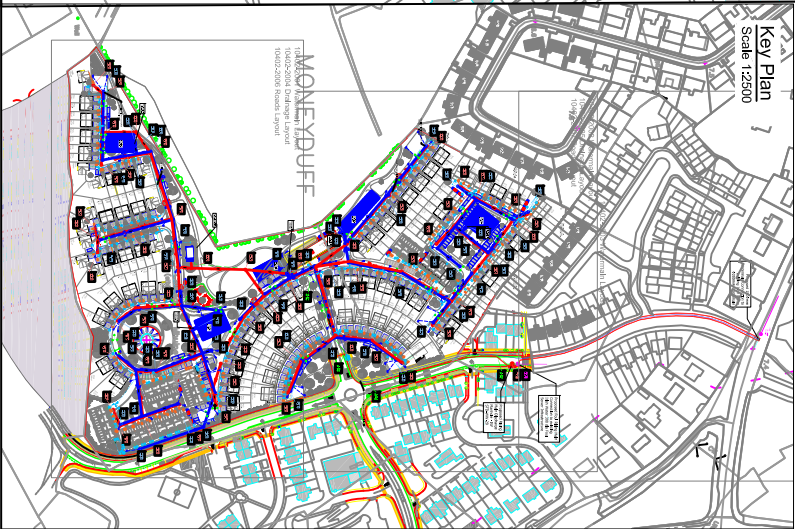
	<p>Will the development, alone or in combination with other constructed and permitted developments, affect or impede groundwater flow to/from the fen habitat in the SAC to the east, or affect fen hydrology? The attributes and targets of the site-specific conservation objectives, and the requirements of the habitat, should be checked and will guide the detail of the assessment required. These matters will guide the content of the NIS.</p> <p>PR stated that all relevant information/data from the hydrological assessment of the site on the Sustainable Drainage Design (SuDS) and the Flood Risk Assessment was considered in the assessment of the hydrological/hydrogeological impacts on the designated sites. All this information is available in the EIAR Biodiversity and Hydrology/Hydrogeology chapters and associated appendices. This information confirms that the proposed development will have no effect on downstream SAC/SPA and was cross referenced in the NIS. However, in light of the DAU submission, the NIS will be updated to include this information to provide the scientific reasoning within the document itself. The NIS will address all other issues raised in the DAU submission.</p> <p>PR agreed to update the Hydrogeological assessment to address this issue</p>
4.0	<p>Biodiversity:</p> <p>PR explained that whilst the site may have contained high quality Annex I habitats in the past, it was assessed on the basis of the habitats that currently exist on the site and that the current owner was not responsible for any previous works undertaken on the site.</p> <p>JF noted that Annex I habitats do occur on the site, as established by the various surveys, including those of MCKOS. JF noted that excavations were undertaken (in connection with archaeological investigations) on the site and may have been development which required planning permission, noting the range of restrictions on exemptions that could have applied. Various types of ground excavations and testing are classes of exempted development.</p> <p>PF – An archaeological Licence was granted from the Department following consultation. JF outlined that the granting of such a licence does not negate any planning requirements that might arise. The client not aware of any requirement for planning permission for such exploration works and was not advised by any party that such permission was required.</p> <p>PR explained that site has been the subject of detailed habitat surveys and mapping. Isolated areas of Annex I calcareous grassland were recorded on the site and have been mapped. The site is currently subject to low intensity grazing and is in the process of being engulfed by scrub and rank grassland. The area of Annex I habitat within the site is decreasing as a result of scrub encroachment and this trend is likely to continue.</p> <p>PR confirmed that the proposed development has provided for the retention and ongoing management of almost 0.71 hectare Annex I calcareous grassland within the site and forming a strip along the boundary with the SAC to the west and north. A Habitat Management Plan has been included within the application? and has defined roles and responsibilities for the implementation of the plan and monitoring of the results. The plan also provides for the enhancement of general biodiversity on the site with the retention and enhancement of hedgerows and treelines.</p> <p>PR confirmed that mammal surveys of the site have been undertaken and details are provided within the EIAR including all dedicated badger and otter surveys. Bat surveys were not required as the site does not support any suitable roosting features and is not considered to provide a significant area of suitable foraging habitat. In addition, no obvious potential for the site to be a significant commuting route was identified.</p>

	<p>JF questioned the lack of data on bats and the lack of surveys to establish usage of the site by bats, noting that PR confirmed that bats used and overflowed the site. JF raised the issue of the site being a potential ecological corridor, and noted the extent of cumulative habitat loss and fragmentation in the area. JF said that bat surveys were required to establish the baseline ecological environment.</p> <p>Post meeting it has been decided to undertake nighttime bat detector surveys of the site in advance of submission.</p> <p>JF stated that there is a need to address and assess the cumulative effects that could result or which may already exist.</p> <p>PR confirmed that the proposed development has been designed to comply with the various plans and policies referenced in the DAU submission. JF advised reviewing the proposal in the context of consistency or compliance with the protective nature conservation objectives and policies in these plans, noting that these are matters for consideration in relation to proper planning and sustainable development of an area.</p> <p>JF suggested reviewing the recent EU Commission Guidelines on EIAR, in particular the checklists of the project description to ensure all items have been addressed.</p>
5.0	<p>Closing</p> <p>PR asked if there were any other issues that JF wanted to discuss.</p> <p>JF said no.</p>

END

Appendix 3-1

Drawings



LEGEND

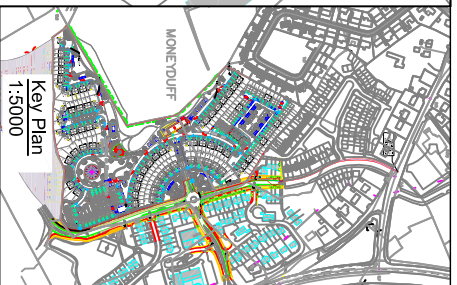
- Proposed Foul Sewer and Manhole
- Proposed Storm Sewer and Manhole
- Proposed Filling Main Water Post
- Proposed Road Gully Location and 6700mm Connection
- Proposed Sidewalk Location
- Proposed Foul Sewer Connection and Inspection Chamber
- Proposed Filling Main
- Proposed Pumping Station
- Proposed Wastewater
- Existing Foul Sewer and Manhole
- Proposed Level
- Proposed Site Boundary/Wall/Window
- Proposed 25mm House Connections

NOTES:

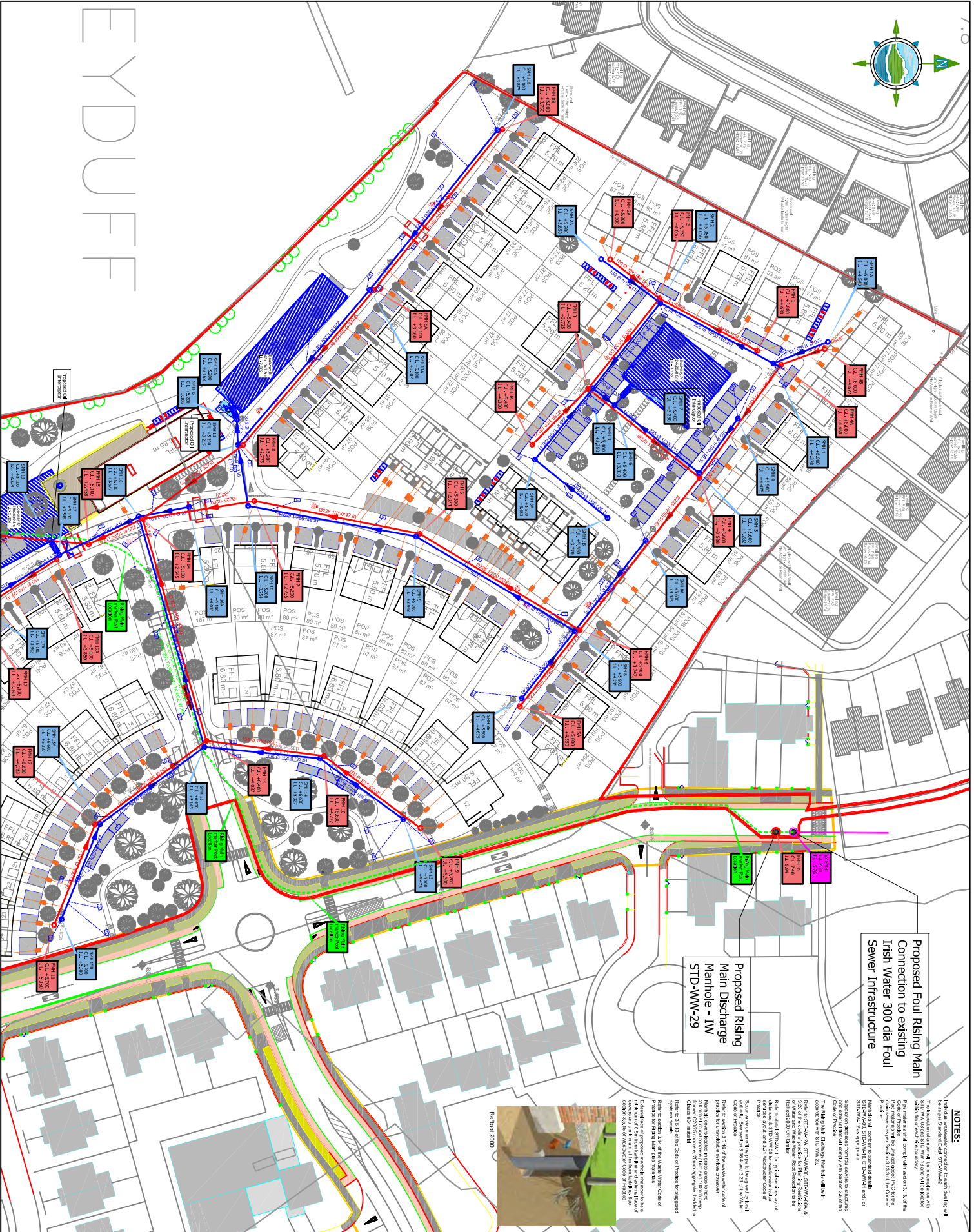
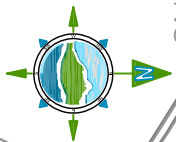
1. DIMENSIONED DIMENSIONS ONLY TO BE TAKEN FROM THIS PLAN.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/OWNER REPRESENTATIVE AS CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERGO A THROUGH

[illegible]

Client: ARLUM LTD.	
Project: Residential Development Monyduff, Oranmore Co. Galway	
Title: Proposed Drainage and Watermain Key Plan	
Scale @ A1: As Shown	Drawn by: Checked:
UK	BR
Project Director: Michael McDonnell	Date: January 2018
Drawing Status: Planning	
 <p>TOBIN ENGINEERS & ARCHITECTS</p> <p>TOBIN Consulting Engineers, Faldrum House, Faldrum Road, Galway, Ireland Tel: +353-91-5665211 Fax: +353-91-5665589 e-mail: galway@tobin.ie www.tobin.ie</p>	
<p><small>Warning: This drawing is the property of TOBIN ENGINEERS & ARCHITECTS. It is to be used for the project and purpose only for which it was prepared. It is not to be used for any other project or purpose without the written consent of TOBIN ENGINEERS & ARCHITECTS. It is to be kept secure and not to be loaned, copied, reproduced or otherwise disclosed to any third party without the written consent of TOBIN ENGINEERS & ARCHITECTS. It is to be destroyed when no longer required for the project and purpose for which it was prepared.</small></p>	
Drawing No.: 10402-000	Revision: E

[illegible]

Client: ARLUM LTD.	
Project: Residential Development Monyduff, Oranmore Co. Galway	
Title: Proposed Walemain Layout Part 2	
Scale @ A1: 1:500	
Drawn by: JK	Checked: BR
Project Status: Planning	Date: January 2018
 <p>TOBIN CONSULTING ENGINEERS</p> <p>Tobin Consulting Engineers, Faldrum House, Faldrum Road, Galway, Ireland Tel: +353-91-8665211 Fax: +353-91-8665888 e-mail: galway@tobin.ie www.tobin.ie</p>	
Drawing No.: 10402-002	Revision: C



Proposed Foul Rising Main Connection to existing Irish Water 300 dia Foul Sewer Infrastructure

Proposed Rising Main Discharge Manhole - 1W STD-WW-29

NOTES:

- 1. All foul rising main connections to existing foul rising main shall be made in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 2. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 3. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 4. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 5. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 6. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 7. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 8. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 9. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 10. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.

LEGEND

- Proposed Foul Sewer and Manhole
- Proposed Storm Sewer and Manhole
- Proposed Pumping Station
- Proposed Foul Rising Main
- Proposed Foul Sewer Connection and Inspection Chamber
- Proposed Pumping Station
- Existing Foul Sewer and Manhole
- Proposed Level

NOTES:

- 1. Foul rising main connections to existing foul rising main shall be made in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 2. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 3. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 4. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 5. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 6. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 7. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 8. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 9. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.
- 10. The foul rising main shall be constructed in accordance with the Irish Water Foul Sewerage Regulations 2007.

Client: **ARLUM LTD.**

Project: **Residential Development Moneyduff, Oranmore Co. Galway**

Title: **Proposed Drainage Layout Part 2**

Scale: A1: 1:500

Prepared by: **JK** Date: **January 2018**

Checked by: **BR**

Project Director: **Michael McDermott**

Drawing Status: **Planning**

TOBIN
Tobin Consulting Engineers,
Galway, Ireland
Tel: +353-091-566211
Fax: +353-091-566288
www.tobin.ie

Drawing No.: **10402-2005** Revision: **C**

LEGEND

Proposed Road Gully Location

Proposed Level

Proposed Direction of Road Fall

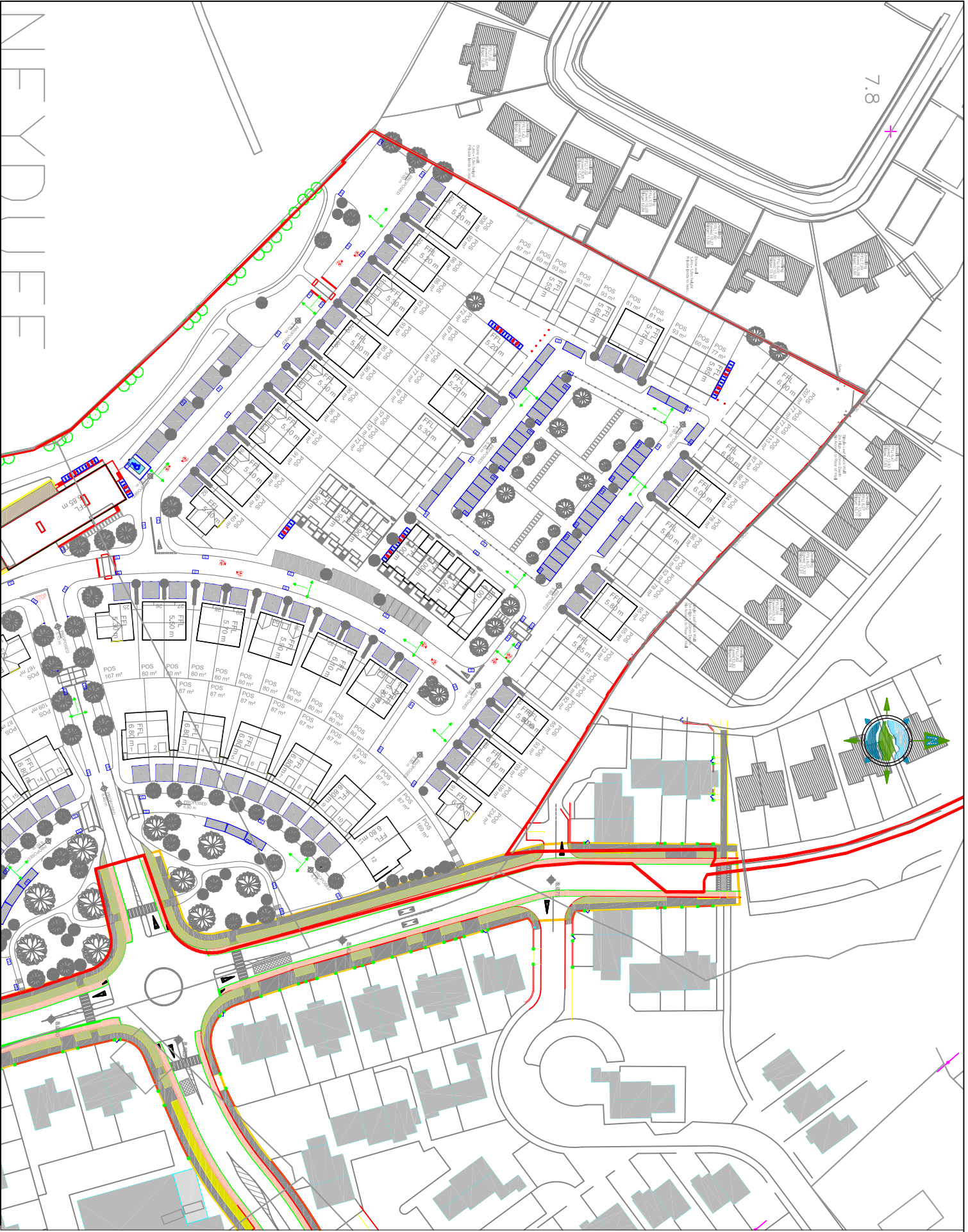


- NOTES:**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 2. ON SITE DIMENSIONS TO BE CHECKED BY THE CONTRACTOR.
 3. APPROPRIATE TO BE INFORMED BY THE CONTRACTOR COMMENCES BEFORE ANY WORK COMMENCES.
 4. THE CONTRACTOR SHALL UNDERGO A THOROUGH SURVEY OF THE SITE AND AROUND THE SITE BEFORE ANY WORK COMMENCES.
 5. ALL LEVELS SHOWN RELATIVE TO ORDNANCE SURVEY DATUM AT 1929.

Rev	Date	Description	By	Chkd
A	20/06/2019	Issues for Planning	JK	BR
B	27/02/19	Issue for Planning	JK	BR
C	07/03/19	Final Architect Layout (After Feedback)	JK	BR

Client:	ARLUM LTD.	Prepared by:	JK
Project:	Residential Development Mooneyduff, Oranmore Co. Galway	Checked:	BR
Date:	January 2018	Project Director:	Michael McDonnell
Title:	Proposed Roads Layout Part 1	Drawing Status:	Planning
Scale:	@ A1:	Drawing No.:	10402-2006
Revision:	C		

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Fairgreen House, Fairgreen Road,
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Email: info@tobin.ie
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7.8



LEGEND

- Proposed Road Gully Location
- Proposed Level
- Proposed Direction of Road Fall

NOTES:

1. DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYER'S REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY VARIATIONS TO THE WORK.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH SURVEY OF THE SITE PRIOR TO COMMENCING ANY WORK.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MSL (1950).

Rev	Date	Description	By	Check
0	07.03.18	Final Approved Layout (After Revision)	JK	BR
1	21.02.18	1st Issue (After Revision)	JK	BR
2	20.02.18	2nd Issue (After Revision)	JK	BR

Client: ARLUM LTD.

Project: Residential Development
Moneyduff, Oranmore
Co. Galway

Title: Proposed Roads Layout
Part 2

Scale @ A1: 1:500
Prepared By: JK
Check: BR
Date: January 2018

Project Director: Michael McDonnell
Drawing Status: Planning
Tobin Consulting Engineers,
Galway, Ireland
Tel: +353-091-566211
Fax: +353-091-566598
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Drawing No.: 10402-2007
Revision: C

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. REPRESENTATIVE AS APPROPRIATE TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES
4. BEFORE ANY WORK COMMENCES
5. THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES
6. SURVEY DRAWN AT MAIN HEAD
7. ALL LEVELS SHOWN RELATIVE TO ORDNANCE
8. APPROVAL

Rev	Date	Description	By	Check
A	20.06.2018	Issue for Planning	JK	BR

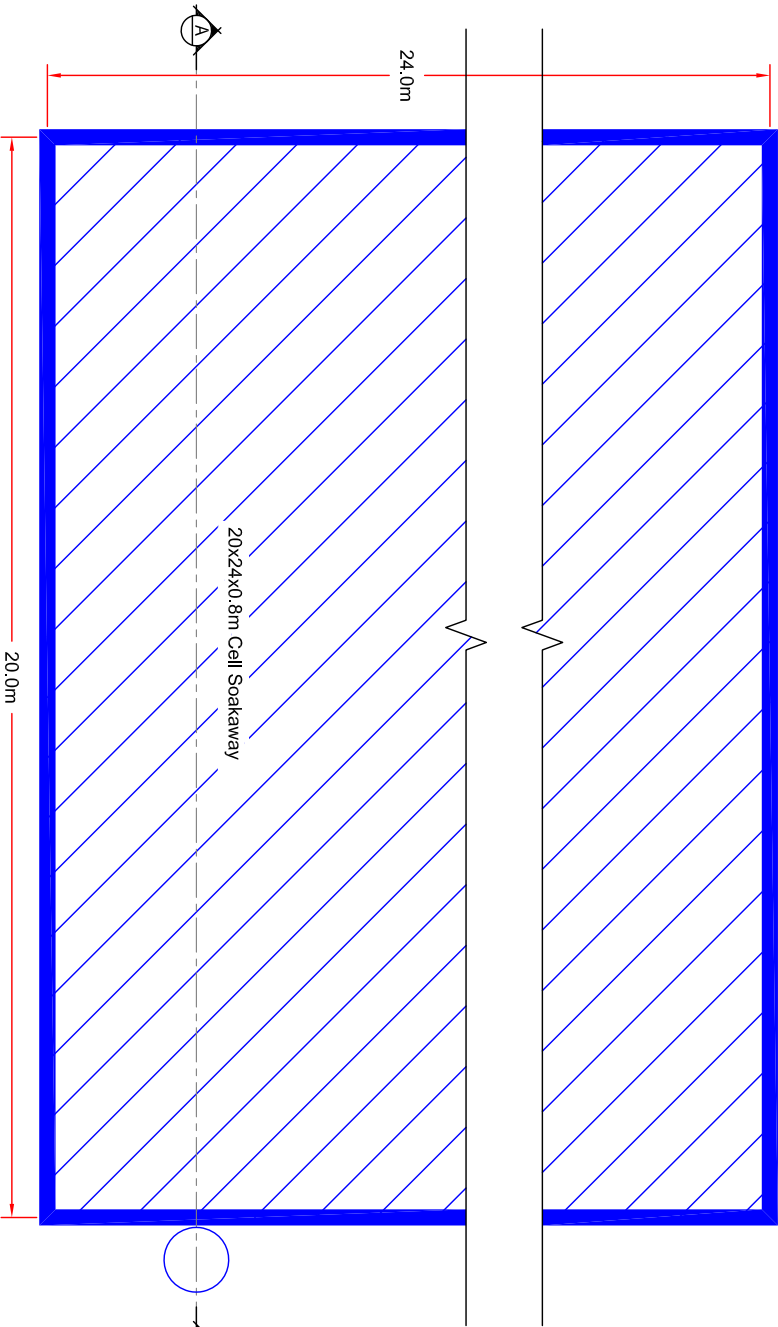
Client: ARLUM LTD.

Project: Residential Development
Moneyduff, Oranmore
Co. Galway

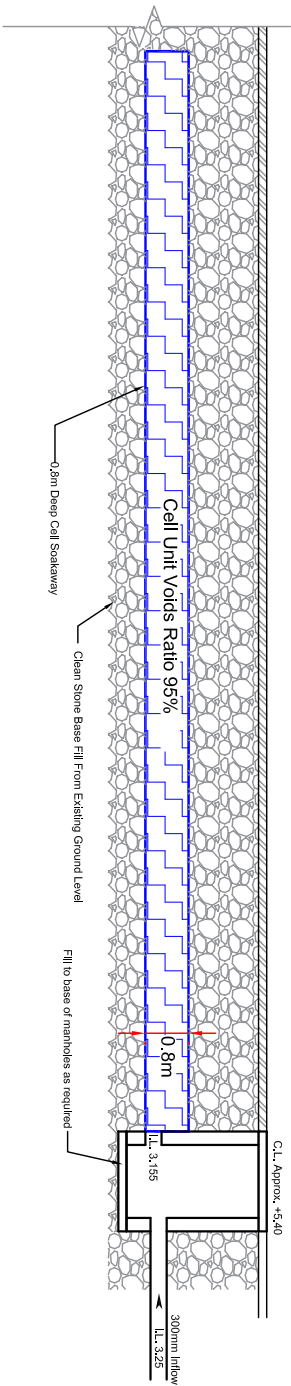
Title: Typical Plan & Section of
Soakaway A

Scale @ A1: 1:50 @A3: 1:100
Prepared By: JK
Checked: BR
Date: January 2018
Project Director: Michael McDonnell
Drawing Status: Planning

TOBIN
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Galway, Ireland.
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Fax: +353-9091-563368
e-mail: galway@tobin.ie
www.tobin.ie



Soakaway 'A' Plan
Scale 1:100



Soakaway 'A' Section A-A
Scale 1:100

- NOTES:
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
 3. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES.
 4. BEFORE ANY WORK COMMENCES, THE CONTRACTOR SHALL OBTAIN A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES.
 5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MAIN HEAD.
 6. APPROVAL

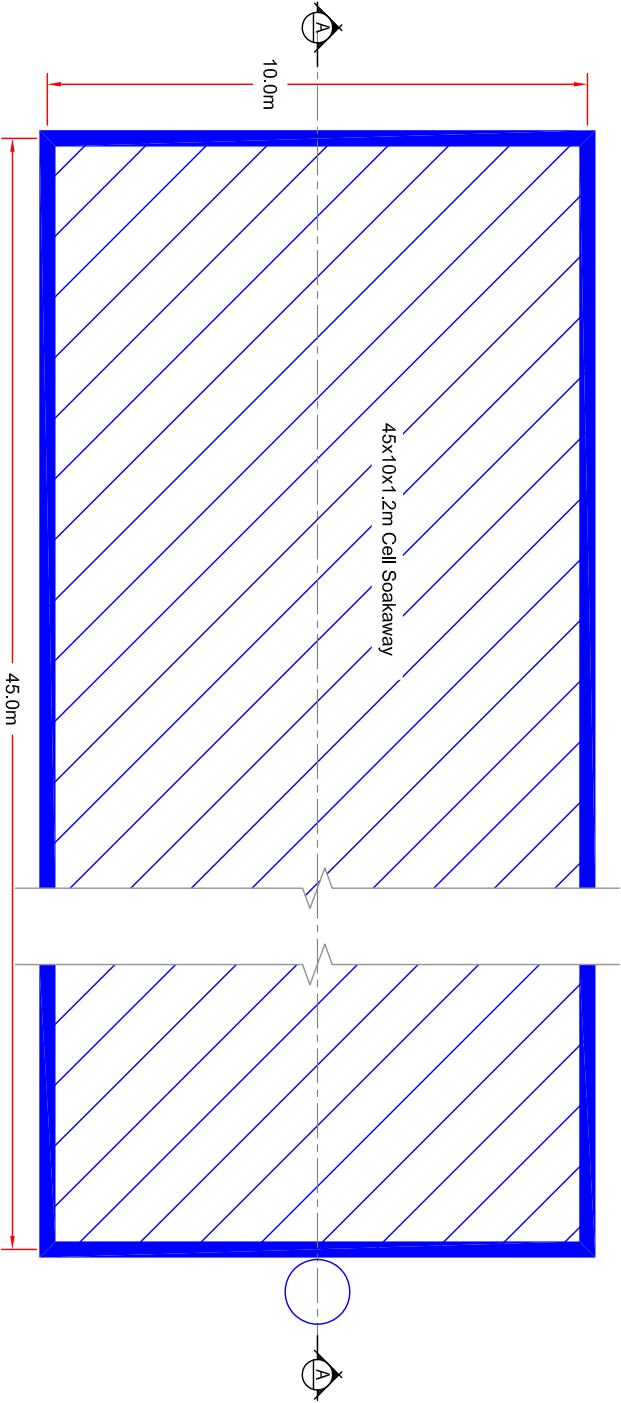
B	22.03.18	Final Approved Layout (Before Installation)	JK	BR	
A	20.06.2018	Issue for Planning	JK	BR	
Rev	Date	Description	By	Check	

Client: ARLUM LTD.

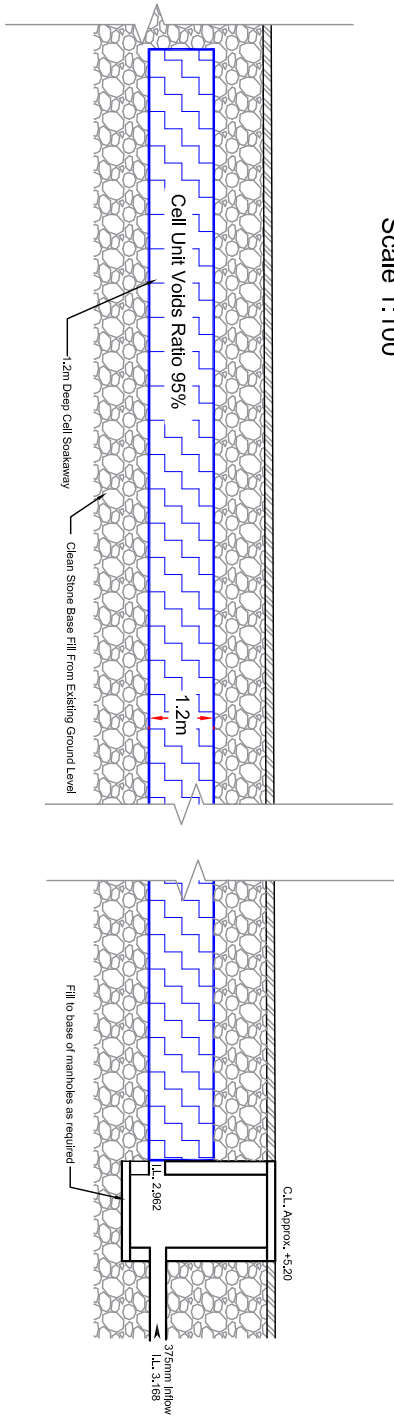
Project: Residential Development
Moneyduff, Orammore
Co. Galway

Title: Typical Plan & Section of
Soakaway B

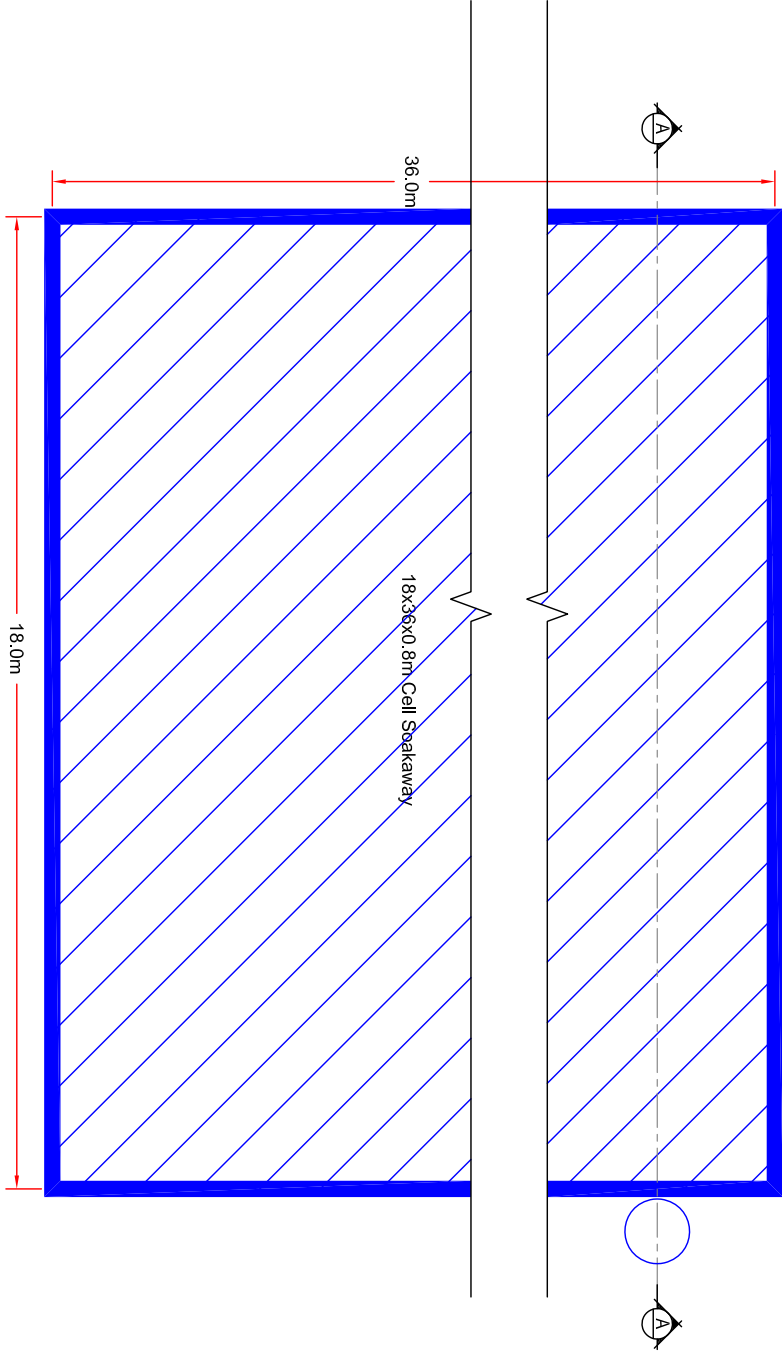
Scale @ A1: 1:50 @A3: 1:100
Prepared By: JK
Checked: BR
Project Director: Michael McDonnell
Drawing Status: Planning



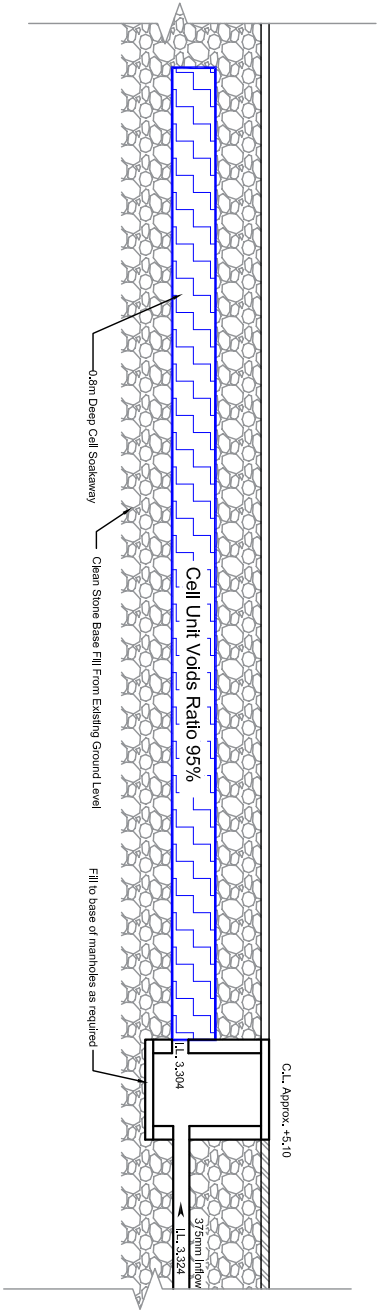
Soakaway 'B' Plan
Scale 1:100



Soakaway 'B' Section A-A
Scale 1:100



Soakway 'C' Plan
Scale 1:100



Soakway 'C' Section A-A
Scale 1:100

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. APPROPRIATE TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES
4. BEFORE ANY WORK COMMENCES
5. LOCATION OF ALL SERVICES/UTILITIES
6. THOROUGH CHECK FOR THE ACTUAL
7. WORK COMMENCES
8. ALL LEVELS SHOWN RELATIVE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
9. APPROVAL

Rev	Date	Description	By	Check
A	20.06.2018	Issue for Planning	JK	BR

Client: **ARLUM LTD.**

Project: **Residential Development
Moneyduff, Oramore
Co. Galway**

Title: **Typical Plan & Section of
Soakway C**

Scale @ A1: **1:50 @A3: 1:100**
Prepared By: **JK** Date: **January 2018**
Project Director: **Michael McDonnell**
Drawing Status: **Planning**

TOBIN
TOBIN CONSULTANTS
Galway, Ireland
Tel: +353-91-466398
Fax: +353-91-466398
e-mail: galway@tobin.ie
www.tobin.ie

Drawing No: **10402-2010 A** Revision:

- NOTES:**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. APPROPRIATE TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES
 4. BEFORE ANY WORK COMMENCES THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES
 5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
 6. APPROVAL

Rev	Date	Description	By	Check
A	20.06.2018	Issue for Planning	JK	BR

Client: ARLUM LTD.

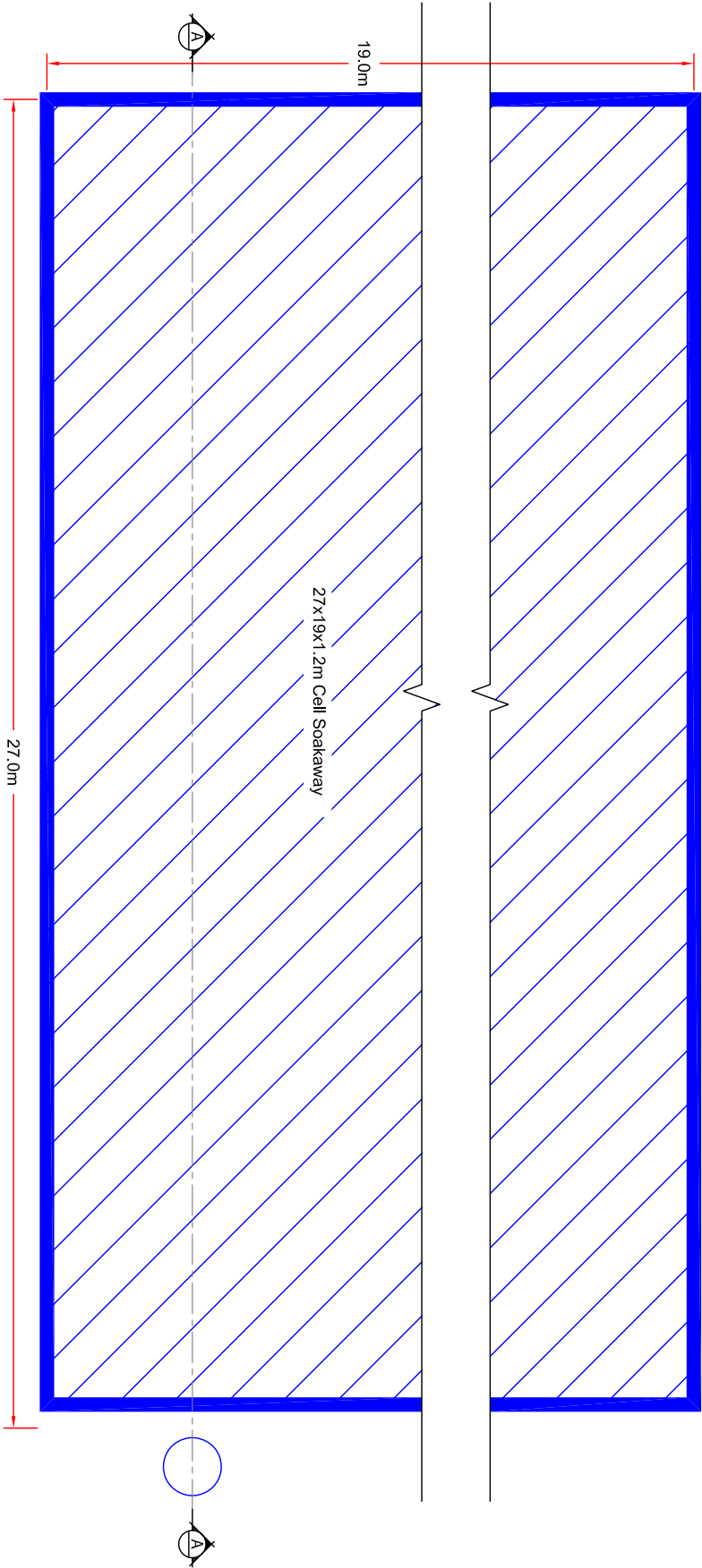
Project: Residential Development
Moneyduff, Oranmore
Co. Galway

Title: Typical Plan & Section of
Soakaway D

Scale @ A1: 1:50 @A3: 1:100
Prepared By: JK
Checked: BR
Project Director: Michael McDonnell
Drawing Status: Planning
Date: January 2018

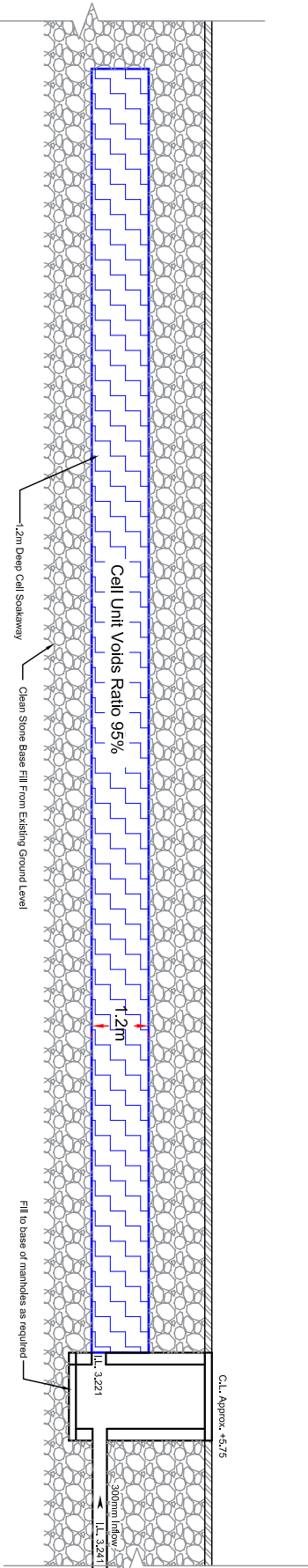
TOBIN
Engineering & Construction Ltd.
Galway, Ireland
Tel: +353-9091-663274
Fax: +353-9091-663368
e-mail: galway@tobin.ie
www.tobin.ie

Drawing No.: 10402-2011 A



Soakaway 'D' Plan

Scale 1:100



Soakaway 'D' Section A-A

Scale 1:100

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. REPRESENTATIVE AS APPROPRIATE TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES
4. BEFORE ANY WORK COMMENCES, THE CONTRACTOR SHALL OBTAIN A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MAIN HEAD
6. APPROVAL

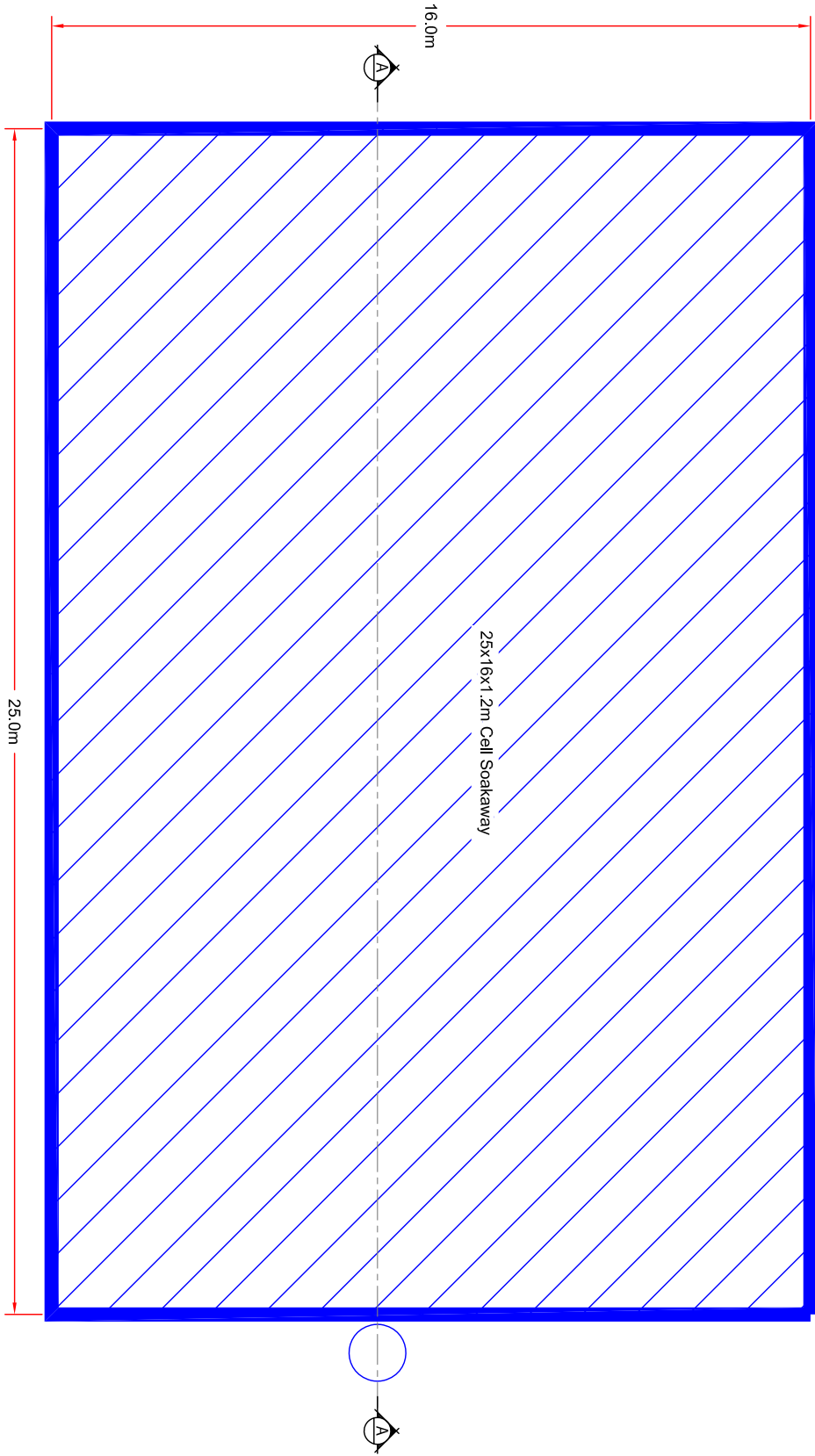
Rev	Date	Description	By	Chk
A	20.06.2018	Issue for Planning	JK	BR

Client: ARLUM LTD.

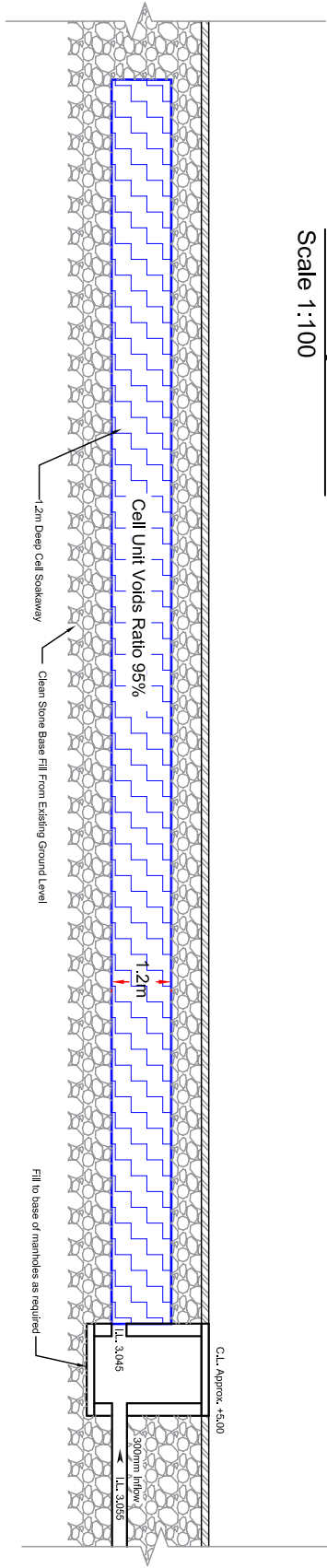
Project: Residential Development
Moneyduff, Orammore
Co. Galway

Title: Typical Plan & Section of
Soakaway E

Scale @ A1: 1:50 @A3: 1:100	Prepared By: JK	Checked: BR	Date: January 2018
	Project Director: Michael McDonnell	Drawing Status: Planning	



Soakaway 'E' Plan
Scale 1:100



Soakaway 'E' Section A-A
Scale 1:100

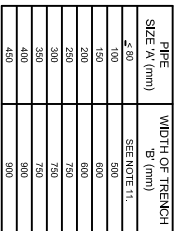
1. FIGURED DIMENSIONS ONLY, TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/ATOR'S REPRESENTATIVE, AS CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERNEAVE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES UTILITIES ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHALL BE MADE TO CORRESPOND TO THE FINISHED LEVELS SHOWN ON THE DRAWING.
6. FINISHED LEVELS SUBJECT TO ARCHITECTS APPROVAL.

Client:	ARLUM LTD.
Project:	Residential Development Moneyduff, Oranmore Co. Galway

Scale @ A1:	1:50	@A3: 1:100
Prepared by:	Checked:	Date:
JK	BR	March 2018
Project Director:	Mitchael McDonnell	
Drawing Status:	Planning	

TOBIN Consulting Engineers,
Fairgreen House, Fairgreen Road,
Galway, Ireland.
tel: +353-(0)91-565211
fax: +353-(0)91-565398
e-mail: galway@tobin.ie

Drawing No.: 10402-2013 Revision: B



FLANGED TEE PIECE

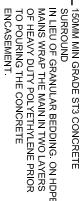
DOUBLE FLANGED DISTANCES

DOUBLE FLANGED DISTANCES

SV

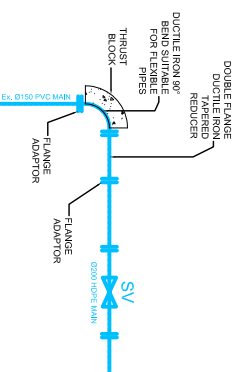
SV

UNDER LANDSCAPED AREAS
SCALE 1:20



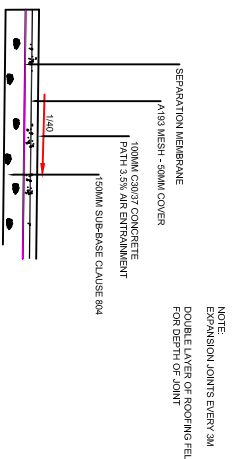
CONCRETE ENCASUREMENT DETAIL WHERE MIN. COVER NOT PROVIDED

PROVIDED WHERE COVER TO PIPES: < 1.2m IN ROADS
OR PIPES UNDER BUILDINGS: <0.9m IN GARDENS/GRASSED AREAS



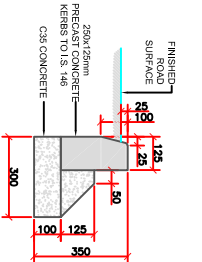
BOUNDARY BOX

**SCHEMATIC OF EX. PVC MAIN CONNECTION TO
NEW HDPE MAIN**



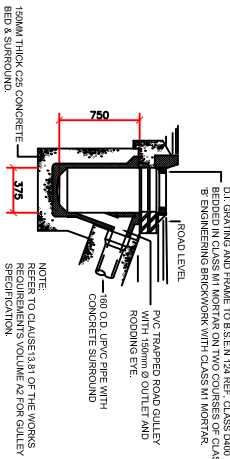
TYPICAL ROAD SECTION
SCALE 1:25

TYPICAL CONCRETE FOOTPATH DETAIL
SCALE 1:20



ROAD KERB SECTION
SCALE 1:10

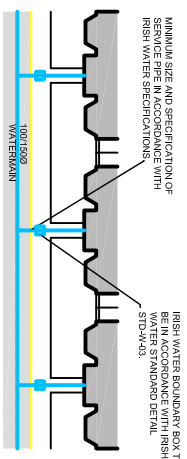
DROP KERB SECTION



TYPICAL ROAD GULLEY DETAIL

**SCHEMATIC OF PROPOSED MAIN CONNECTION
TO EXISTING WATERMAIN**

TYPICAL WATER CONNECTION TO INDIVIDUAL UNITS
SCALE 1:200



- [illegible]

- [illegible]

- [illegible]

1. **STOCKPOILING** - Stockpiling shall be defined as the storage of any material, equipment, or supplies in excess of the amount needed for the project. Stockpiling shall be limited to a maximum of 100 cubic yards of material, equipment, or supplies. Stockpiling shall be located in an area that is not visible from the right-of-way and shall be protected by a stockpile fence. Stockpiling shall be subject to inspection by the Department of Public Works.
2. **STOCKPILE FENCE** - A stockpile fence shall be defined as a fence that is at least 4 feet high and is constructed of a material that is not easily damaged. The fence shall be painted white and shall have a reflective strip on the top edge. The fence shall be located around the perimeter of the stockpile and shall be maintained in good condition at all times.
3. **STOCKPILE INSPECTION** - The Department of Public Works shall conduct inspections of stockpiles on a regular basis. The inspections shall be conducted at least once per month and shall be documented in a stockpile inspection log. The log shall include the date of the inspection, the name of the inspector, and the results of the inspection.
4. **STOCKPILE REMOVAL** - Any stockpile that is found to be in violation of the stockpiling ordinance shall be subject to removal. The Department of Public Works shall issue a notice of violation to the owner of the stockpile and shall give the owner a reasonable amount of time to remove the stockpile. If the stockpile is not removed within the specified time frame, the Department of Public Works shall remove the stockpile at the owner's expense.
5. **STOCKPILE MAINTENANCE** - The owner of a stockpile shall be responsible for the maintenance of the stockpile. The owner shall ensure that the stockpile is kept in good condition and that the stockpile fence is maintained in good condition. The owner shall also be responsible for the removal of any debris or waste from the stockpile.
6. **STOCKPILE STORAGE** - Stockpiles shall be stored in a manner that does not create a safety hazard. The stockpiles shall be stored in a way that allows for easy access and egress. The stockpiles shall be stored in a way that does not obstruct the view of the road or the path of pedestrians.
7. **STOCKPILE SECURITY** - The owner of a stockpile shall be responsible for the security of the stockpile. The owner shall ensure that the stockpile is protected from theft and vandalism. The owner shall also be responsible for the security of the stockpile fence.
8. **STOCKPILE DISPOSAL** - Any material that is removed from a stockpile shall be disposed of in a proper manner. The material shall not be disposed of in a way that creates a safety hazard or an environmental hazard. The material shall be disposed of in a way that is consistent with local, state, and federal regulations.
9. **STOCKPILE VIOLATIONS** - Any violation of the stockpiling ordinance shall be subject to a fine. The fine shall be determined by the Department of Public Works and shall be based on the severity of the violation. The fine shall be payable to the City of [City Name].
10. **STOCKPILE ORDINANCE** - This ordinance shall be enforced by the Department of Public Works. The Department of Public Works shall have the authority to issue notices of violation, to remove stockpiles, and to impose fines. The Department of Public Works shall also have the authority to enforce any other provisions of this ordinance.

- [illegible]

- PRESSURE REDUCING/SIZING VALVE CHAMBER**
38. REFER TO RISH WATER STUD-24 FOR CONSTRUCTION DETAILS.
- BOOSTER PUMP STATION ARRANGEMENT**
39. REFER TO RISH WATER STUD-26 FOR CONSTRUCTION DETAILS.
- METER CHAMBERS**
40. REFER TO RISH WATER STUD-28 FOR CONSTRUCTION DETAILS. METER SPECIFICATION TO BE SUBMITTED BY BIDDER.
- RISH WATER APPROVAL**
41. REFER TO RISH WATER STUD-28 FOR CONSTRUCTION DETAILS.
- TREATMENT AND SUPPORT BLOCKS**
42. REFER TO RISH WATER STUD-29 FOR CONSTRUCTION DETAILS.

1. FLOURED DIMENSIONS ONLY, TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYERS REPRESENTATIVE, APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR, OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MAIN HEAD

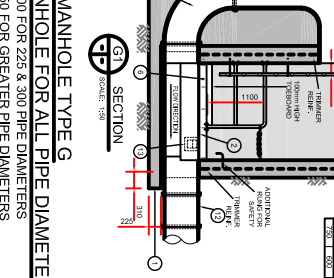
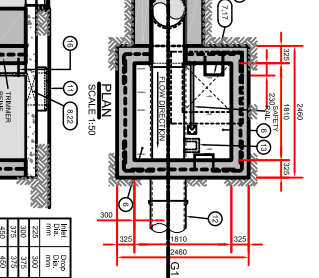
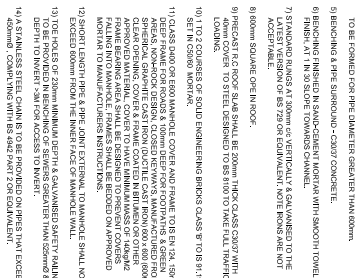
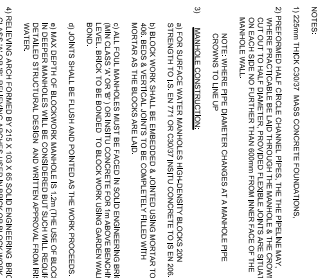
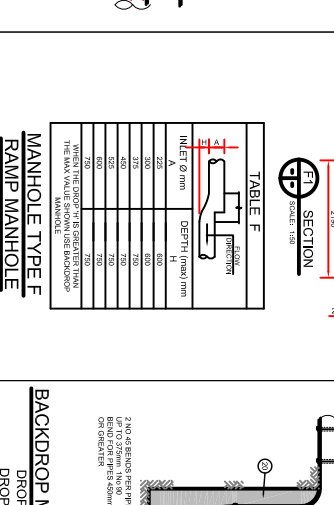
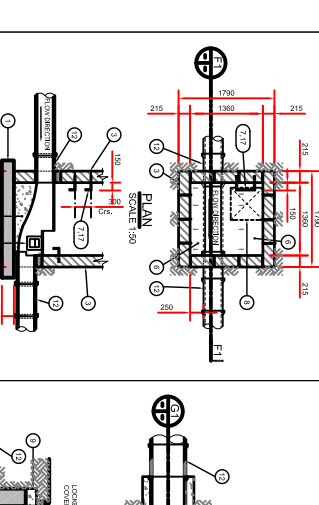
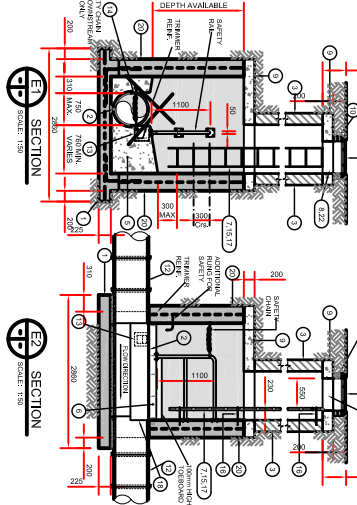
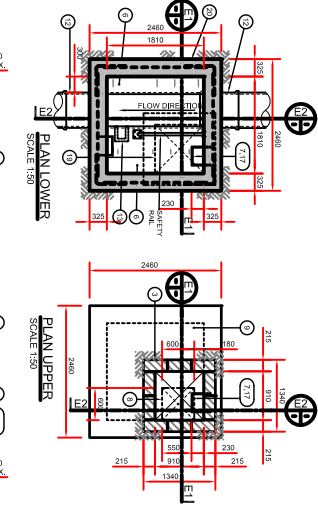
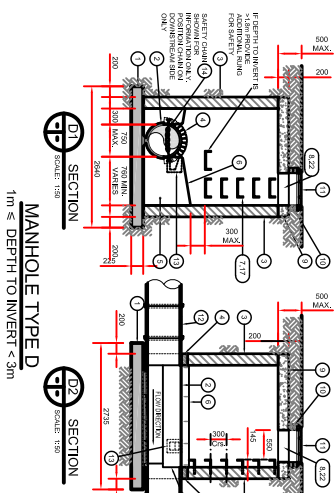
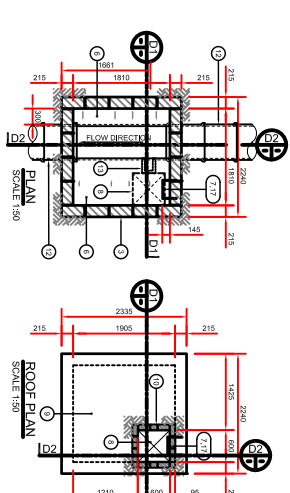
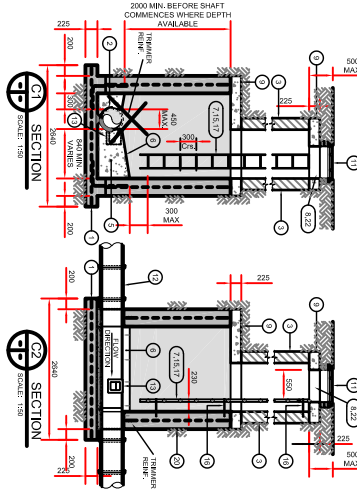
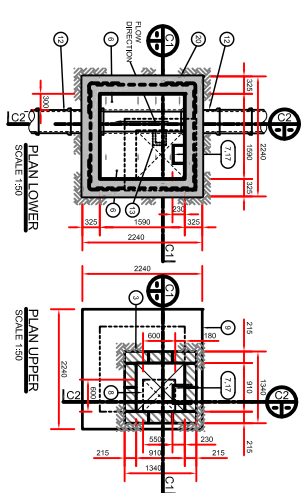
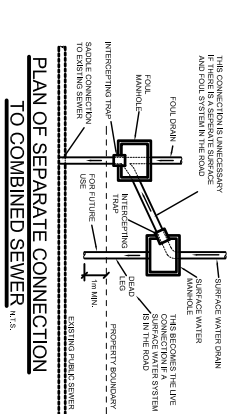
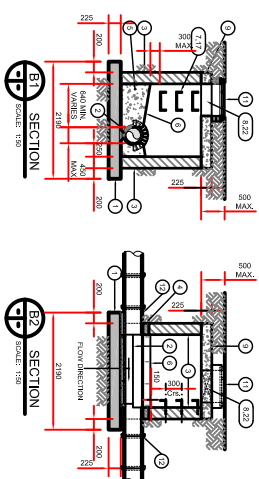
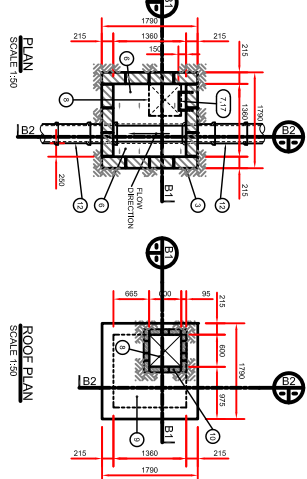
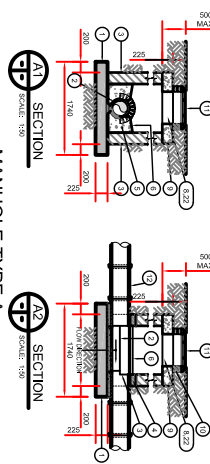
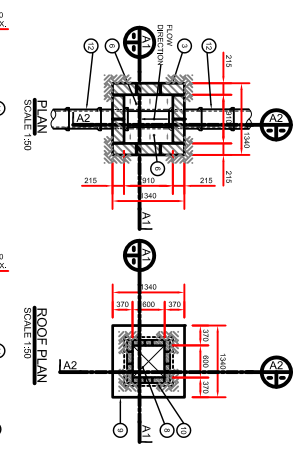
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| | | | |
| | | | |
| A | 20.JAN.2018 | Issue for | JR |
| Rev | Date | Description | By |

- | | |
|------------|--|
| ARLUM LTD. | Project:
Residential Development
Moneyduff, Oranmore
Co. Galway |
| | Title:
Standard Watermain Details
and Roads Trooppaths Sections |

- Scale @ A1: As Shown

- | | | | | | |
|-------------------|-------------------|----------|----|-------|---------|
| Prepared By: | JK | Checked: | BR | Date: | June 20 |
| Project Director: | Michael McDonnell | | | | |
| Drawing Status: | Planning | | | | |

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www.tobin.ie

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4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL POSITION OF ALL SERVICES, UTILITIES, ETC. ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
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Rev	Date	Description	By	Chk.
A	20.05.2018	Issued for	JK	BR

ARLUM LTD.

Project:
Residential Development
Moneyduff, Oranmore
Co. Galway

Title: **Manhole Details**
Sheet 1

Scale @ A1:	As Shown
Prepared by:	Checked:
Date:	Date:

Project Director:	Michael McDonnell
Drawing Status:	Planning

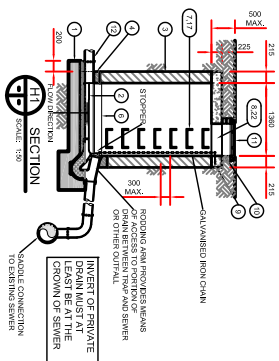


TOBIN

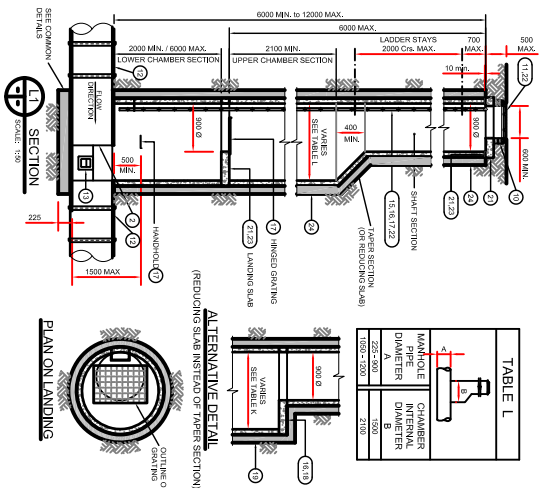
 Patrick Tobin & Co., Ltd.

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 Galway, Ireland.
 Tel: +353(0)91-565211
 fax: +353(0)91-565388
 e-mail: gahyes@dochr.ie
 www.dochr.ie

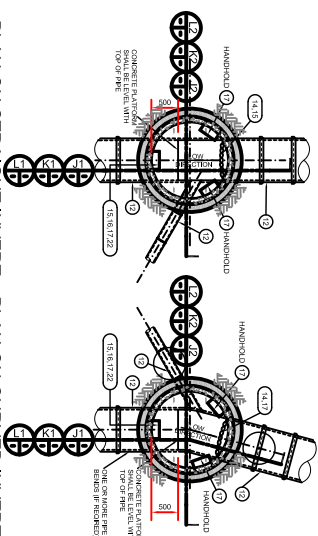
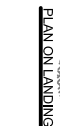
Drawing No.: 10402-2015
 Revision: A



MANHOLE TYPE H
INTERCEPT TRAP DETAILS
FOR OUTFALL MANHOLES AT SITE BOUNDARY
PRIOR TO CONNECTING TO PUBLIC SYSTEM

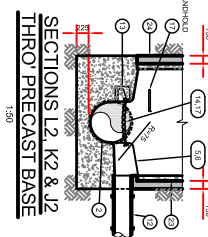


MANHOLE TYPE L

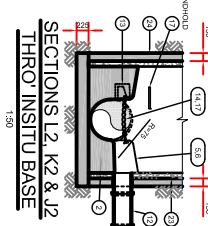


PLAN ON STRAIGHT INVERT

PLAN ON CURVED INVERT (WITHOUT COVER SLAB)




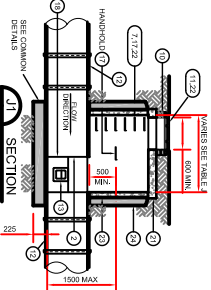
SECTIONS L2, K2 & J2
THRO' PRECAST BASE




SECTIONS L2, K2 & J2
THRO' INSITU BASE

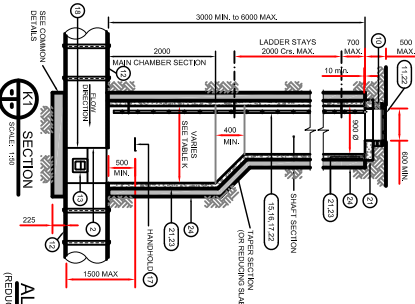
COMMON DETAILS

TABLE J									
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MAXIMUM PIPE DIAMETER A	CHAMBER INTERNAL DIAMETER B								
LESS THAN 375	1200								
375 TO 450	1350								
500 TO 750	1500								

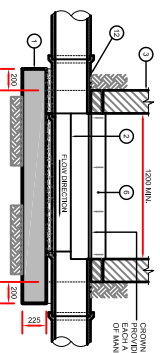


MANHOLE TYPE J

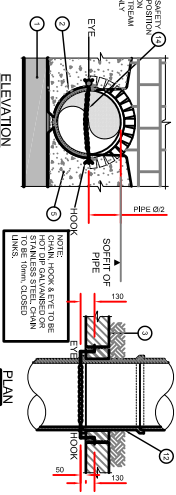
TABLE K															
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MAIN HOLE PIPE Ø A	CHAMBER INTERNAL Ø B														
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375 TO 450	1350														
500 TO 750	1500														
900	1590														
1050	2100														
1200	2100														



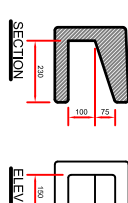
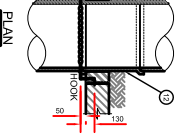
MANHOLE TYPE K



ALTERNATIVE METHOD OF FORMING CHANNEL THROUGH MANHOLE
SCALE 1:25



SAFETY CHAIN, HOOK & EYE DETAIL N.T.S.



DETAILS OF TOE HOLD

NOTES

- [illegible]

Client: ARLUM LTD

Project:
Residential Development
Moneyduff, Oranmore
Co. Galway

Manhole D
Sheet

A	20/06/2018	Issued for	
Rev	Date	Description	By CH

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3. ENGINEER/EMPLOYERS REPRESENTATIVE, APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

NOTES:

Scale @ A1: As Shown

JK	BR	JL
Project Director:	Michael McDonnell	
Drawing Status:	Planning	



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www.tobin.ie

Drawing No.: 10402-2016 A



LEGEND

- Tech 30w 18-ED 400K 700mA
- Forward Throw Optic A8
- 4105 Lumens
- Tech 30w 18-ED 400K 700mA
- Street Optic Wide A8
- 4105 Lumens
- Tech 27w 18-ED 400K 500mA
- Street Optic Wide A8
- 3120 Lumens

NOTES:

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Rev	Date	Description	By	Check
1	10/02/2018	Issue for Planning	AK	BR
2	17/03/18	Issue for Approval	AK	BR

Client:
ARUM LTD.

Project:
**Residential Development
Moneyduff, Orammore
Co. Galway**

Title:
Proposed Lighting Layout

Scale @ A1:
1:1000

Prepared By:
BR

Checked:
June 2018

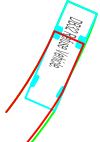
Project Director:
Michael McDonnell

Drawing Status:
Planning

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www.tobin.ie

Drawing No.: **10402-2018** Revision: **B**

LEGEND



DB32 Refuse Vehicle:
Overall Width: 2.400m
Overall Length: 6.000m
Min Body Ground Clearance: 0.380m
Min Body Ground Clearance: 0.380m
Load-to-lock time: 0.35m
Curb to Curb Turning Radius: 9.825m



NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Check
1	10/04/2019	Issue for Planning	JK	BR
2	10/04/2019	Architect Layout Approved	JK	BR

Client:
ARJUM LTD.

Project:
Residential Development
Moneyduff, Orammore
Co. Galway

Title:

Autotrack Layout
Refuse Vehicle

Scale @ A1 / A3 : 1:1000 / 1:2000

Prepared by: BR
Checked: June 2018

Project Director: Michael McDonnell

Drawing Status: Preliminary



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Fax: +353-091-566338
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Drawing No.: 10402-2019
Revision: B

LEGEND



Large Car (2006)
Overall Width 1.92m
Overall Height 1.44m
Min. Entry Clearance 2.13m
Max. Track Width 1.83m
Max. Wheelbase 2.83m
Curb to Curb Turning Radius 5.90m

NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev	Date	Description	By	Check
1	10/04/2020	Issue for Planning	JK	BR
2	10/04/2020	Architect Layout Approved	JK	BR

Client:
ARLUM LTD.

Project:
Residential Development
Moneyduff, Oramore
Co. Galway

Title:

Autotrack Layout
Large Car

Scale @ A1 / A3 : 1:1000 / 1:2000

Prepared by: BR
Checked: June 2018

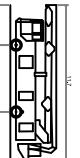
Drawn by: Michael McDonnell
Status: Planning



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Belturbet, Co. Tyrone BT22 8YU
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Fax: +353-091-565389
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Drawing No.: 10402-2020
Revision: B

LEGEND



Hydraulic Inspection Platform
Overall Length 11.200m
Overall Body Height 3.450m
Truck Width 2.450m
Curb to Curb Turning Radius 9.375m

NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MAIN HEAD

Rev	Date	Description	By	Check
1	10/04/2021	Issue for Planning	JK	BR
2	10/04/2021	Architect Layout Approved	JK	BR

Client:
ARJUM LTD.

Project:
Residential Development
Moneyduff, Orammore
Co. Galway

Title:

Autotrack Layout
Fire Truck

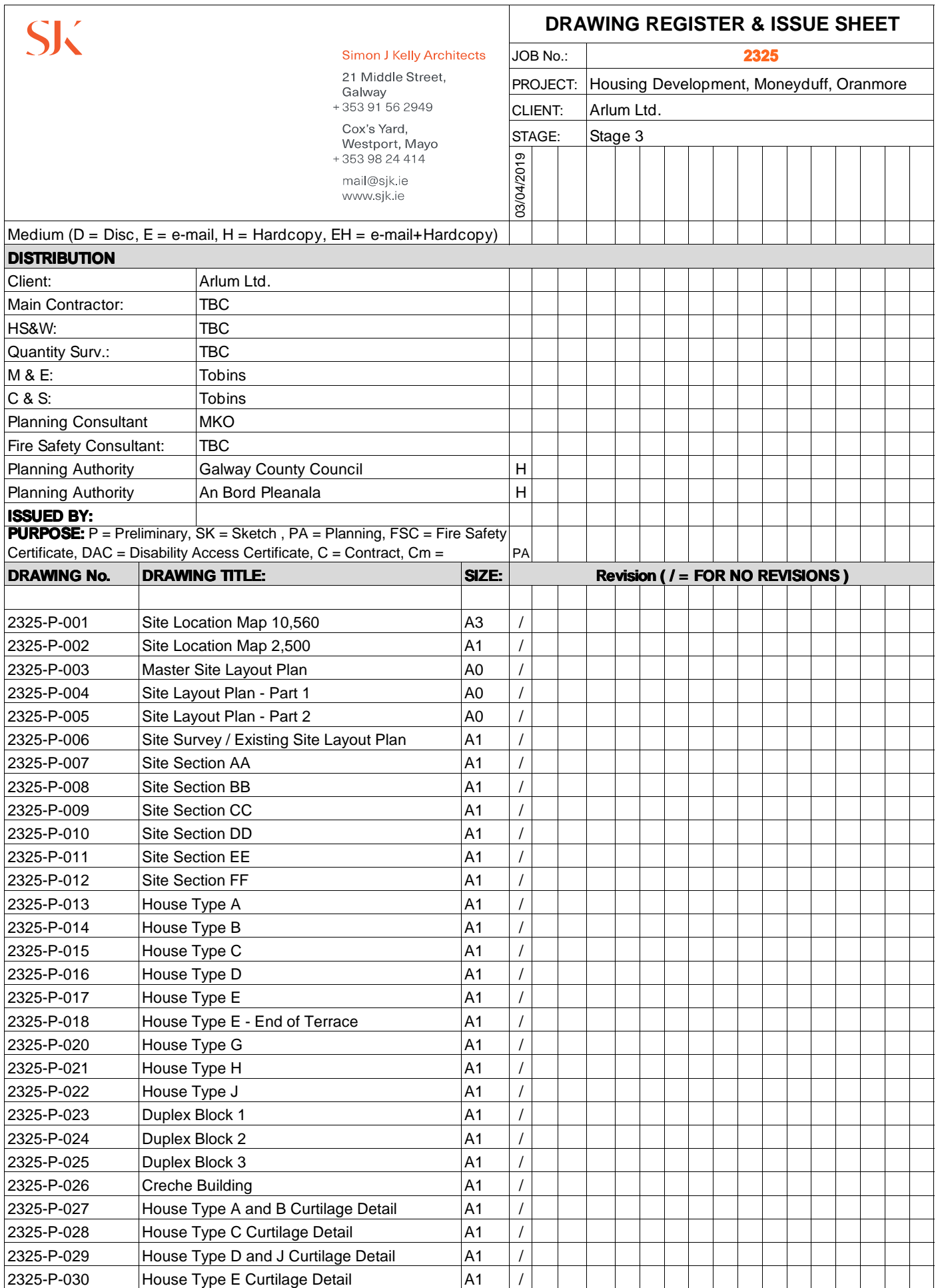
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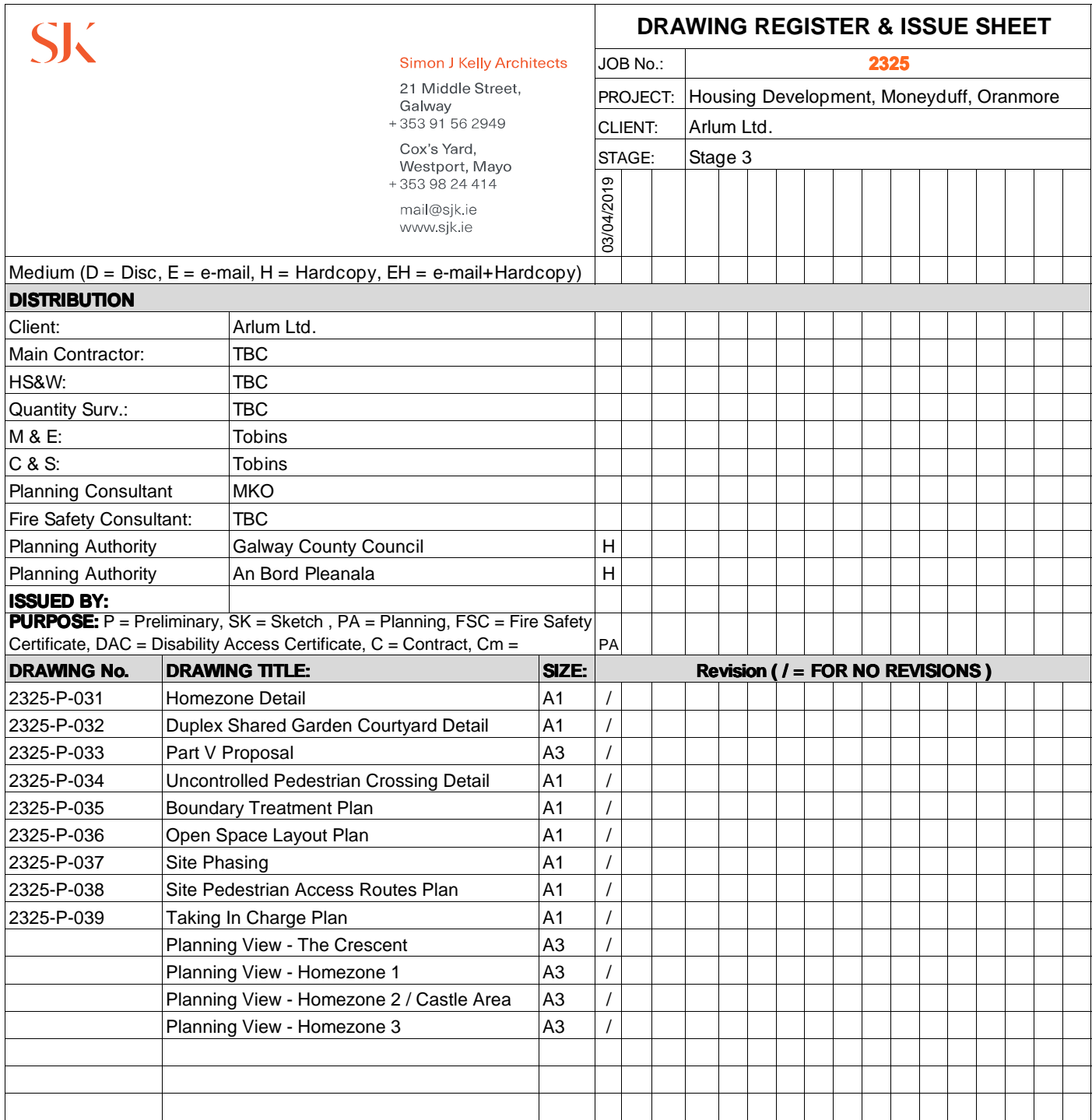
Prepared by: BR
Checked: June 2018

Drawn by: Michael McDonnell
Preliminary



Drawing No.: 10402-2021
Revision: B







THE CRESCENT



HOMEZONE 1



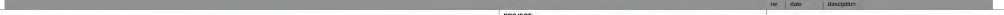
HOMEZONE 2 / CASTLE AREA



HOMEZONE 3



REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION

[illegible]

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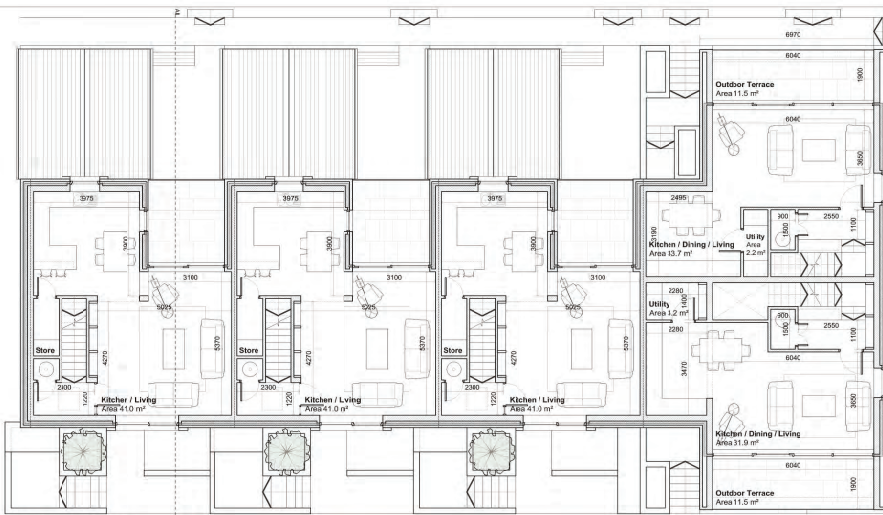
preliminary
not for construction

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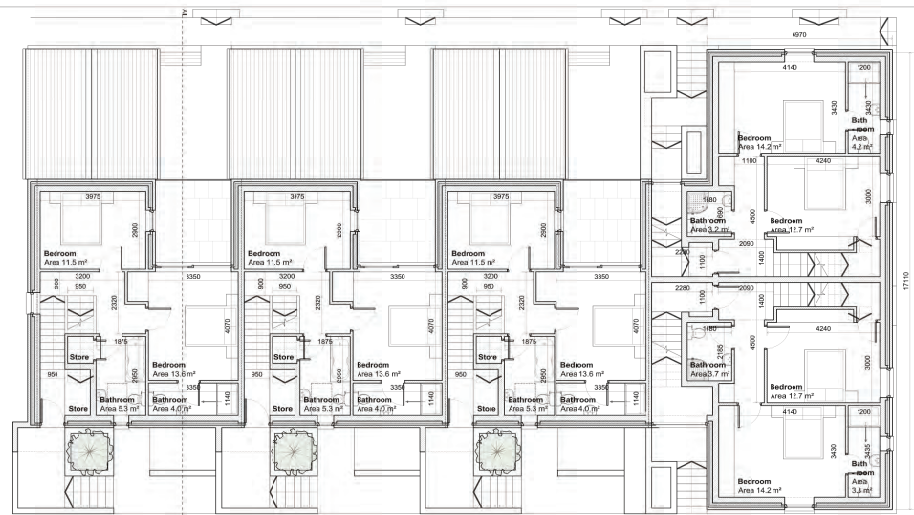
PROJECT:			
Housing Development, Moneyduff, Oranmore, Co Galway			
CLIENT:			
Arium Itc			
DRAWING:			
Duplex block 2 (4 no. - 133 to 164 inc.)			
General Arrangement Drawings			
DRAWING PURPOSE:		DRAWN BY:	DATE:
Stage 3		B.S	E.T Feb. 2019
DRAWING SIZE:	SCALE:	DRAWING REFERENCE:	REV. NO.
A1	1:100	2/25-P.024	

SK

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Cox's Yard,
Westport, Mayo
+353 98 24 411
mail@sjk.ie
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SECOND FLOOR PLAN
SCALE 1:100



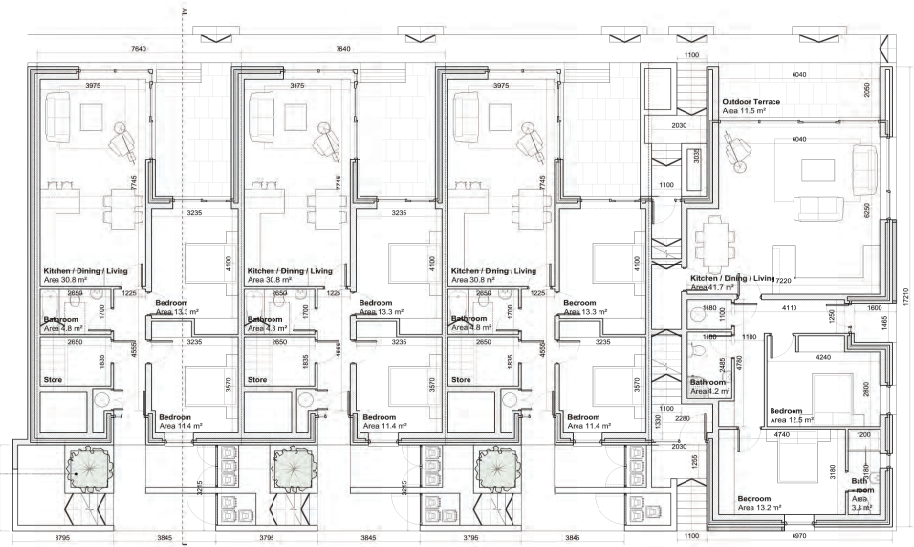
FIRST FLOOR PLAN
SCALE 1:100



FRONT ELEVATION
SCALE 1:100



REAR ELEVATION
SCALE 1:100



GROUND FLOOR PLAN
SCALE 1:100

REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION

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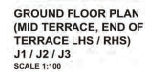
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preliminary
not for construction

PROJECT: Housing Development, Moneyduff, Oranmore, Co Galway		DRAWING NO: Arlum 1/c	
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S.	
DRAWING SIZE: A1		APPROVED BY: E.T.	
SCALE: 1:100		DATE: Feb. 2019	
DRAWING REFERENCE: 2325-P-023		REV. NO. 1	

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Cor's Yard,
Westport, Mayo
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mail@sk.ie
www.sk.ie

REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION



REFERENCE IMAGES

[illegible][illegible]

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15. All drawings are to be read in conjunction with the fire safety compliance report, all other contract documents, all statutory consents and requirements and all statutory obligations.

PROJECT: Housing Development, Moneyduff, Dranmore, Co Galway	
CLIENT: Arlism Itc	
DRAWING: House Type J	
General Arrangement Drawings	
DRAWING PURPOSE: Stage 3	DRAWN BY: B.S
DRAWING SIZE: A1	SCALE: 1:100
	APPROVED: E.T
	DATE: Feb. 2005
	DRAWING REFERENCE: 2205.P-022
	REV. NO.

ref.	date	description
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
SJ

Simon J Kelly Architects
21 Middle Street,
Galway
+353 91 56 2949
Cox's Yard,
Westport, Mayo
+353 98 24 411
na@sjk.ie
www.sjk.ie

```

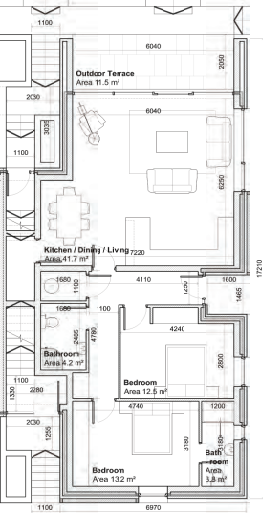
preliminary
not for construction

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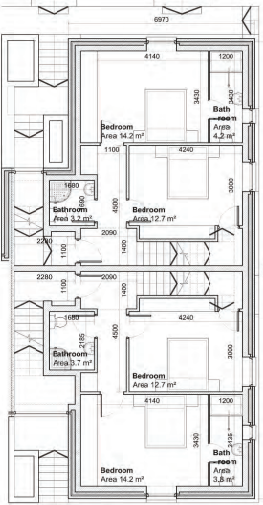



DUPLEX TYPE H
 Duplex - 2 bedroom (: 3)
 3 storey
 67'0" x 108'0" x 9' : 31'0" x 110'0" x 9' : 10'0" x 110'0" x 9' : 10'0" x 110'0" x 9'

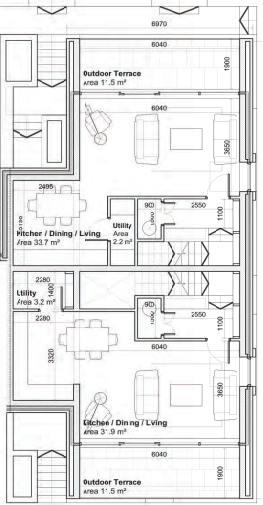
REFER TO SITE LAYOUT PLAN FOR INDIVIDUAL HOUSE FLOOR LEVELS AND HOUSE ORIENTATION



GROUND FLOOR PLAN
SCALE 1:100



FIRST FLOOR PLAN
SCALE 1:100



SECOND FLOOR PLAN
SCALE 1:100



END ELEVATION
SCALE 1:100



FRONT ELEVATION
SCALE 1:100



REAR ELEVATION
SCALE 1:100

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PROJECT:
Housing Development, Moneyduff, Oranmore, Co Galway

CLIENT:
Artem 1tc

DRAWING:
House Type H (2 Bedroom Duplex Over 2 Bedroom Duplex)

DRAWING PURPOSE:
Stage 3

DRAWING SIZE:
A1

DRAWN BY:
B.S.

CHECKED BY:
E.T.

DATE:
Feb. 2019

REV. NO.
REV. NO.

SCALE:
1:100

DRAWING REFERENCE:
2325-P-021

PROJECT:
Housing Development, Moneyduff, Oranmore, Co Galway

CLIENT:
Artem 1tc

DRAWING:
House Type H (2 Bedroom Duplex Over 2 Bedroom Duplex)

DRAWING PURPOSE:
Stage 3

DRAWING SIZE:
A1

preliminary
not for construction

SK

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Galway

+353 91 56 2549

Co's Yard,
Westport, Mayo

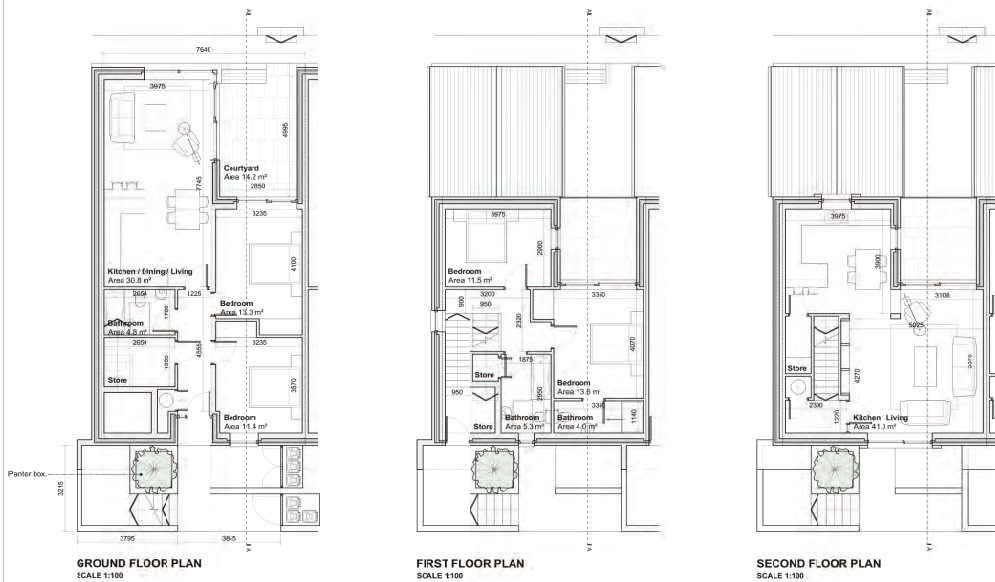
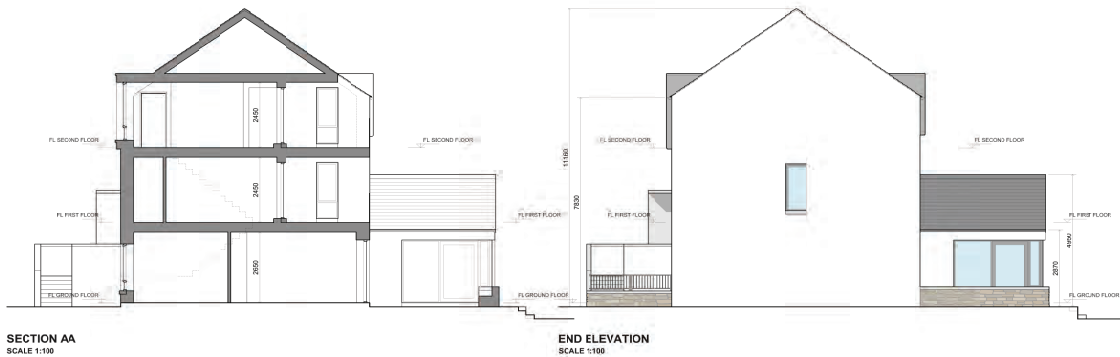
+353 98 24 411

info@sk.ie

www.sk.ie

REV. NO.

DESCRIPTION


[illegible][illegible]

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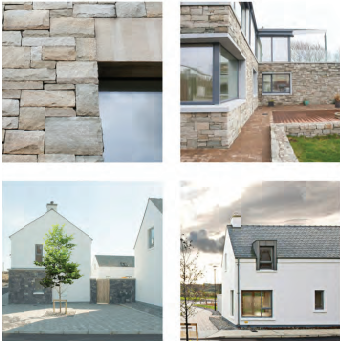
preliminary
not for construction

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PROJECT:	HousingDevelopment, Mondevud, Oraramo Co Galway	 Simon J Kelly Architects 11 Middle Street, Galway +353 91 268 259 Don's Yard, Westport, Mayo +353 96 24 416 mail@sjk.ie www.sjk.ie
CLIENT:	Arlum M	
DRAWING:		
House Type 6 (2 Bedroom over 2 Bedroom Duplex)		
GeneralArrangement Drawings		
GOINGING NUMBER:	DRAWN BY:	DATE:
Stage 3	B.3 E.T	Feb. 2016
DRAWING SIZE:	SCALE:	REV. NO.
A3	1:200	1

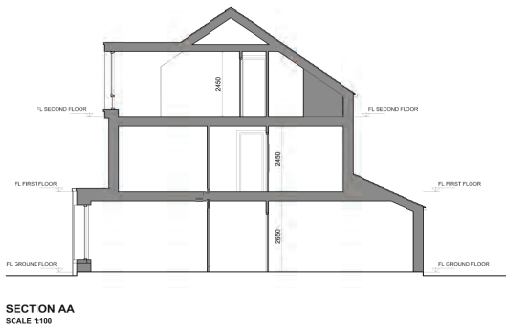
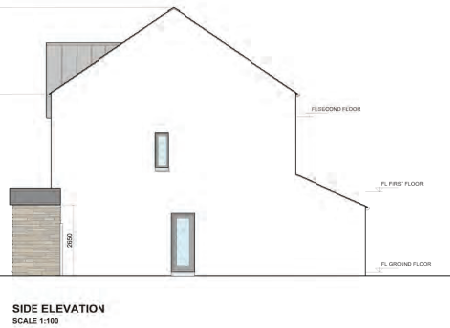
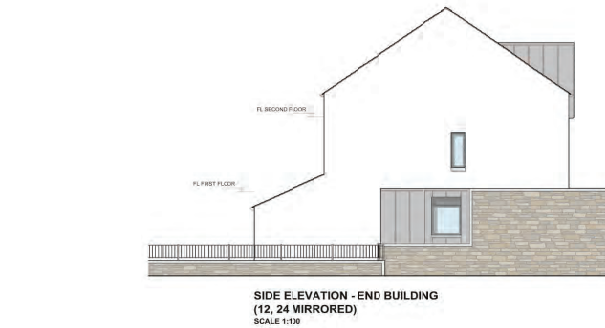
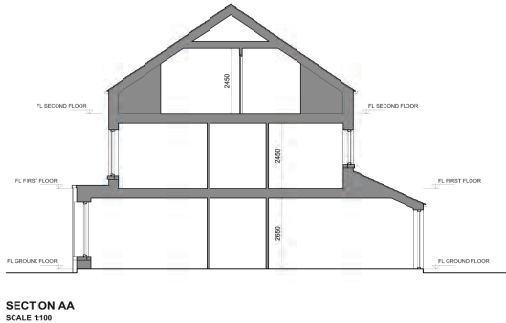
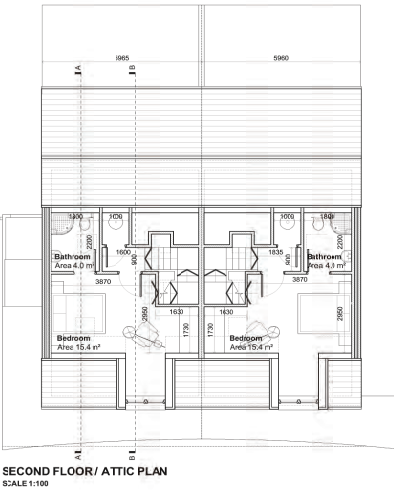
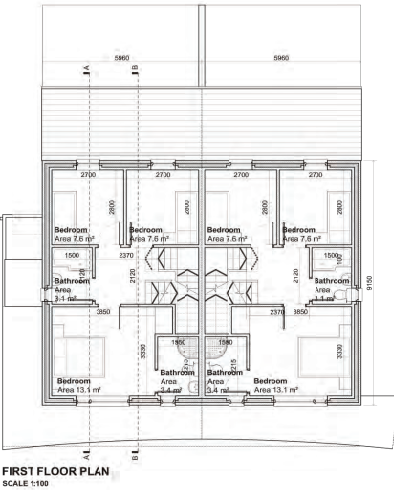
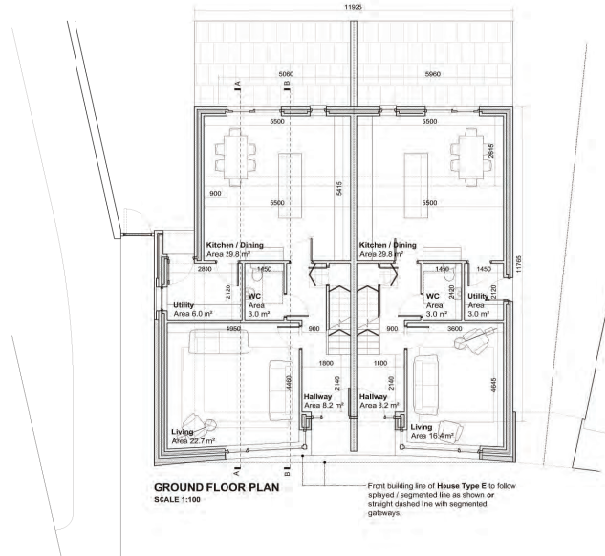
	HOUSE TYPE E1
	Semi-detached 4 bedroom
	2 nd storey Nos. 1, 12, 3 and 24
	149 m ² / 1613 sq. ft.

REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION



REFERENCE IMAGES

preliminary
not for construction



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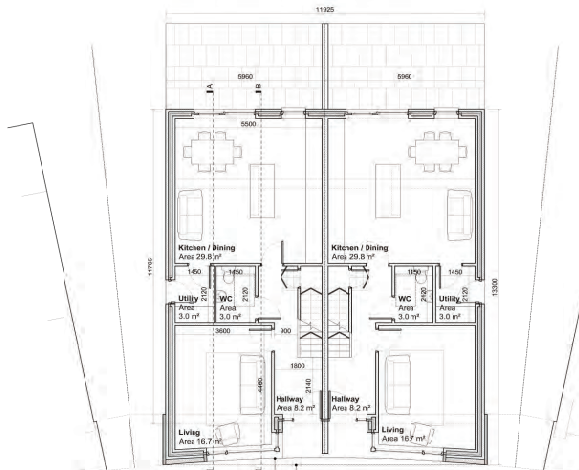
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	HOUSE TYPE E
	Semi-detached 4 bedroom
	2 1/2 storey
140 m ² / 1536 sq. ft.	

REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION

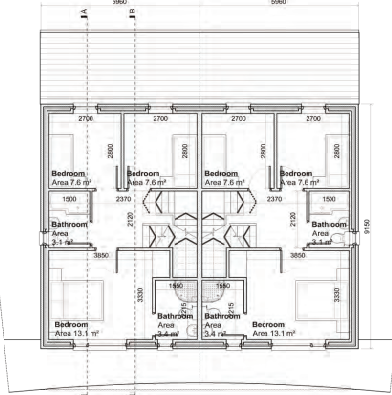


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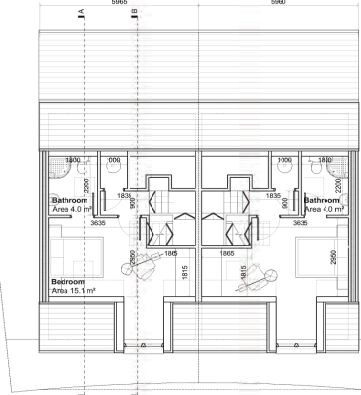


GROUND FLOOR PLAN
SCALE 1:100

Front building line of House Type E to follow
play/ed segmented line as shown or
straight dashed line with segmented
gateways.



FIRST FLOOR PLAN
SCALE 1:100



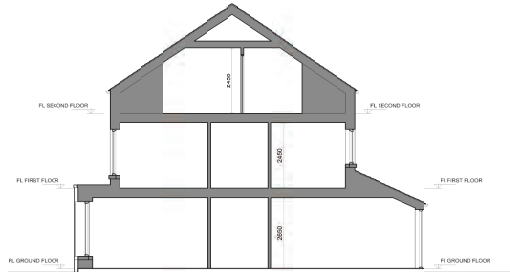
SECOND FLOOR / ATTIC PLAN
SCALE 1:100



FRONT ELEVATION
SCALE 1:100



REAR ELEVATION
SCALE 1:100



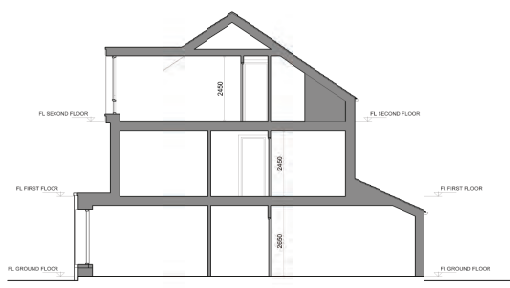
SECTION AA
SCALE 1:100



SIDE ELEVATION
SCALE 1:100



SIDE ELEVATION
SCALE 1:100



SECTION AA
SCALE 1:100

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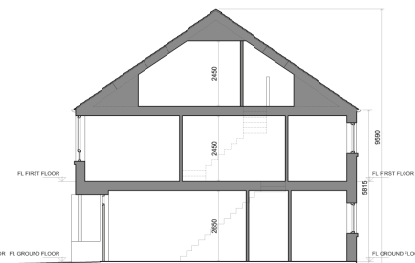
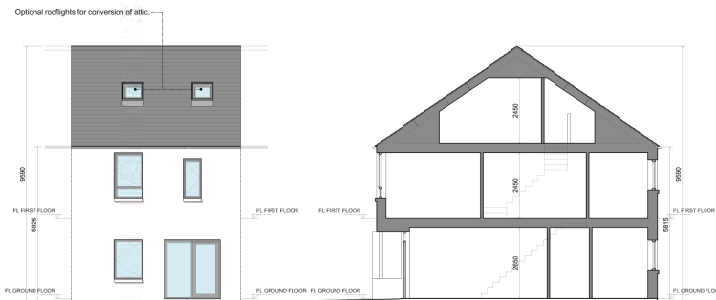
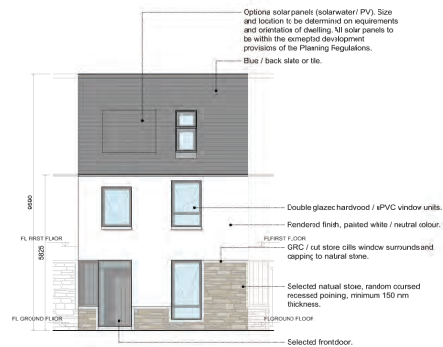
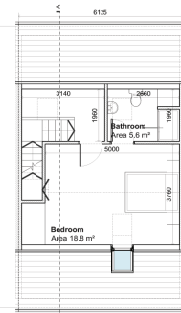
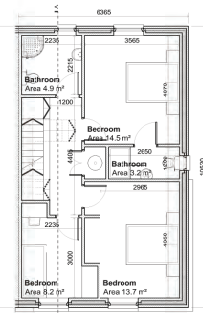
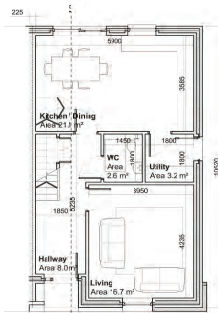
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CLIENT: Arlum Ltd			
DRAWING: House Type E			
DRAWING PURPOSE: Stage 3			
DRAWING SIZE: A1	SCALE: 1:100	DRAWN BY: B.S	APPROVED: E.T
		DATE: June 18	REV. NO. 1

preliminary
not for construction

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	HOUSE TYPE D
	Terraced 3 bedroom
	2 storey
	114 m ² / 1212 sq. ft

REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION



REFERENCE IMAGES

preliminary
not for construction[illegible][illegible][illegible]

PROJECT:	Housing Development, Mor...
CLIENT:	Arlum Itc
DRAWING:	House Type 0
	General Arrangement Draw...
DRAWING PURPOSE:	
Stage 3	
DRAWING SIZE:	SCALE:
A1	1:100

SUFF, DRANMORE, CO GALWAY _____ _____ _____			Simon J. Keane 21 Middle Galway +353 91 56 24 24 Cox's Yard Westport, +253 98 24 24 Email: nail@sjk.ie www.sjk.ie
IN BY: _____ _____ _____	APPROVED: _____ E.T. Feb. 2019 _____ _____		DATE: _____ _____ _____
WORKING REFERENCE: S.P-016	REV. NO. _____ _____		_____ _____ _____
_____ _____ _____			

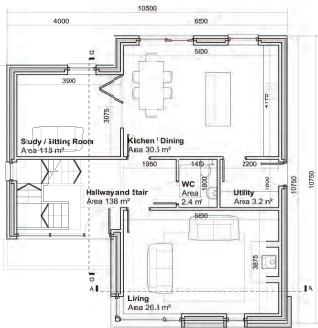
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	HOUSE TYPE C
	Detached 4 bedroom
	2 storey
	133 m ² / 1734 sq. ft

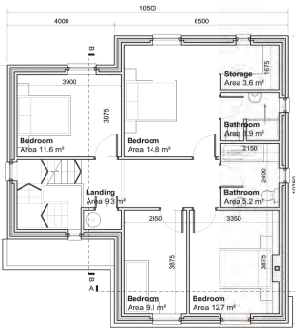
REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION



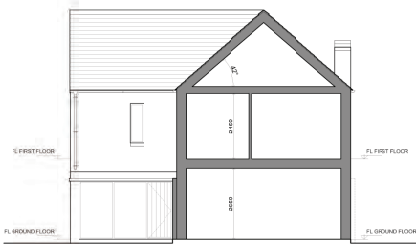
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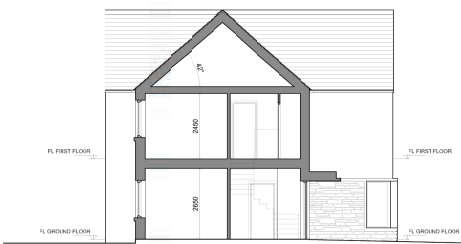
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SCALE 1:100



FIRST FLOOR PLAN
SCALE 1:100



SECTION AA
SCALE 1:100



SECTION BB
SCALE 1:100



FRONT ELEVATION
SCALE 1:100



SIDE ELEVATION
SCALE 1:100



REAR ELEVATION
SCALE 1:100



SIDE ELEVATION
SCALE 1:100

Optimal solar panels (solar water / PV). Size and location to be determined on requirements and orientation of building. All solar panels to be within the extended development provisions of the Planning Regulations.

Blue / black slate or tile.

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PROJECT: Housing Development, Moneyduff, Drommore, Co. Galway			
CLIENT: Artem Itc			
DRAWING: House Type C			
DRAWING PURPOSE: Stage 3			
DRAWING SIZE: A1	SCALE: 1:100	DRAWN BY: B.S	APPROVED: E.T
		DATE: Feb. 2019	REV. NO. 1

SK

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Westport, Mayo

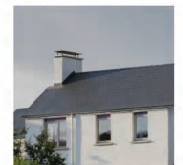
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REFER TO SITE LAYOUT PLAN
FOR INDIVIDUAL HOUSE
FLOOR LEVELS AND HOUSE
ORIENTATION



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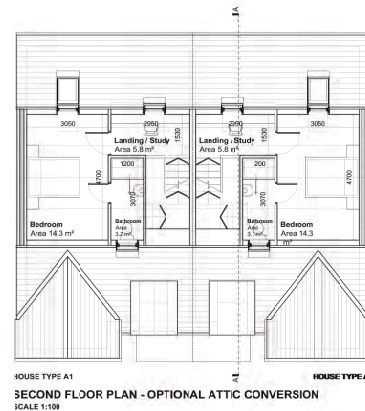
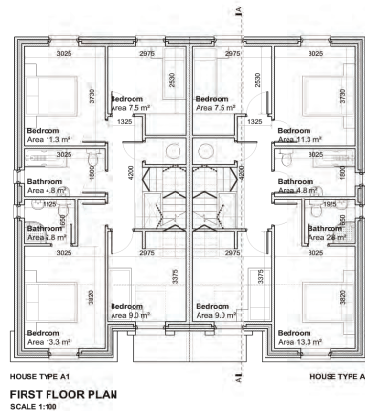
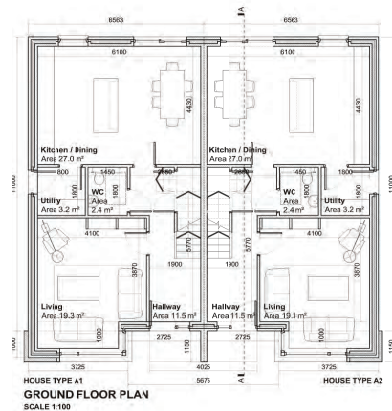
PROJECT: Housing Development, Moneyduff, Crannmore, Co Galway	
CLIENT: Arlum Ltd	
DRAWING: House Type E	
General Arrangement Drawings	
DRAWING PURPOSE: Stage 3	DRAWN BY: B.S. APPROVED: E.T. DATE: Feb. 2001
DRAWING SIZE: A1	SCALE: 1:100 DRAWING REFERENCE: 235-P-114 REV. NO.

DRAWING PURPOSE:				DRAWN BY:	APPROVED:	DATE:
Stage 3				B.S	E.T	Feb. 2
DRAWING SIZE:		SCALE:	DRAWING REFERENCE:		REV. NO.	
A1		1:100	2325-P-314			

rev.	date	description
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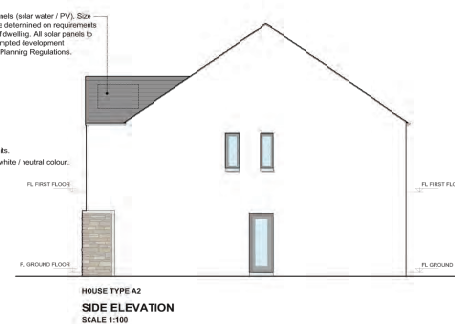
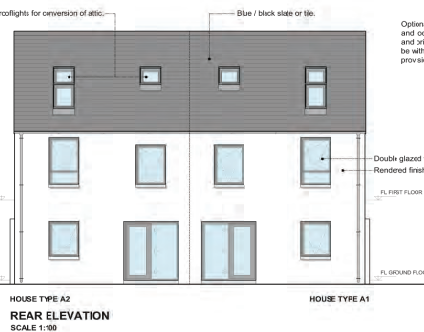
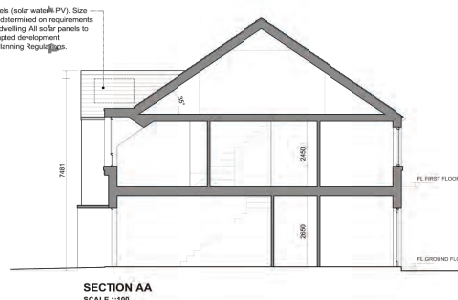
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REFERENCE IMAGES

EXTERNAL WALL CONSTRUCTION

Overall building dimensions are shown for a 350 mm structural wall build up.
Subject to final detail design of the external walls the overall building dimensions
may increase by c. 100 mm.



5. Study responses however chosen are to be such as:

5a. Should require only the drawing in whole or a part with or without comments they should also copy these contents of use in full anthology where it fits the copy. These contents of use are to be read in connection with the drawing and its contents. These contents of use first part is clearly and of its content and its description from the drawing and its content.

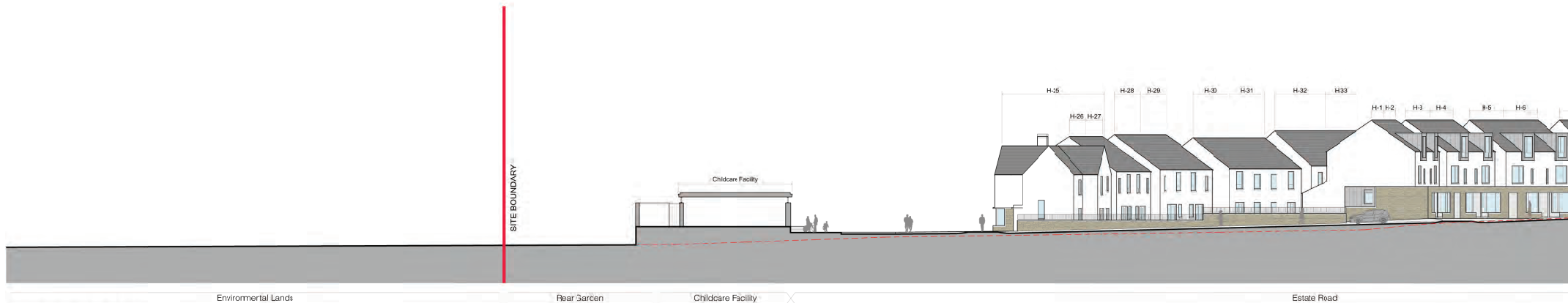
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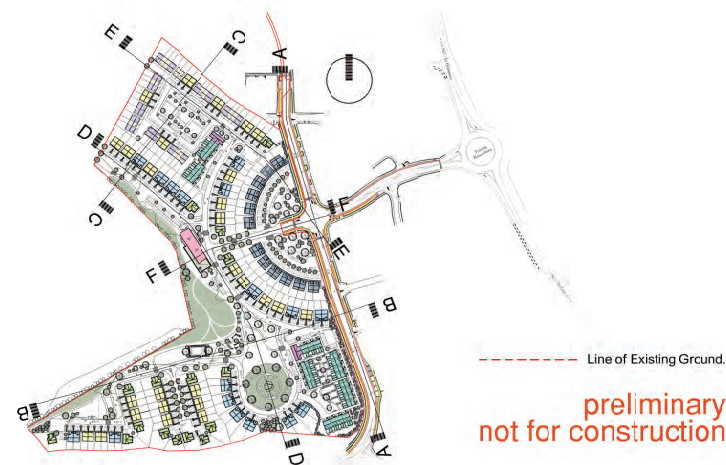
SITE SECTION FF
SCALE 1:500



SITE SECTION FF PART 1
SCALE 1:200



SITE SECTION FF PART 2
SCALE 1:200



SECTION KEY
SCALE 1:3000

[illegible][illegible][illegible]

PROJECT:	Housing Development, Monrovia	
CLIENT:	Actium Ltd	
DRAWING:	Planning	
DRAWING PURPOSE:	Stage 3	
DRAWING SIZE:	SCALE:	
A1	1:500 / 1:200	2

tuff, Granmore, to Galway 			Simon J Kelly 21 Middle Street Galway +353 91 58 29 29 Cux's Yard, Westport, +353 98 24 41 41 mail@sjk.ie www.sjk.ie
FROM BY: APPROVED: DATE: E.T. Feb. 2019	REV. NO.		

Architects



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----- Life of Existing Ground.

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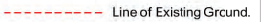


SITE SECTION AA PART 1
SCALE 1:200

SITE SECTION AA PART 2
SCALE 1:200



SITE SECTION AA PART 3
SCALE 1:200



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SECTION KEY
SCALE 1:3000

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PROJECT: Housing Development, Moneycuff, Cranmore, Co Galway			
CLIENT: Arlun Ltd			
DRAWING: Planning			
Site Section AA			
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S	APPROVED: E.T
DRAWING SIZE: A1		SCALE: 1:500 / 1:200	DRAWING REFERENCE: 2325-P-007
			DATE: Feb. 20
			REV. NO.

DRAWN BY: B.S	APPROVED: E.T	DATE: Feb. 2019
DRAWING REFERENCE: 2225 P.007		REV. NO.

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15. All drawings are to be read in conjunction with the full safety compliance report, all other contract documents, all statutory consent and/or requirements.

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PROJECT: Housing Development, Moneyduff, Dranmore, Co Galway			
CLIENT: Arlinn Itc			
DRAWING: Site Survey			
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S	APPROVED: DATE: E.T Feb.
DRAWING SIZE: SCALE: A4 1:500		DRAWING REFERENCE: REV. N 305, 306	

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NORTH
↑
SCALE 1: 000

Part 1 - Refer to sheet P-004
Part 2 - Refer to sheet P-005

Location of
Site Notice 0

Pedestrian Lin

Part 1 - Refer to sheet P-004
Part 2 - Refer to sheet P-005

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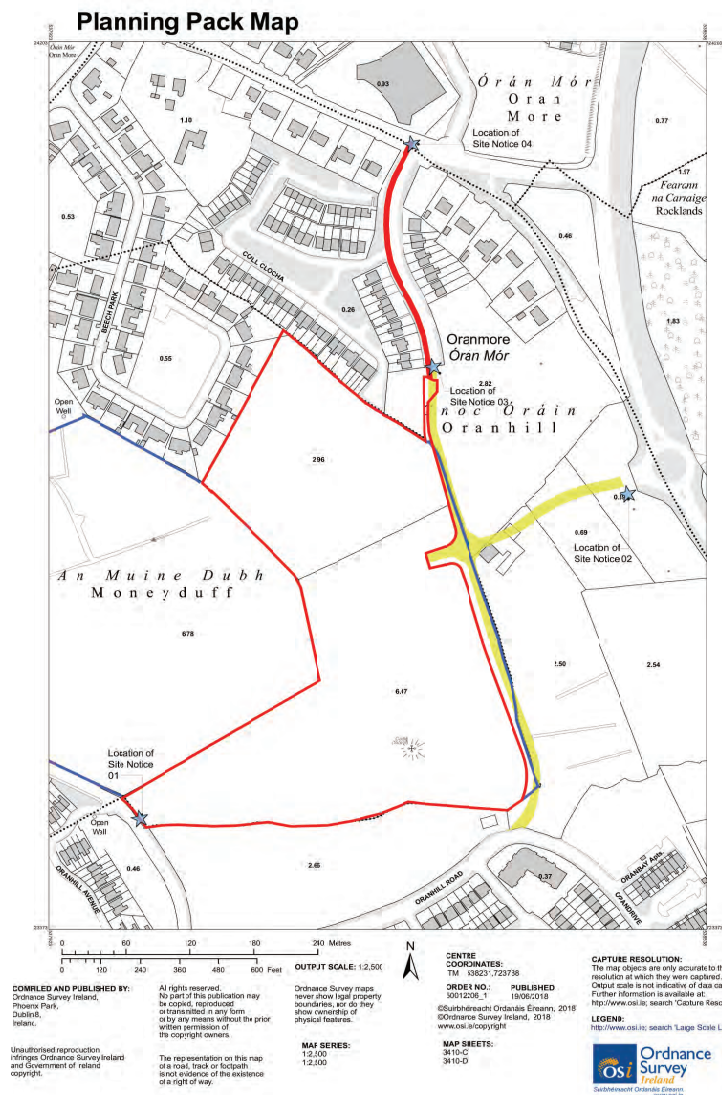
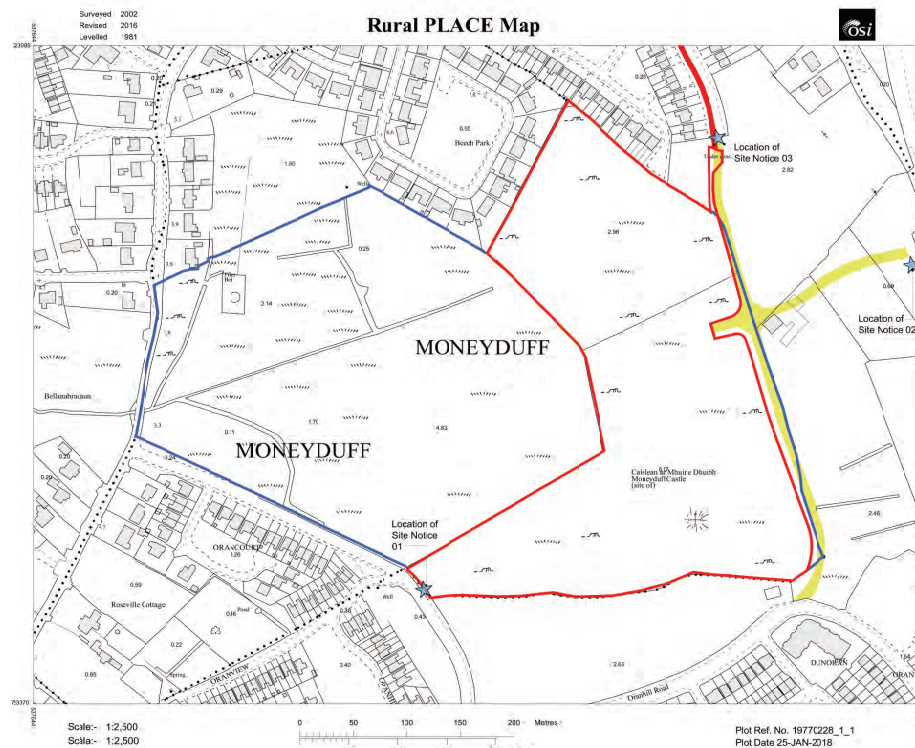
mal@sk.ie
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not for construction

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SITE LOCATION PLAN SHEET 1
SCALE 1:2500

SITE LOCATION PLAN SHEET 2
SCALE 1:2500

[illegible][illegible][illegible]

PROJECT:
Housing Development, Money

CLIENT:
Arlum Ltd

DRAWING:
Site Location Plan 2500

DRAWING PURPOSE:
Stage 2

DRAWING SIZE:
A1

SCALE:
as shown

DRAWN BY:
B.S.

DRAWN BY:
23/01/01

BY: _____	APPROVED: _____	DATE: _____		Simon J Kelly Architects
REFERENCE: _____	REV. NO. _____	_____		21 Middle Street Galway
P-002	_____	_____		Cc's Yard, Westport, Mayo +353 98 24 414 mail@sjk.ie www.sjk.ie

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PROJECT: Housing Development, Moneycuff, Cranmore, Co Galway			
CLIENT: Arlun Ltd			
DRAWING: Site Location Plan 2500			
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S	APPROVED: E.T
DRAWING SIZE: A1		SCALE: as shown	DRAWING REFERENCE: 2321-P-002
			DATE: Feb. 2019
			REV. NO.

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Surveyed 1838
Revised 1915
Levelled 1892

Record PLACE Map



5380572

724977

ITM CENTRE PT. COORDS.

538059,723678

DESCRIPTION

MAP SHEETS

6 inch
GY095

- Site outlined in red
- Land under ownership of Applicant outlined in blue
- Right of Way shown coloured yellow
- Galway Metropolitan Area boundary



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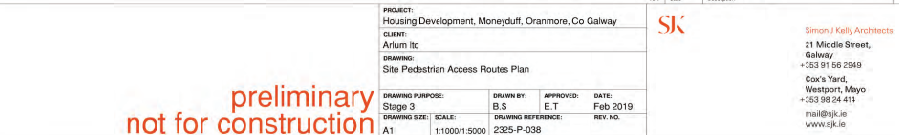
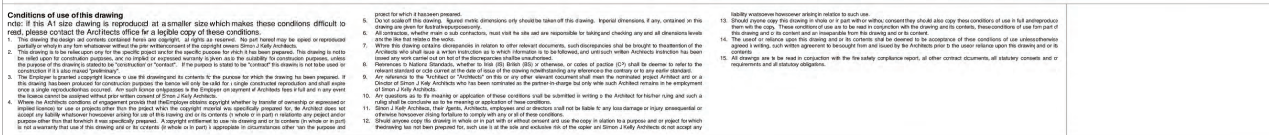
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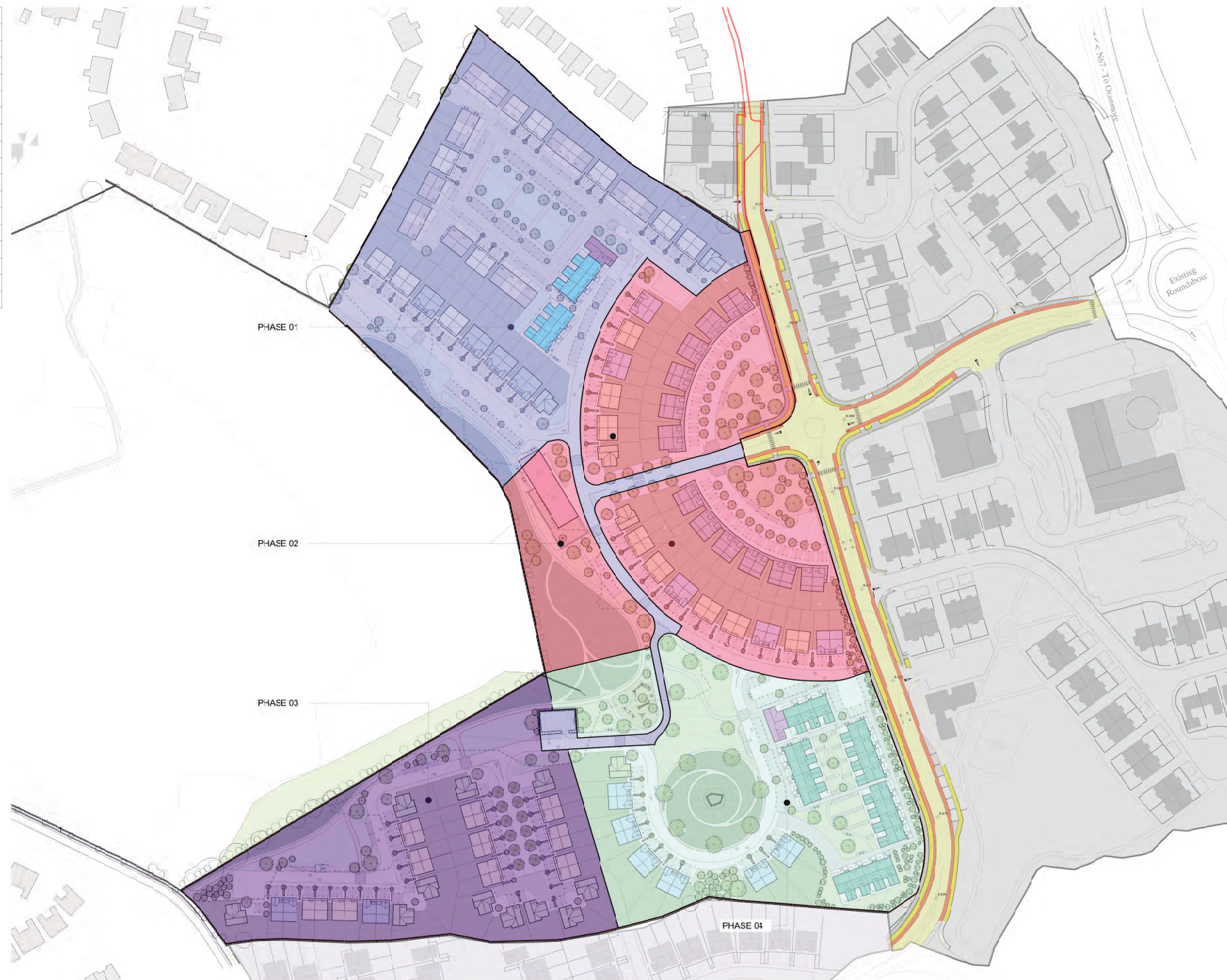


Scale:- 1:10,560
Scála:- 1:10,560

0 100 200 400 600 800 1,000 Metres
0 350 700 1,400 2,100 2,800 3,500 Feet

Plot Ref. No. 19770228_1
Plot Date 25-JAN-2018
























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PHASE C1 TOTAL DWELLINGS (71)	
	HOUSE TYPE A (08) Semi-detached 4 bedroom 2 storey - 132 m ² / 1420 sq. ft
	HOUSE TYPE E (18) Semi-detached 3 bedroom 2 storey - 111 m ² / 1194 sq. ft
	HOUSE TYPE C (02) Detached 4 bedroom 2 storey - 143 m ² / 1752 sq. ft
	HOUSE TYPE E (16) Terraced 3 bedroom 2 storey - 114 m ² / 1222 sq. ft
	HOUSE TYPE J (12) Terraced 2 bedroom 2 storey - 93 m ² / 1000sq. ft
	DUPLEX TYPE G (12) Duplex - 2 bed and 2 bed 3 storey 76 m ² / 823 sq. ft - 103 m ² / 1114 sq. ft
	DUPLEX TYPE H (3) Duplex - 2 bedroom (x 3) 3 storey 97 m ² / 104 sq. ft - 111 m ² / 1194 sq. ft - 120 m ² / 1308 sq. ft
PHASE 02 TOTAL DWELLINGS (52)	
	HOUSE TYPE A (10) Semi-detached 4 bedroom 2 storey - 132 m ² / 1420 sq. ft
	HOUSE TYPE E (16) Semi-detached 3 bedroom 2 storey - 111 m ² / 1194 sq. ft
	HOUSE TYPE C (02) Detached 4 bedroom 2 storey - 143 m ² / 1752 sq. ft
	HOUSE TYPE E (24) Semi-detached 3 bedroom 2½ storey - 140 m ² / 1506 sq. ft
	CRECHE (1) Detached 1 storey 374 m ² / 4020 sq. ft Room 1 41.4 m ² 42 no. Room 2 53.9 m ² 22 no. Room 3 41.4 m ² 22 no. 16 no.
PHASE 03 TOTAL DWELLINGS (35)	
	HOUSE TYPE A (04) Semi-detached 4 bedroom 2 storey - 132 m ² / 1420 sq. ft
	HOUSE TYPE E (20) Semi-detached 3 bedroom 2 storey - 111 m ² / 1194 sq. ft
	HOUSE TYPE C (11) Detached 4 bedroom 2 storey - 143 m ² / 1752 sq. ft
PHASE 04 TOTAL DWELLINGS (54)	
	HOUSE TYPE A (12) Semi-detached 4 bedroom 2 storey - 132 m ² / 1420 sq. ft
	HOUSE TYPE C (01) Detached 4 bedroom 2 storey - 143 m ² / 1752 sq. ft
	DUPLEX TYPE G (38) Duplex - 2 bed and 2 bed 3 storey 76 m ² / 823 sq. ft - 103 m ² / 1114 sq. ft
	DUPLEX TYPE H (3) Duplex - 2 bedroom (x 3) 3 storey 97 m ² / 104 sq. ft - 111 m ² / 1194 sq. ft - 120 m ² / 1308 sq. ft
OVERALL SITE (212)	

rev.	date	description	by
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NORTH
SCALE 1:1000

Refer to images or this sheet for further information

TYPE 9
Existing boundary retained



IMAGE 12 - Existing stone wall and hedge to be retained



IMAGE 13 - Existing stone wall and hedge to be retained

Site Layout Plan
Scale 1:1000

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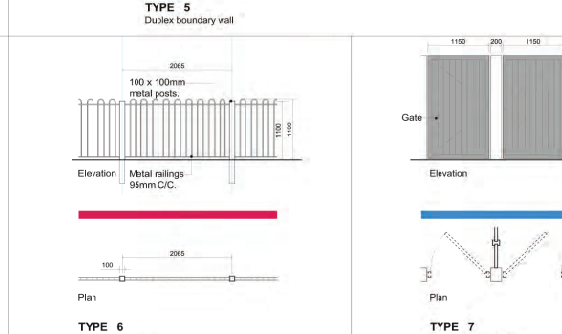
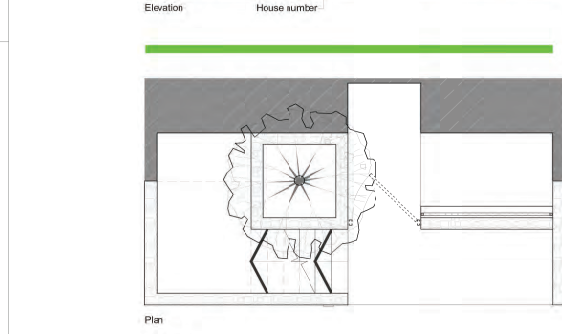
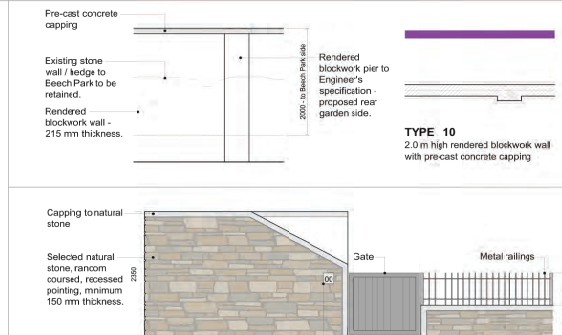
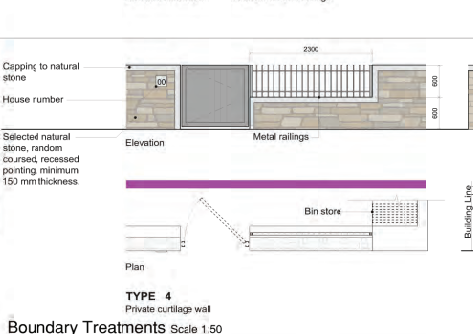
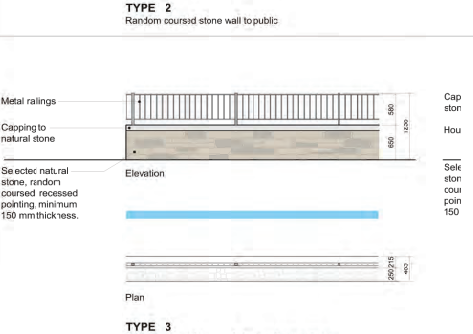
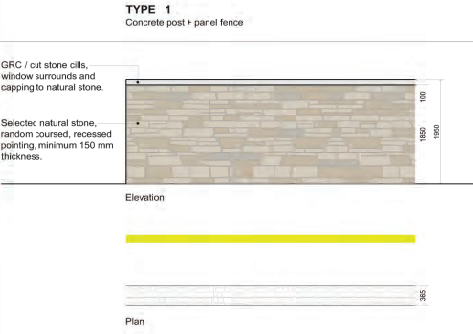
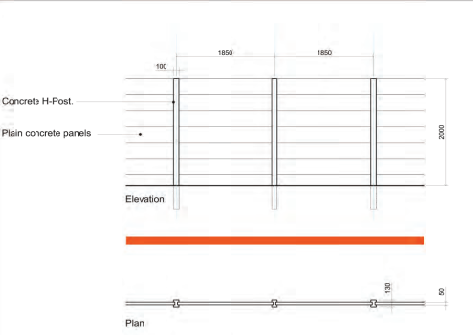
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[illegible][illegible]

Tarmac road.

1575

5150

2000

1575

150

Crossing formed paving blocks / imprinted concrete.

Reconstituted stone / natural stone / concrete edging.

UNCONTROLLED PEDESTRIAN CROSSING - SECTION

SCALE : 50



PROJECT: Housing Development, Moneyfund, Oranmore, Co Galway		DATE: 11/01/2019		DRAWN BY: JKL	
CLIENT: Arlam ltd		DATE: 11/01/2019		DRAWN BY: JKL	
DRAWING: Site Layout Plan - Pedestrian Crossings Pedestrian Crossing Details		DATE: 11/01/2019		DRAWN BY: JKL	
DRAWING PURPOSE: Stage 3		DRAWN BY: B.B.S		APPROVED: E.T	
DRAWING SIZE: A3		SCALE: 1:1000		DATE: Feb. 2019	
		DRAWING REFERENCE: 235_P-334		REV. NO. 001	

NORTH

SCALE 1:2000



PART V PROPOSAL (Subject to Agreement)	
	HOUSE TYPE B (04)
	House No's: 81, 82, 120, 121
	Semi-detached 3 bedroom 2 storey 111 m ² / 1194 sq. ft.
	HOUSE TYPE D (02)
	House No's: 83, 86
	Terraced 3 bedroom 2 storey 114 m ² / 1222 sq. ft.
	HOUSE TYPE J (04)
	House No's: 73, 74, 84, 85
	Terraced 2 bedroom 2 storey 93 m ² / 1000 sq. ft.
	DUPLEX TYPE G (10)
	House No's: 36, 38, 40, 127, 129, 131, 141, 143, 145, 147
	Apartment - 2 bedroom Ground floor 76 m ² / 822 sq. ft.
	DUPLEX TYPE H (01)
	House No's: 124
	Duplex - 2 bedroom Ground floor 97 m ² / 1044 sq. ft.
TOTAL DWELLINGS (21)	

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PROJECT: Housing Development, Moneyduff, Oranmore, Co Galway			
CLIENT: Arlum Ltd			
DRAWING: Site Layout Plan Part V Proposal - Subject to Agreement			
DRAWING PURPOSE: Stage 3	DRAWN BY: L.F / B.S	APPROVED: E.T	DATE: Feb. 2019
DRAWING SIZE: A3	SCALE: 1:2000	DRAWING REFERENCE: 2325-P-033	REV. NO. -



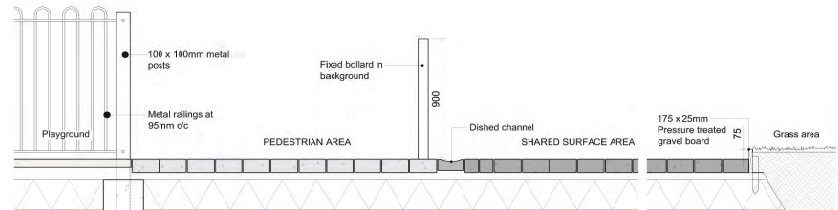
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+353 91 56 2949
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Westport, Mayo
+353 98 24 414
mail@sjk.ie
www.sjk.ie



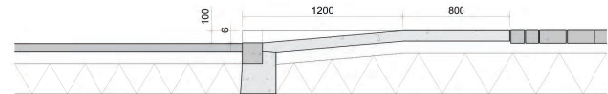
Duplex Shared Garden Courtyard Detail Plan
Scale 1:200



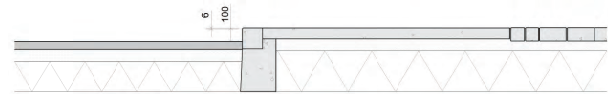
Shared Garden Overview - Design Development Model



PLAYGROUND TO SHARED SURFACE TRANSITION DETAIL
SCALE 1:20



DROPPED KERB DETAIL
SCALE 1:20



STANDARD KERB DETAIL
SCALE 1:20

Typical Kerb + Surfacing Details
Scale 1:20

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PROJECT:		Housing Development, Moneyduff, Orammore, Co Galway	
CLIENT:		Arifun Ltd	
DRAWING:		Site Layout Plan	
DRAWING PURPOSE:		Duplex Shared Garden Courtyard Detail Plan	
DRAWING SIZE:		A1	
SCALE:		1:200	
DRAWN BY:		L.F./B.S.	
APPROVED:		E.T.	
DATE:		Feb. 2019	
REV. NO.:		-	

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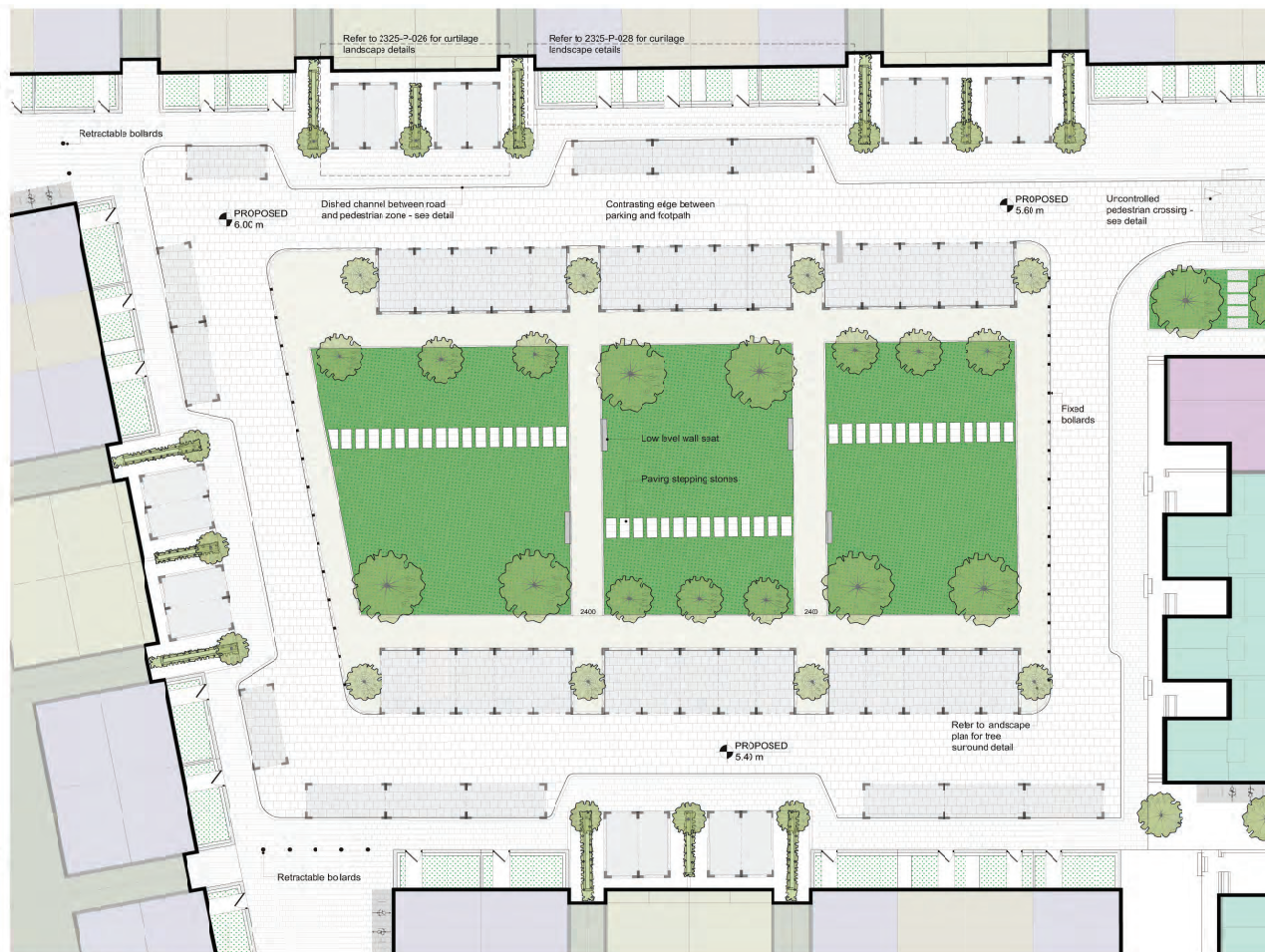


Figure 1: Typical cross-section of a concrete curb and gutter. The diagram shows a cross-section of a road edge with various layers and materials. Dimensions are given in millimeters. From left to right: a 100mm wide 'Selected concrete paving block' layer; a 1575mm wide 'Reconstituted stone / natural stone / concrete edging' layer; a 1600mm wide 'Crossing formed in paving blocks / imprinted concrete' layer; and a 1575mm wide 'Reconstituted stone / natural stone / concrete edging' layer. The total width of the curb and gutter is 4750mm. A 100mm wide 'Selected concrete paving block' layer is also shown on the far right.

An aerial photograph showing a proposed park layout. The park is a rectangular area with a light-colored paved border. Inside, there are two large green rectangular areas separated by a central paved path. The path has several crosswalks marked with white stripes. Numerous green trees are planted along the paths and around the green areas. Several cars are parked in designated spaces around the park. The surrounding area includes residential buildings with grey roofs and a street with a curved section on the right.

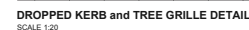


Example Images

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id	date	description	by
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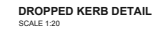
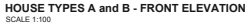
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HOUSE TYPES C and B - FRONT ELEVATION
(SCALE 1:10)

[illegible]

PROJECT: Housing Development, Moneycuff, Cranmore, Co Galway			
CLIENT: Arlun Ltd			
DRAWING: House Type C Front Curilage Detail			
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S	APPROVE: E.T
DATE: Feb. 2019			
DRAWING SIZE: A1	SCALE: 1: 00	DRAWING REFERENCE: 2325-P-028	REV. NO.

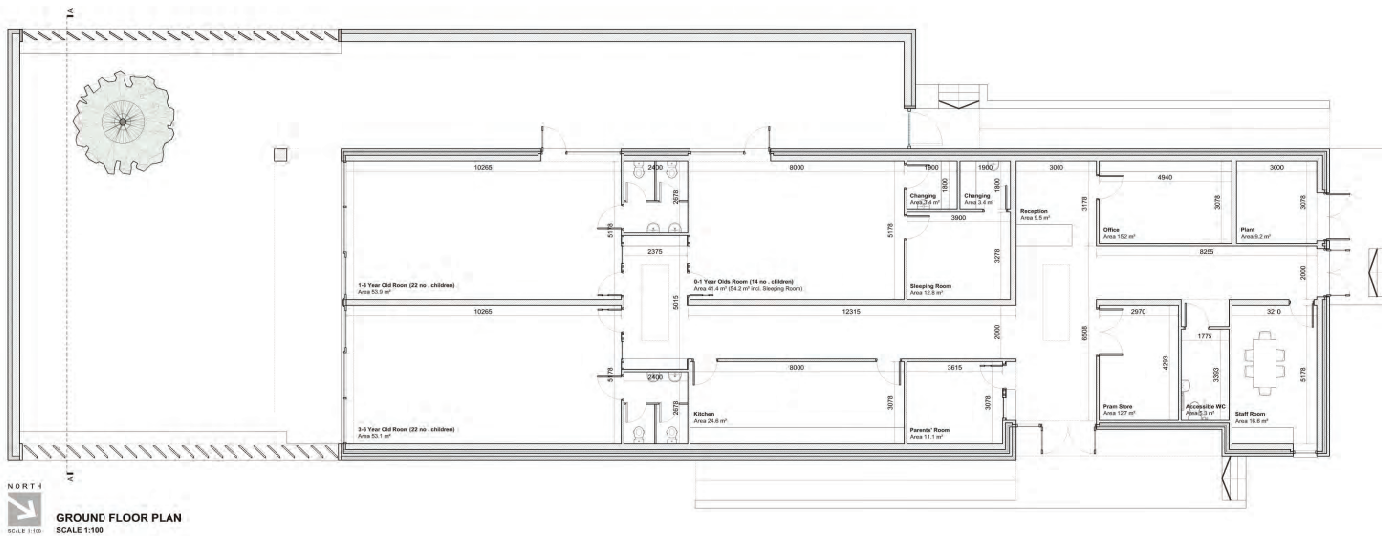
[illegible]

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name date description by

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Gulway
+30007 00000
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Thompson, Miss.
+0000000 000
Hickory, NC
Hickory, NC

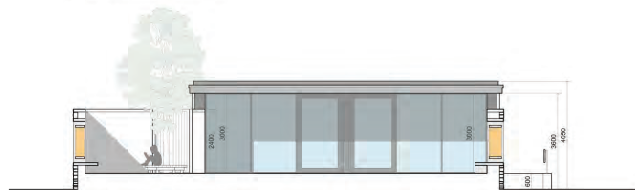


GROUND FLOOR PLAN
SCALE 1:100

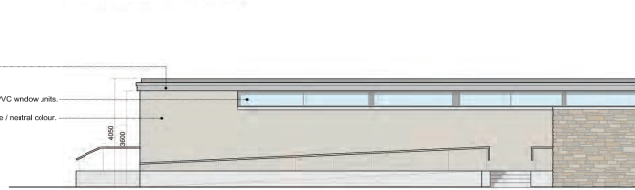
GRC / cut stone clill; window surrounds and coping on natural stone.

Coloured louvre panels to Architects detail.
Selected natural stone, random coursed, rousset pointing, minimum 150 mm thickness.

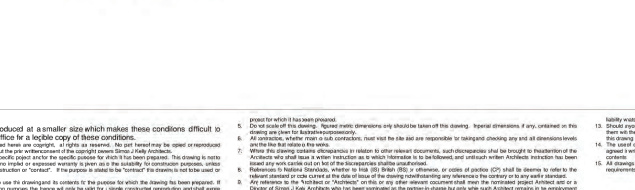
SOUTH WESTERN / FRONT ELEVATION
SCALE 1:100



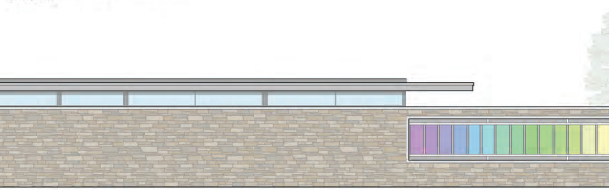
SOUTH EASTERN ELEVATION / SECTION AA
SCALE 1:100



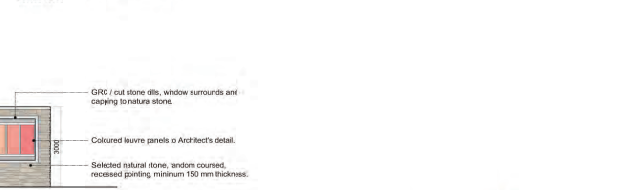
SOUTH WESTERN / FRONT ELEVATION
SCALE 1:100



NORTH WESTERN ELEVATION
SCALE 1:100



SOUTH EASTERN ELEVATION
SCALE 1:100



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PROJECT: Housing Development, Moneyduff, Oranmore, Co Galway		CLIENT: Adrian Itz	
DRAWING: Crèche		DRAWING BY: B.S	
General Arrangement Drawings		APPROVED: Feb. 2019	
Stage 3		DATE: Feb. 2019	
DRAWING SIZE: A1		DRAWING REFERENCE: 2325-P-026	
SCALE: 1:100		REV. NO.: -	

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PROJECT: Housing Development, Moneyduff, Oranmore, Co Galway			
CLIENT: Arlun Ltd			
DRAWING: Duplex Block 3 (36 to 41 inc.) General Arrangement Drawings			
DRAWING PURPOSE: Stage 3		DRAWN BY: B.S	APPROVED: E.T
DRAWING SIZE: A 1		SCALE: 1:100	DATE: Feb. 2
DRAWING REFERENCE: 2255, D.025			REV. NO

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by

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Appendix 3-2

Construction and Environmental Management Plan

Construction & Environmental Management Plan

**Residential Development,
Moneyduff,
Oranmore,
Co. Galway**

March 2019

Construction & Environmental Management Plan
Residential Development, Moneyduff, Oranmore, Co. Galway

CONTENTS:

1.0 Scope

2.0 Introduction

3.0 Site Access and Vehicles

4.0 Construction Methodologies

5.0 Environmental Issues

6.0 Mitigating Impacts on adjoining Properties: Control & Monitoring of Noise Dust and Vibration

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File Location: Document1

Job Ref:	Author	Reviewed By	Authorised	Issue Date	Rev No.
	AA			28/03/2019	1

Construction & Environmental Management Plan

Residential Development, Moneyduff, Oranmore, Co. Galway

1.0 Scope

We have been requested by our Client to prepare a Construction & Environmental Management Plan for the proposed development at Moneyduff, Oranmore, Co. Galway. The application is for a development consisting of 212 no. residential units comprising:

- 34 no. House Type A (four-bed semi-detached unit)
- 54 no. House Type B (three-bed semi-detached unit)
- 16 no. House Type C (four-bed detached)
- 16 no. House Type D (three-bed terraced unit)
- 24 no. House Type E (four-bed semi-detached unit with attic conversion)
- 50 no. House Type G (25 no. two-bed ground floor duplexes and 25 no. three-bed first/second floor duplexes)
- 6 no. House Type H (two-bed apartments)
- 12 no. house Type J (two-bed terrace)



Figure 1: Proposed Site Layout Plan

28/03/2019

It is anticipated that the development will be completed over 4 phases. The development also includes a one storey creche facility, associated car parking, surface water attenuation, landscaping and all associated site development works.

We have prepared this report to describe the proposed construction measures anticipated for the development, the impact to the site/surrounds and the proposed mitigation measures to be put in place to safeguard the development works. This report will be read in conjunction with the additional reports submitted by the design team in support of the application.

2.0 Introduction

The Proposed Moneyduff residential Development site, which is approximately 8.7 hectares, is located just outside Oranmore (approximately 500m from the town). The works will be completed over 4 phases, which will run for an overall length of approximately 42 months. Phase 1 will have 71 units, Phase 2 will have 52 units (+creche), Phase 3 will have 35 units, and Phase 4 will have 54 units.

2.1 Site Location

To the west of the development site is the site of a proposed hotel and 161 dwelling housing development which is not yet constructed. To the south of the development site is the site of another proposed 61 dwelling housing development, and to the north of the development site are existing housing developments, Beech Park and Coill Clocha. An agreement is in place between the applicant, Arlum Ltd, and the adjoining owner, for the construction of the access road from the existing roundabout (to the East of the site), the north-south road and the proposed roundabout where the two proposed roads meet. There are historic castle tower remains (GA 095-084) within the development site which are to be protected via an exclusion zone and will be incorporated within the public open space.



Figure 2: Oranmore town aerial image (Site shown in red).

3.0 Site Access and Vehicles

3.1 Hoarding

The site areas (phases 1 – 4) will be enclosed with a hoarding, details of which are to be agreed with Galway Co. Co. Hoarding panels will be maintained and kept clean for the duration of the project. The Contractor will be responsible for the security of the site. The Contractor will be required to undertake the following:

- Operate a Site Induction Process for all site staff,
- Ensure all site staff shall have current ‘Safe Pass’ cards,
- Install adequate site hoarding to the site boundary,
- Maintain Site Security staff at all times,
- Install access security in the form of turn-styles and gates for staff,
- Separate public pedestrian access from construction vehicular access,
- Ensure restricted access is maintained to the works.

3.2 Access Arrangements for Pedestrians

The Contractor will segregate all pedestrian and vehicular traffic on site, including at access points/ entrances. It is proposed that the pedestrian access will be via the new access road on the South-East of the site, with secured access controlled to the site via a biometric turnstile. The on-site segreg-gated pedestrian access way will include signage to direct pedestrians to the site compound and around the site.

3.3 Pedestrian and Cyclist Safety

Until such time as the construction of the first phase is complete, the new main access road (which runs parallel to the N67) will not be open to members of the public. However, the general public will have right of way along the roads and pathways on the existing N67. When vehicles are entering the site, or leaving the site, these movements will be supervised by road marshals. The construction site gates will be kept closed when not in use and monitored by security. Traffic cones and set-back signage will be put in place to warn and safely direct cyclists around obstructions.

3.4 Proposed Hours in which Vehicles Will Arrive and Depart

In general, the hours in which vehicles will arrive and depart will coincide with the expected site working hours of 8.00am to 7.00pm Monday to Friday, and 8.00am to 2.00pm on Saturdays.

3.5 Access Arrangements for Vehicles

The Contractor will submit a Traffic Management Plan (TMP) to Galway County Council Traffic Division prior to commencement of the works. The TMP defines the physical and legal limitations within which a person or persons can carry out development works that affect the existing nature of public roads, footpaths and the surrounding environment for a duration of time. The TMP is to be formulated in the style as specified in the statutory publications with reference to the publications “Traffic Management Guidelines” manual and the “Traffic Signs Manual”. The TMP will address the access routes which will be applicable to each of the phases.



Figure 4: Indicative Access Route

All deliveries and vehicles into site will access the site from the new access road which will be located on the eastern side of the site boundary, just off the N67 as per Figure 4 above.

The location of the vehicular entrance and access will be regularly reviewed during the construction to ensure that the pedestrian and vehicular access points are located and maintained appropriately.

3.6 Exclusion Zones on site

There are historic castle tower remains within the development site which are to be protected via a 20m exclusion zone. The 20m exclusion zone shall be fenced off from the site, and the contractor will not have any storage, plant, or traffic going inside this exclusion zone during the construction period. Suitable fencing will be erected to ensure the remains are protected and preserved during the construction period, and regular checks and inspections will be carried out on this by the contractor.

Similarly, the designated seminatural grassland area will become an exclusion zone. The area to be managed for seminatural grassland, will be fenced off during the construction phase of the site and only landscaping works, required for the management of the grassland, be undertaken within this area. There will be no temporary storage of construction materials within this area and no storage of fuels or other potential contaminants. The exclusion of machinery and materials from this area will also avoid compaction of the soils, maintaining a free draining calcareous substrate for seminatural grassland landscaping.

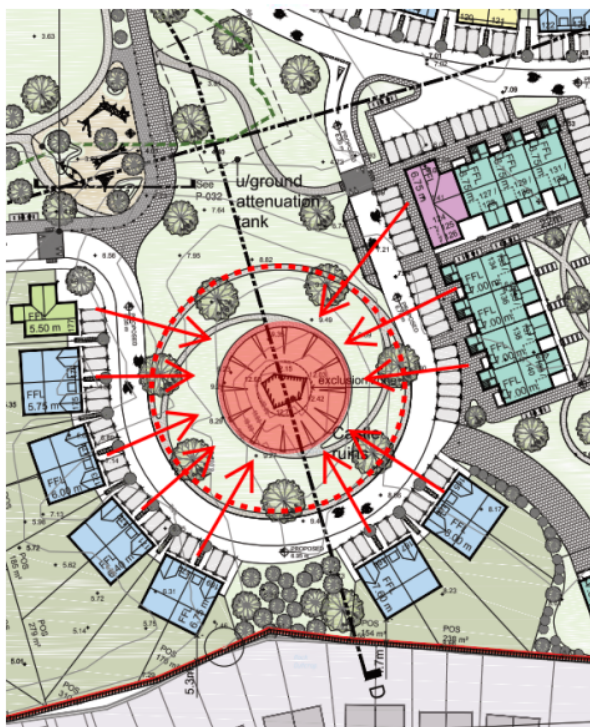


Figure 5: Focus on housing towards

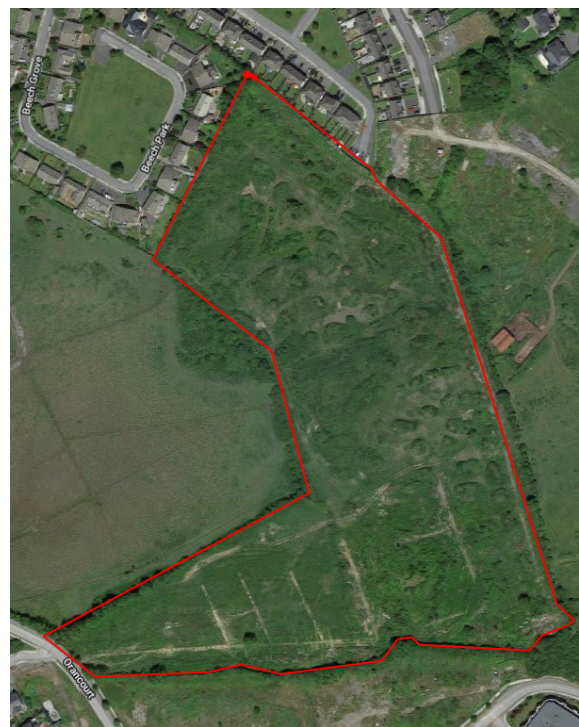


Figure 6 : Aerial photography of the site

3.7 Size of Vehicles

It is anticipated that there will be numerous types of delivery vehicles used to bring material to and from the site. These include:

Skip lorries. These will include roll on/roll off skips and standard yard skips for waste.

Spoil excavation.

Ready mix concrete lorries.

Flatbed delivery vehicles for the delivery of various material.

The appointed Contractor is to outline the projected vehicle movements during the course of the works.

3.8 Parking and Loading Arrangements

The Contractor will implement a delivery procedure to ensure that the surrounding area is not overrun with site and delivery vehicles.

A “Just in Time” approach will be required for the delivery of particular building materials such as concrete formwork and large structural steels.

Vehicles will be pulled into the site for unloading wherever possible.

Materials will be stored within the boundary of the site. However, these will not be stored within the designated area for seminatural grassland. There will be no temporary storage of construction materials within this area and no storage of fuels or other potential contaminants. The exclusion of machinery and materials from this area will also avoid compaction of the soils, maintaining a free draining calcareous substrate for seminatural grassland landscaping.

It is proposed to provide on-site car parking spaces during the construction.

3.9 Site Compound and Facilities

The Contractor shall provide site accommodation including suitable washing and dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc. Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure. The compound shall be constructed using a clean permeable stone finish and will be enclosed with security fencing.

3.10 Phasing

It is anticipated that the development will be completed over 4 separate phases. These access and egress routes will be addressed in more detail in the TMP (Traffic Management Plan), and the TMP will also address the issue of the site access routes running in tandem with the completed phases and its residence. As some of the houses will be occupied during the later phases, Traffic Management procedures will be implemented to ensure the safety of the users of the access routes, for both the residential access and the construction access.

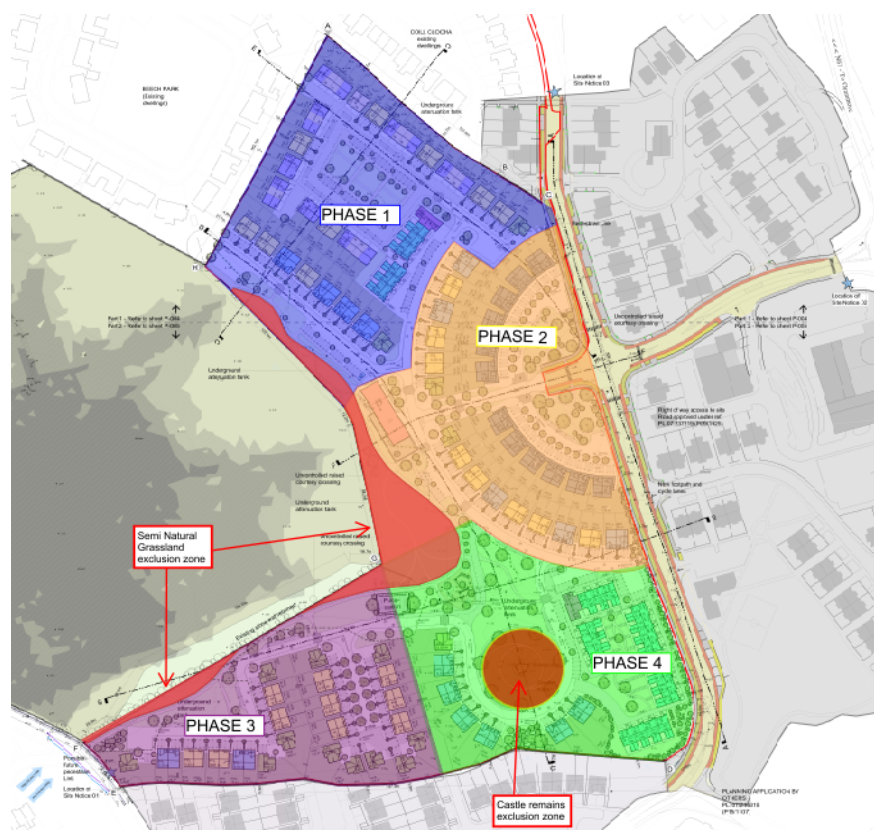


Figure 7: Phasing Plan

4.0 Construction Methodologies

This section describes the construction methodologies that will be used for the proposed housing development.

4.1 Soil Stripping & Temporary Stockpiling

During site preparation works, where topsoil is stripped prior to excavation, this material should be retained on site for use in landscaping within the seminatural grassland management areas. This material will be used for grading of the site, making it easy to manage and will contain a local seed bank for natural revegetation. Soil stripping and temporary stockpiling of soils and subsoils will be required around the site as the proposed development progresses. Where these works occur, the following will apply:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Bord Gáis, Eircom, Galway County Council etc. will be contacted and all drawings for all existing services sought.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- All plant operators and general operatives will be inducted and informed as to the identification of invasive species.
- A tracked 360-degree excavator will be used to strip the topsoil, and a dumper will be used to move the excavated materials to the temporary stockpile location.
- All excavated material which is not required for future landscaping works or for backfill of excavations will be removed to an authorised waste recovery facility. This will also apply to material which is not suitable for reuse on site.
- All stockpiles will be damped down or covered in a sheet of polythene, as required, which will prevent the creation of nuisance dust, and will also prevent sediment runoff in times of heavy precipitation.
- A silt filtration system will be used as appropriate to prevent contamination of any watercourse.

4.2 Temporary Site Compound

One temporary construction compound is proposed for the construction phase of the proposed development, located in the Phase 4 area. The proposed temporary compound area incorporates temporary site offices, staff facilities and car-parking areas.

A dedicated waste management area will be located within the compound, with waste to be sorted and collected from site by permitted collectors. Potable drinking water will be supplied via water coolers located within the staff facilities, which will be restocked on a regular basis as required during the construction phase. A supply contract will be set up with a water cooler supply company with water supplies delivered to site as required for the duration of the construction period.

Temporary port-a-loo toilets located within portacabins will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. Power will be supplied by a diesel generator, located within the compound. The construction compound will be used for temporary storage of some construction materials, prior to their delivery to the required area of the site.

4.3 Site Roads

The construction methodology for the proposed access road is outlined as follows:

- Excavation will take place until a competent stratum is reached.
- The competent stratum will be overlain with up to 500mm of granular fill.
- A layer of geogrid/geotextile may be required at the surface of the competent stratum.
- A final surface layer will be placed over the excavated road to provide a road profile to accommodate construction traffic.
- Prior to completion of the construction works on site, the finished road surface will be applied.

4.4 Excavation and Services Installation

Services will be required to each property in the proposed development. Where these are located, the following will apply:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Bord Gáis, Eircom, Galway County Council etc. will be contacted and all drawings for all existing services sought.
- A traffic management plan will be produced if required for connection works to the existing service network.
- A road opening licence will be obtained where required for connection to existing services.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the trench to the required dimensions.
- All excavated material will be removed to an authorised waste recovery facility or, if suitable, stock piled and reused for backfilling and landscaping where appropriate.
- Once the trench has been excavated the ducting/pipework will then be placed in the trench as per specification.
- Once the service ducts/pipework has been installed couplers will be fitted as required and capped to prevent any dirt etc. entering the ducts/pipes.
- The as built location of the ducting/pipework will be surveyed using a total station/GPS.
- Backfill material will be carefully placed so as not to displace the ducting/pipework within the trench.
- The appropriate warning/marker tape will be installed above the ducts/pipes at the appropriate depths.
- The surface will be reinstated as per original specification or to the requirements of the site layout/Local Authority as appropriate.

4.4.1 Existing Underground Services

Any underground services encountered during the works will be surveyed for level and where possible will be left in place. If there is a requirement to move the service, then the appropriate body (ESB, Gas Networks Ireland, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

4.5 House/Building Construction

The buildings will be constructed by the following methodology:

- The area where excavations are planned will be surveyed and all existing services will be identified.
- All relevant bodies i.e. ESB, Bord Gáis, Eircom, Galway County Council etc. will be contacted and all drawings for all existing services sought.
- The area of each building will be marked out using ranging rods or wooden posts and the soil and overburden stripped and removed to nearby storage area for later use in landscaping. Any excess material will be sent to an authorised recovery facility.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- A tracked 360-degree excavator or similar will be used to excavate the area down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it;
- The block work walls will be built up from the foundation (including a DPC) and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the buildings for this operation;
- Any concrete slabs will be lifted into position using an adequately sized mobile crane;
- The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- Windows, electrics, plumbing and all other building components and services will be installed in as timely a manner as is possible.
- Each building will be inspected and certified by an engineer at the appropriate stages of construction.

4.6 Construction Site Management Incorporated into Project Design

The following measures pertaining to water quality and invasive species have been incorporated into the design phase of the project to avoid effects on sensitive ecological receptors.

4.6.1 Prevention Pollution Control Measures

The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides guidance. This will ensure that surface water arising during the course of construction activities will contain minimum sediment. The following methods and best practice measures will ensure that sediment release and potential for pollution during the construction phase is minimised and reduced to insignificant:

Drainage

The proposed development site does not contain any mapped watercourses and no watercourses were identified within the site during site visits. The Millpot Stream, located to the west of the proposed site, flows west away from the development to Oranmore Bay in excess of 295m downstream. However, the following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering the wider environments including downstream watercourses.

- There will be no release of suspended solids to any watercourse as a direct or indirect result of the proposed works. There is no surface watercourse on the site of the proposed development.
- No watercourse will be interfered with as part of the proposed works. No temporary instream crossings or temporary culverting will take place. Instream works will not take place.
- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered;

- As construction advances there may be a small requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground or disperse by diffuse flow into local drainage ditches;
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing

Hydrocarbons

The use of hydrocarbons during the construction process can result in the potential for pollution and accidental spillage to enter natural watercourses downstream of the site via surface runoff and groundwater. The following measures have been built into the construction design phase of the project.

- On site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site by a 4x4 jeep to where machinery is located. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- Fuels stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction;
- The plant used should be regularly inspected for leaks and fitness for purpose; and,

The following guidelines and documents will inform the detailed planning of the works phase:

-

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA) in particular;
- C532 Control of water pollution from construction sites: guidance for consultants and contractors (Masters-Williams et al, 2001); and

- SP156 Control of water pollution from construction sites - guide to good practice (Murnane et al, 2002).
- Requirements for the protection of fisheries habitat during construction and development works at river sites developed by the ERFB.
<http://www.fisheriesireland.ie/Research/recent-publications.html>.

4.7 Landscaping works

Prior to completion of works on the development site, the landscaping works will be carried out. The proposed landscaping plan is shown as Drawing 18223_3_100 REV E (Landscape Master Plan) in Appendix 3-1. The finishes include areas of designated seminatural grassland, amenity grassland, footpaths and tree planting. This work will be carried out before the completion of each phase in order to ensure that the development will be aesthetically pleasing place for residents to live. These works will involve the use of plant and machinery in order to carry out tasks such as earth moving. Materials which have been stockpiled for the task will be used as much as possible, and material will only be imported where it is required. During site preparation works, where topsoil is stripped prior to excavation, this material will be retained on site for use in landscaping within the seminatural grassland management areas. This material will be used for grading of the site, making is easy to manage and will contain a local seed bank for natural revegetation.

4.8 Invasive Species

The introduction and/or spread of invasive species such as Japanese Knotweed and Himalayan Knotweed for example, could result in the establishment of the species and this may have knock on effects on the surrounding environs.

Appropriate control measures will be incorporated into the design and construction phase of the development to ensure that the relevant measures (outlined in the following section below) will be implemented.

4.8.1 Control Measures for the Management of Invasive Species

Invasive species, such as Japanese Knotweed, Himalayan Knotweed, Himalayan Balsam, *Gunnera*, and Giant Hogweed pose a serious threat to biodiversity and the health of native vegetation types. Construction machinery can act as a vector for the spread of these plants. Machinery that has worked at an infected site is likely to cause the spread of such species by transferring their tiny seeds or plant fragments, in soil trapped in their tyre tread for instance. Equally, they can cause the spread of species within a site. The duration of the impact could be short-term or permanent depending on whether or not an eradication effort is made but once established, eradication is time-consuming and expensive. Himalayan Knotweed, for example,

propagates vegetatively, forming a new plant from even very small plant fragments. Thus, there is a high risk of causing the spread of this species to other parts of the site. The UK Environment Agency's '*Japanese Knotweed Code of Practice*' provides guidance on managing Japanese Knotweed and Himalayan Knotweed on development sites. A number of control measures have been drawn up and included in the design and construction phase of the proposed works to avoid the introduction and spread of invasive plant species. The following project design elements have been devised to avoid such effects. The following measures address potential effects associated with the construction phase of the development:

- All earthworks machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere.
- Care will be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally.
- There are not believed to be any existing stands of invasive species on site, but should any be found, they will be clearly demarcated by temporary fencing and tracking within them will be strictly avoided. A minimum buffer of seven metres will be applied to avoid disturbance of lateral rhizomes.
- If any excavations must be carried out in areas of Japanese Knotweed, the excavated material will not be moved from the location. The machinery must be thoroughly pressure-washed in a designated area at least 25 metres from any watercourse before moving on to an area that is not yet infected.
- All contractors and staff will be briefed about the presence, identification and significance of Japanese Knotweed before commencement of works.
- Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly washed prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species such as Japanese Knotweed and Rhododendron. All washing must be undertaken in areas with no potential to result in the spread of invasive species.
- When working at locations in proximity to natural watercourses, a suitable barrier will be erected between the watercourse and the stand of invasive species. This will assist in preventing the spread of any invasive species into the watercourse during their removal. There are no watercourses on the proposed development site, but cognizance will be had of any watercourses on neighbouring sites.

- Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the 'Third Schedule' of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material.
- Any soils or subsoils contaminated with invasive species will sent for disposal to an authorized waste facility.

The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority – *The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads* (NRA 2010) and the Environment Agency (2013) – *The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites* (Version 3, amended in 2013).

5.0 Environmental Issues

5.1 Waste Management

The treatment of waste is to be employed by the contractor or a specialist waste management contractor as a trade package. This contractor is responsible for:

- Ensuring the site is kept clean and safe
- The collection of waste from a central point
- Segregation of waste on site.

The waste management contractor will ensure that all access routes, fire escapes and staircases are swept and kept clear of debris on a regular basis to maintain high standards of health and safety on the project.

The Contractor will prepare a Construction Waste Management Plan in accordance with the “Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects” (Department of Environment, Heritage and Local Government, 2006) and ensure that all material is disposed of at an appropriately licensed land fill site. The Contractor will also outline detailed proposals within the Traffic Management Plan to accommodate construction traffic.

In order to ensure appropriate segregation of waste on site, a material storage zone will be provided in the compound area. This storage zone will include material recycling areas and facilities. A series of ‘way finding’ signage will be provided to route staff and deliveries into the site and to designated compound or construction areas, as appropriate.

5.2 Dust

Dust prevention measures shall be included for control of any site airborne particulate pollution. The Contractor shall put in place and monitor dust levels in the vicinity using a Bergerhoff gauge instrument. The minimum criteria to be maintained shall be the limit for Environmental Protection Agency (EPA) specification for licensed facilities in Ireland, which is 350mg/m²/day. The Contractor shall continuously monitor dust over the variation of weather and material disposal to ensure the limits are not breached throughout the project. Dust suppression systems will be implemented if required based on the continuously monitored dust levels.

5.3 Noise

The Contractor will be required to monitor base noise levels at the site location before commencement of the project. Noise monitoring will be required throughout all phases of the project. Variation of noise levels from those experienced as part of everyday life in an area can result in extreme disruption. The Contractor shall implement measures to eliminate where possible and reduce noise levels where not. Noise levels shall be kept below those levels specified in the National Roads Authority – “Guidelines for the Treatment of Noise and Vibration in National Roads Schemes” or such further limits as imposed by Galway County Council. The proposed development shall comply with BS 5228 “Noise Control on Construction and open sites Part 1: Code of practice for basic information and procedures for noise control.”

Construction equipment for use outdoors shall comply with the European Communities Regulations— Noise Emission by Equipment for Use Outdoors – SI 241 - 2006.

5.4 Vibration

If work activities have the potential to result in vibration, the appointed contractor shall source vibration monitoring equipment immediately from a specialist company who specialise in monitoring equipment.

5.5 Harmful materials

Harmful materials shall be stored on site for use in connection with the construction works only. These materials shall be stored in a controlled manner. Where on site fuelling facilities are used, there shall be a bunded filling area using a double bunded steel tank at a minimum. No materials to be stored in the designated seminatural grassland area or within the castle remains exclusion zone.

5.6 Road Cleaning and Wheel Washing

The Contractor will make provision for the cleaning by road sweeper etc. of all access routes to and from the site during the course of the works as required. It is intended that cleaning shall be undertaken on a daily basis during the excavation works and as required thereafter. A wheel wash facility will be provided on site to clean site traffic leaving the site. Waste water generated at this washing facility will be suitably treated on site and all settled silts disposed offsite to licensed landfill. All road sweeping vehicles will be emptied off site at a suitably licensed facility as per our construction stage environmental waste management document.

6.0 Mitigating Impacts on adjoining Properties: Control & Monitoring of Noise Dust and Vibration

In conjunction with the above mentioned Environmental Factors, the following mitigation measures will be taken to minimise impact on adjoining properties:

6.1 Noise:

To mitigate the impact on adjoining properties, the appointed contractor shall;

- Consider alternative methods of work which will eliminate or reduce exposure.
- Choose appropriate equipment, emitting the least possible noise levels.
- Provide operatives with adequate information, instruction and training on the equipment being used.
- Consider noise reduction by technical means.
- Organise work to reduce by limiting duration and intensity or exposure, and appropriate work schedules with rest periods.
- Plant and machinery selection will ensure that noise controls are fitted and that the machinery is serviced regularly to ensure they are fit for use.

Random monitoring (if required) shall be undertaken at the site boundary, by the use of a Sound Level Meter which has the capabilities to store data and produce records and issued to the appropriate parties upon request.

6.2 Dust:

Dust control will be achieved by:

- Dampening down the dust at the source
- By the use of barriers such as debris netting on scaffolding around the building to block dust escaping where the building is within 10m of the site boundary where residential properties exist.
- Site road ways will be maintained in a stoned hard core condition not allowing soil to accumulate which when dry can create dust.

- Wheel wash equipment will be set up at the site exit gate for all construction vehicles to pass through prior to leaving the site thus ensuring that no dirt etc. is transported outside the site onto the roadways.
- Plant and equipment that have the potential to create volumes of dust will have appropriate attachments to allow water source to dampen dust to not allow it to get airborne.
- Deploy Road Sweeper as required on External Roads.

6.3 Vibration:

If work activities have the potential to result in vibration, the appointed contractor shall source vibration monitoring equipment immediately from a specialist company who specialise in monitoring equipment. All heavy vibration works will be kept outside the exclusion zones for the historic castle and seminatural grassland management area.

6.4 Mitigation Measures

6.4.1 Site Planning

- Erect solid barriers to site boundary.
- No fires
- Plan site layout – machinery and dust causing activities will be located away from sensitive receptors.
- All site personnel to be fully trained
- Hard surface site haul routes
- Put in place dust monitors across site if required

6.4.2 Construction traffic / Plant

- All vehicles to switch off engines when not in use – no idling vehicles
- Effective vehicle cleaning and wheel washing on leaving site and damping down of haul routes
- No site runoff of water or mud.

- On-road vehicles to comply to set emission standards.
- All non-road mobile machinery (NRMM) to be fitted with appropriate exhaust system and be regularly serviced.
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site

6.4.3 Site Activities

- Minimise dust generating activities
- Use water as dust suppressant where applicable
- Cover, or fence stockpiles to prevent wind whipping
- Debris netting to be erected to perimeter scaffolding if within 10m of neighbouring residential buildings

Appendix 3-3

Landscape Plan

INDICATIVE PLANTING SCHEDULES / SPECIES LISTS

PARKLAND TREE PLANTING	
Species	Specification
(Ah) Aesculus hippocastanum	18-20cm girth / clearstem / rootball or airpot
(Cd) Cedrus deodara	1-2m high / rootball or airpot
(Cd) Cedrus libani	1-2m high / rootball or airpot
(F) Fagus sylvatica	18-20cm girth / clearstem / rootball or airpot
(Qp) Quercus petraea	18-20cm girth / clearstem / rootball or airpot

STREET TREE PLANTING	
Species	Specification
(Bp) Betula pendula	8-10cm girth / clearstem / rootball or airpot
(Pc) Pyrus calleryana 'Chanticleer'	8-10cm girth / clearstem / rootball or airpot
(Sa) Sorbus aria	8-10cm girth / clearstem / rootball or airpot
(Sa) Sorbus aucuparia	8-10cm girth / clearstem / rootball or airpot
(Tc) Tilia cordata 'Greenspire'	8-10cm girth / clearstem / rootball or airpot

NATIVE GRASSLAND TREE PLANTING	
Species	Specification
(Bp) Betula pendula	8-10cm girth / clearstem / rootball or airpot
(Sa) Sorbus aucuparia	8-10cm girth / clearstem / rootball or airpot

NATIVE WOODLAND TREE & UNDERSTORY SCREEN PLANTING	
Species	Specification
(Ag) Alnus glutinosa	10-12cm girth / clearstem / rootball or airpot
(Bp) Betula pubescens	10-12cm girth / clearstem / rootball or airpot
(Ps) Pinus sylvestris	1m high rootball / airpot
(Qp) Quercus petraea	10-12cm girth / clearstem / rootball or airpot
(Ul) Ulmus lobei	10-12cm girth / clearstem / rootballed or airpot
Corylus avellana	1+2 br transplant / 60-90cm
Ilex aquifolium	3l pots / 20-30cm
Prunus spinosa	1+2 br transplant / 60-90cm
Viburnum opulus	1+2 br transplant / 60-90cm

CLIPPED HEDGING		
Species	Specification	Quantity
Fagus sylvatica	1+2 bareroot transplants / 60-90cm	6 per lin.m
Carpinus betulus	1+2 bareroot transplants / 60-90cm	6 per lin.m

LOW HEIGHT SHRUB MIX - indicative schedule;		
Species	Spec	Density
Cotoneaster decorus	2l pot	3/sqm
Clematis lucifer	2l pot	3/sqm
Hypericum hidcote	2l pot	3/sqm
Lavandula angustifolia	2l pot	3/sqm
Prunus laurocerasus 'Zabelliana'	2l pot	2/sqm
Rosa 'Flower Carpet' (White)	2l pot	3/sqm
Stipa tenuissima 'Pony Tails'	2l pot	4/sqm
Viburnum davidii	2l pot	3/sqm



Note: All street trees semi mature clearstem with minimum canopy height of 2m maintaining sightlines.
Raised pedestrian crossing points

Public parkland open space for passive recreation with specimen parkland and native tree planting

Where present existing drystone wall / boundary vegetation to be retained.

Proposed area of open grassland adjoining SAC to be allowed to naturally regenerate & where appropriate supplemental native wildflower & grass seeding may occur. (Dashed line indicates mown pedestrian pathways).

Pumping station with 1.5m high stone clad wall with hedging around outside perimeter

Existing boundary vegetation to be retained where present

Existing standing drystone wall to be retained.

Proposed area of open grassland adjoining SAC to be left to naturally regenerate.

Homezone shared surface area incorporating communal garden

LEGEND

- Specimen Parkland Trees
- Large Species Street Trees
- Small Species Street Trees
- Medium Street Tree in grille / planter
- Native Woodland & Parkland Trees
- Native Woodland Understory Trees & Shrubs
- Existing boundary vegetation retained (locations indicative).
- Low Height ornamental shrub mix
- Medium height ornamental shrub mix
- 1.2m high clipped formal hedging
- Grass Lawn (Public Open Space)
- Private Garden Space
- Wildflower Meadow Grass
- Pedestrian Priority Homezone / Shared Surface Permeable Paving Setts
- Footpaths & Layby Permeable Paving Setts
- Brushed Concrete or Tarmac Footpaths
- Timber edged gravel footpath
- Brushed Concrete or Tarmac Parking Bays
- Cycle Racks
- Bollards
- Line of R&A zoning
- Site Boundary

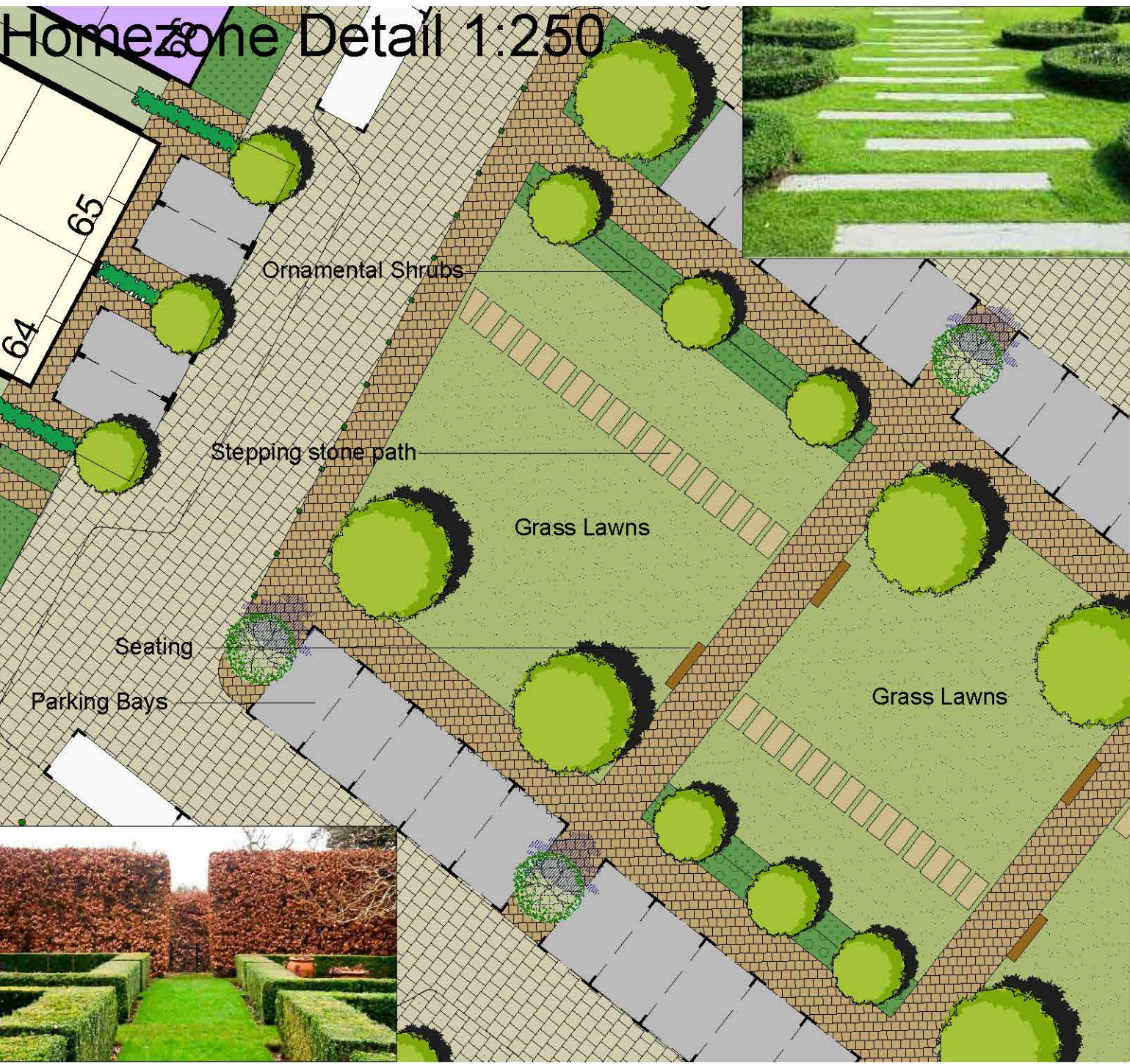
Public parkland open space for passive recreation with specimen parkland and native tree planting

Hierarchy of street tree planting (small)
Hierarchy of street tree planting (large)
Hierarchy of street tree planting (medium)

Archaeological protection zone around ruins - voids to be infilled with topsoil to make safe loose rocks with upper surfaces left exposed before seeding with wildflower meadow grass and minimally invasive timber edge gravel pathways installed.

Native woodland canopy & understory planting

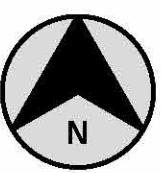
Native woodland canopy & understory planting



A	14.06.18	LAYOUT
REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS
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PROJECT: MONEYDUFF ORANMORE CO. GALWAY	DATE: FEBRUARY 2018
DRAWING: LANDSCAPE MASTER PLAN (PLANNING DRAWING ONLY)	SCALE: 1:500 @ A0
	DRAWN: CHECKED: KM KM
	DRAWING NO: 18223-3-100

Appendix 3-4

Habitat Management Plan

Habitat Management Plan

**Moneyduff Strategic Housing Development
Co. Galway**



Planning & Environmental Consultants

DOCUMENT DETAILS

Client: Arlum Ltd.

Project title: Moneyduff Strategic Housing Development

Project Number: 181044

Document Title: Habitat Management Plan

Doc. File Name: HMP F – 2019.04.02 – 181044

Prepared By: McCarthy Keville O’Sullivan Ltd.
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Table of Contents

1	INTRODUCTION	1
2	Background	1
2.1	Statement of Authority.....	2
3	Ecological Baseline	3
3.1.1	Significance of Habitats	7
4	Management and Enhancement Measures.....	9
4.1	Construction Phase Measures.....	9
4.2	Grassland Management and Enhancement.....	9
4.2.1	Semi-Natural Dry Calcareous and Neutral Grassland Management.....	9
4.2.1.1	Mowing regime	10
4.2.2	Facilitating Community Access to the Grassland.....	10
4.2.3	Schedule of Actions.....	12
4.3	Hedgerow Enhancement and Retention of Stone Walls	14
4.3.1	Hedgerow enhancement.....	14
4.3.2	Stone Wall Retention.....	15
4.3.3	Consideration of Policies and Objectives of local development and conservation plans	15
4.4	Public Information Signage	15
5	Conclusion.....	18
6	References	19

1 INTRODUCTION

McCarthy Keville O'Sullivan (MKO) was commissioned to prepare a Habitat Management Plan (HMP) for a dedicated Biodiversity Enhancement Area proposed as part of the Moneyduff Strategic Housing Development, located in Oranmore, Co. Galway. This HMP focuses on habitats and species of conservation importance and outlines measures for enhancement, management and monitoring. These measures will be implemented as part of the overall Operational Management Plan for the development.

2 BACKGROUND

This report describes the biodiversity management and enhancement measures to be implemented within the land ownership boundary for the proposed development lands, Moneyduff, Oranmore, Co. Galway. This document has been prepared to take into consideration the Landscape Management Plan, which has also been informed in consultation with the project ecologists. The site location is provided in Figure 1.1.

The proposal is for the construction of a housing estate comprising 212 residential houses, amenity areas a creche and associated parking facilities. The proposed development will consist of the following:

- 1) Construction of 212 no. residential units comprising:
 - 34 no. House Type A (four-bed semi-detached unit)
 - 54 no. House Type B (three-bed semi-detached unit)
 - 10 no. House Type C (four-bed detached)
 - 16 no. House Type D (three-bed terraced unit)
 - 24 no. House Type E (four-bed semi-detached unit with attic conversion)
 - 6 no. House Type F (four-bed detached unit)
 - 50 no. House Type G (25 no. two-bed ground floor duplexes and 25 no. two-bed plus study first/second floor duplexes)
 - 6 no. House Type H (two-bed apartments)
 - 12 no. house Type J (two-bed terrace)
- 2) Development of a crèche facility (206 sqm) and associated outdoor play areas and car parking.
- 3) Provision of new vehicular and pedestrian site access from the North-South Oranmore Distributor Road (the route of which was permitted under An Bord Pleanála Reference PL 07.237219, which was extended under PL Ref 15/1334).
- 4) Provision of shared communal and private open space, site landscaping, car parking, site services and all associated site development works.

The proposal layout is provided in drawing number 2325-P-003.

The project design includes an assigned construction footprint within which, all development works will be undertaken. Also included within the site boundary is a dedicated Biodiversity Enhancement Area (see Figure 4.1), in which semi-natural dry calcareous and neutral grassland will be managed. No development works will be permitted within this area. Furthermore, this enhancement area will be actively managed to enhance biodiversity. Measures to achieve this is the subject of this HMP.

The habitats on site currently comprise of scrub, dry calcareous and neutral grassland, hedgerows, stone walls and other stonework, spoil and bare ground and wet grassland.

Although this Biodiversity Management Plan (BMP) for the proposal has been designed to secure the management of semi-natural dry calcareous and neutral grassland within the western portion of the land ownership boundary, the plan also provides additional measures for enhancing biodiversity to help maintain connectivity between habitats within the site and the wider landscape. The plan provides for the erection of public information signage to inform the public of the species to be found within the site as well as the ongoing management measures being implemented. The lands within the ownership boundary will also continue to be accessible to the public.

The plan considers the national Biodiversity Action Plan (BAP) 2017-2021 priorities, which although relate to broader strategies, aims to prevent biodiversity degradation and provide enhancement where opportunities exist. There is currently no formal county Biodiversity Action Plan for Co Galway. However, a draft Galway County Biodiversity & Natural Heritage Plan 2017 – 2022 is available and was reviewed as part of this assessment. The HMP provide a framework for ensuring compliance with the following County Development Plan (CDP) and Oranmore Local Area Plan 2012-2022 Policies and Objectives:

County Development Plan

- Policy NHB 1 – Natural Heritage and Biodiversity
- Objective NHB 2 – Biodiversity and Ecological Networks
- Objective NHB 11 – Trees, Parkland/Woodland, Stonewalls and Hedgerows

Oranmore Local Area Plan 2012-2022

- Policy NH 1 – Natural Heritage, Landscape and Environment
- Objective NH 5 – Biodiversity & Ecological Networks
- Objective NH 9 – Trees and Hedgerows
- Objective NH 11 – Summer Botanical Survey for Lands at Moneyduff

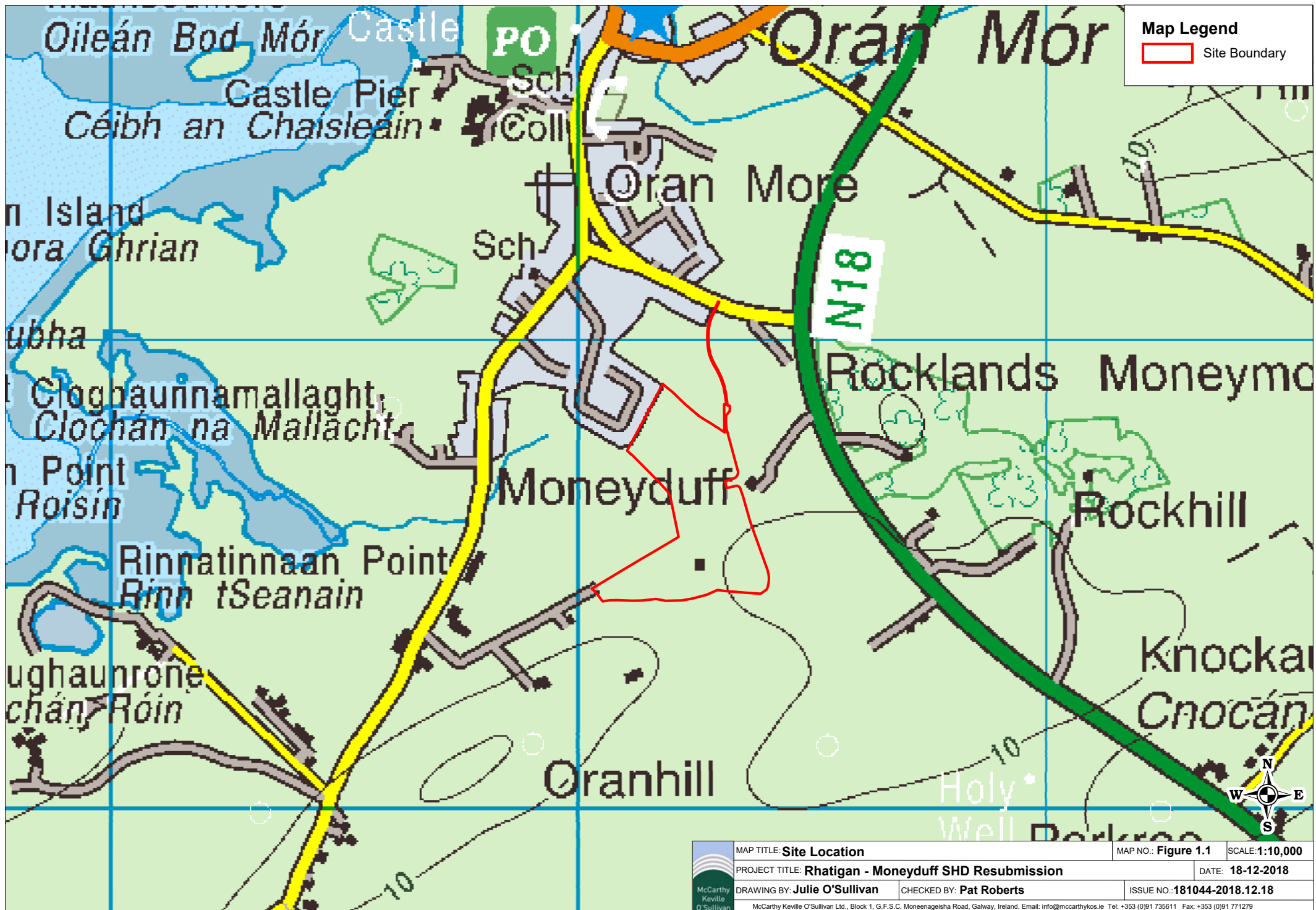
The main habitats/features identified for future management/ enhancement include:

- Semi-natural dry calcareous and neutral grassland,
- Hedgerows,
- Stone walls.

In addition to the above, public education, awareness and engagement will also be a key component of the management plan as public buy-in will ensure the long-term overall success of the plan. These measures will be implemented as part of the overall Operational Management Plan for the development.

2.1 Statement of Authority

This report has been prepared by David McNicholas (B.Sc, M.Sc, MCIEEM) of McCarthy Keville O'Sullivan Ltd. David is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over 8 years professional ecological consultancy experience. Detailed botanical surveys of the site were undertaken by Dr. Pamela Boyle (B.Sc, Msc, PhD) and James Owens (B.Sc, M.Sc,). This report has been reviewed by Pat Roberts (B.Sc. Environmental Science, MCIEEM) who has over 12 years' experience in management and ecological assessment.



3 ECOLOGICAL BASELINE

Dedicated habitat surveys of the proposed development were undertaken on the 8th of September 2016 and the 16th of August 2017. Habitats within the site were classified according to the guidelines set out in '*A Guide to Habitats in Ireland*' (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. The site was walked systematically and 2m x 2m relevés were conducted in areas of potentially sensitive habitat areas. The presence or signs of birds, mammals, amphibians and reptiles were noted during the visits.

The field surveys were conducted in September 2016 and mid-August 2017 which is within an adequate survey period for grassland habitat (May – June/Aug – Sept) (O'Neill *et al*, 2013). Therefore, it is concluded that the habitats and species that could potentially be impacted by the proposed development were adequately assessed during the survey period and a thorough and comprehensive ecological assessment was achieved. Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic nature) was assessed.

A total of six habitats were recorded within and directly adjacent to the site of the proposed development (Table 3.1)

Table 3.1 - Habitats recorded within the proposed development boundary (Fossitt, 2000).

Habitat	Code
Scrub	WS1
Dry calcareous and neutral grassland	GS1
Hedgerow	WL1
Stone walls and other stonework	BL1
Spoil and bare ground	ED2
Wet grassland	GS4

The site is subject to grazing management. However, no animals were present at the site on the days of the site surveys. This field appears to have been subject to some reclamation in recent years and is heavily grazed, supporting a short sward with some areas of bramble (*Rubus fruticosus* agg.) and blackthorn (*Prunus spinosa*) scrub.

The larger eastern section of the site was found to be predominantly overgrown by **Scrub (WS1)** species including blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus* agg.) and bracken (*Pteridium aquilinum*) with some ash (*Fraxinus excelsior*), willow (*Salix* spp.), whitebeam (*Sorbus aria*) and alder (*Alnus glutinosa*) trees becoming established across the site. Plate 3.1 provides an example of scrub habitat within the site.

Interspersed throughout the areas of scrub were grassland habitats classified as **Dry Calcareous and Neutral Grassland (GS1)** on thin soils with some bare limestone rock visible in parts. Common species included common knapweed (*Centaurea nigra*), oxeye daisy (*Leucanthemum vulgare*), selfheal (*Prunella vulgaris*), red clover (*Trifolium pretense*), crested dog's-tail (*Cynosurus cristatus*) and sweet vernal-grass

(*Anthoxanthum odoratum*). This habitat corresponds to the Annex I habitat “Semi-natural dry grasslands (*Festuco-Brometalia*) [6210]” (O’Neill et al., 2013). This community type is characterised by a wide variety of grasses and herbs, in which there is a moderate representation of calcicolous species (i.e. species with a preference for calcium rich soils). Details of the vegetation composition are provided in Appendix 5-2 of this EIAR. Nine discrete mappable areas of this habitat type were identified within the site from the 2016 and 2017 surveys period. This equates to approximately 0.89 hectares or 10.3% of the development area. The areas mapped during the site visits range from 0.003 – 0.33 hectares in size. The 2017 survey found that all the areas classified in 2016 still correspond to Annex I habitat and found that an additional three areas also conformed to this Annex I quality habitat. Similar habitat also occurred interspersed within the areas of scrub. Plate 3.2 & Plate 3.3 provide examples of semi – natural dry grassland to the east and south east of the site with surrounding encroaching scrub. The southwestern portion of the site comprises a mosaic of ***Wet Grassland (GS4)*** and ***Dry Calcareous and Neutral Grassland (GS1)*** and is grazed by horses and cattle.

A small area within the northern part of the site, that will form part of the site access road, comprises ***Spoil and Bare Ground (ED2)***.



Plate 3.1: Example of scrub habitat within the site.



Plate 3.2: Example of semi – natural dry grassland in the eastern and south eastern sections of the site with surrounding encroaching scrub.



Plate 3.3: Example of scrub encroaching on semi – natural dry grassland habitat to the east of the site.

In addition to the habitats recorded within the site boundary, as provided in Table 3.1, habitats in the wider area comprised of *Buildings and Artificial Surfaces (BL3)* to the south and north, *Semi-improved Agricultural Grassland (GA1)* to the east, *Hedgerows (WL1)*, *Treelines (WL2)* and *Rich Fen (PF1)* to the west.



Plate 3.4: Example of Buildings and Artificial Surfaces (BL3) surrounding the north of the site



Plate 3.5: Example of Buildings and Artificial Surfaces (BL3) surrounding the south and southwest of the site

An Alkaline fen (**Rich Fen PF1**) habitat is present adjacent to the western boundary of the site and within the boundary of Galway Bay Complex SAC (Plate 3.6 and Plate 3.7). This fen was the subject of dedicated botanical surveys. This habitat has been degraded

by artificial drainage (Plate 3.7) but still supports Annex I Alkaline Fen (7230) habitat. A thin strip of wet grassland (GS4) surrounds the fen and buffers it from the site of the proposed development (Plate 3.6). Sections of this grassland correspond to the Annex I habitat *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*) (6410). There is a network of drainage ditches (FW4) (Plate 3.7) within the fen. These provide hydrological connectivity with Galway Bay to the west.



Plate 3.6: Photo of Feb (PF1), left of photo, and wet grassland (GS4), right, bordering the west of the development boundary.



Plate 3.7 Photo of drainage within the Feb (PF1), outside the west of the development boundary.

3.1.1 Significance of Habitats

The field surveys found no evidence of botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC) or listed in the Irish Red Data Books. All plant species recorded are common in the Irish landscape and no invasive species were recorded on the site.

The surveys found that the site supports discontinuous sections of EU Habitats Directive Annex I habitat – *Semi-natural dry grasslands and scrubland facies on*

calcareous substrates (Festuco – Brometalia). These were dispersed throughout the site, primarily within fields in the eastern, northeastern and southeastern sections of the development boundary. The total combined area of Annex I habitat covers a small proportion of the site, 0.89 hectares or 10.3% of the development area (8.7ha). These areas occur in disjointed patches which are threatened by scrub encroachment. Given the nature and extent of scrub encroachment surrounding the smaller areas, they are not considered to be 'viable areas' of Annex I habitat (NRA, 2009b) and are continually decreasing in size through lack of management. The habitat patches are assigned **Local Importance (Higher Value)** because of their fragmentation and degradation through scrub encroachment.

The Hedgerows (WL1) and Scrub (WS1) represent semi-natural habitats which provide cover and commuting corridors for a variety of local flora and fauna and are of **Local Importance (Higher Value)**. Wet grassland (GS4) habitat and dry calcareous and Neutral Grassland (GS1) mosaic that is located in the southwest corner of the site is of **Local Importance (Lower Value)**.

The fen habitat outside of the site boundary to the west of the site is within the boundary of Galway Bay Complex SAC and is a designated qualifying interest of the SAC. Although degraded it corresponds to Annex I 'Alkaline Fen' habitat and is of **International Importance**.

4 MANAGEMENT AND ENHANCEMENT MEASURES

The following subsections describe the habitat management measures that will be undertaken at the proposed development lands at Moneyduff, Oranmore, Co. Galway. The measures are practical and easy to maintain for the future. This is important in achieving cost effective and relevant management actions. Given the floristically diverse semi-natural dry calcareous and neutral grassland habitat recorded within the land ownership boundary, management options are focused on the management and enhancement of grassland habitat as well as maintaining public access/walking paths around the margins of this managed amenity space. The plan also focuses on hedgerow management and enhancement options.

4.1 Construction Phase Measures

As shown in the landscaping plan for the proposed housing development (see Figure 18223 – 3 – 100) and in Figure 4.1, a large strip of the western portion of the site has been set aside for semi-natural dry calcareous and neutral grassland management, in addition to other green spaces for local amenity use. As this area already contains a suitable substrate and profile for semi-natural dry calcareous and neutral grassland management and enhancement, the following measures will be implemented during the construction phase of the development for the protection of the area adjacent to the development footprint:

- The site boundary will be securely fenced off prior to construction activities to avoid potential for compaction of the existing soil as well as preventing any changes in the geological composition of the substrate (i.e. maintaining a calcareous substrate on which the grassland area is to be managed). There will be no construction access outside these fenced areas.
- Construction activity will follow best practice to avoid run off or any impacts of construction in the areas outside the site.
- Stripped topsoil from areas of calcareous grassland within the development footprint will be stored for use within the grassland management area of the development.

4.2 Grassland Management and Enhancement

The lands are not currently within a formal management regime and are therefore becoming encroached by scrub. Consequently, the current lack of management of the site is likely to result in the long-term deterioration in quality of the calcareous grassland and the further encroachment of scrub through succession. For this reason, the lands set aside for grassland management will be managed in accordance with the best practice management measures set out below. The management measures are based on guidance from “United Utilities, 2011, Sustainable Catchment Management Programme: Volume 6 *Restoration Of Upland Hay Meadows, Species-Rich Grasslands And Rush Pastures*”. Such measures are considered appropriate for the habitat recorded on site.

4.2.1 Semi-Natural Dry Calcareous and Neutral Grassland Management

In general, the objectives for management within the grassland areas are to increase botanical diversity (especially wildflowers), reduce the dominance of grasses in the sward and preventing scrub establishment. A number of case studies have been reviewed in order to determine the best management approach. However, grassland creation and management will vary from site to site and thus require site specific

management measures. In addition, each management plan may require alteration as the project progresses depending on revegetation success, species composition or the presence of undesirable species (overabundance of *Rumex* or *Cirsium* spp).

The main targets are to:

- Maintain low soil Phosphate index and appropriate pH through retaining the existing substrate and soil within the site,
- Achieve increases in abundance of calcareous grassland indicator species,
- Achieve cover of wildflowers between 20% and 90%, with 50-60% flowering in May-August,
- Keep bare ground to between 1% and 5%,
- Keep undesired species cover below 5% (United Utilities, 2011).

Although these targets have been based on case studies of similar projects, the ongoing monitoring programme for the site, post-construction, will need to adapt to the site specific geological, hydrological and climatic factors.

4.2.1.1 Mowing regime

In order to achieve the above targets, the following measures will be incorporated into the management of the grassland:

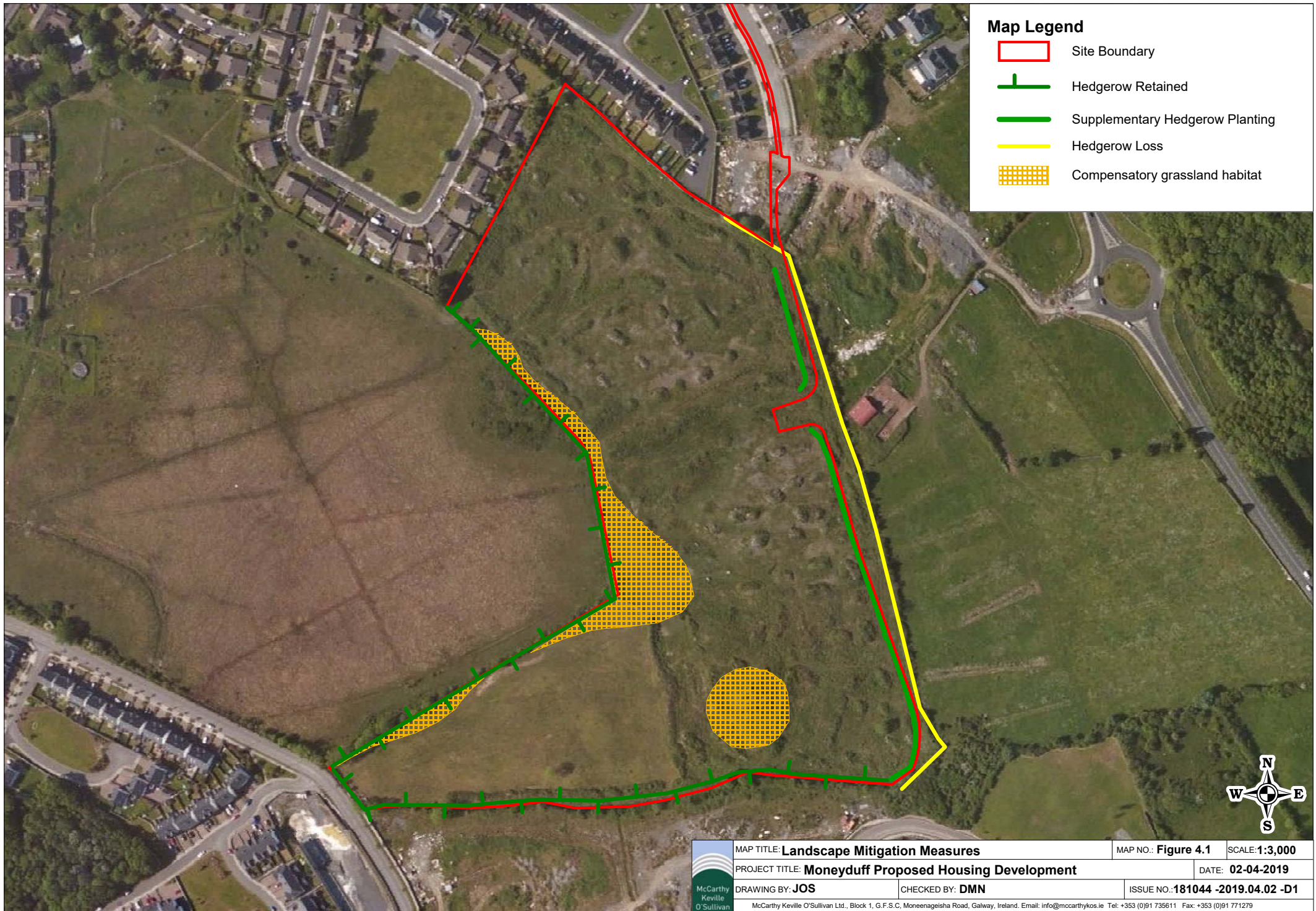
- Cutting will not take place before characteristic annual, biennial or short-lived perennial plant species which depend on seed production have set seed (for example yellow rattle (*Rhinanthus minor*). Sustained early grass cutting is known to reduce species richness in such grasslands (Smith 1994). For this reason, mowing will be undertaken in August of each year. This will also maintain the nature conservation value of the grassland.
- Ensure an occasional late mowing (late August/September) (e.g. 1 year in 5), where practical. This will promote late-flowering species such as devil's bit scabious (*Succisa pratensis*) (Crofts, and Jefferson, (eds), 2009).
- Discourage mowing machinery access to grassland when ground conditions are wet, otherwise rutting will occur which will damage the sward and create areas which could be invaded by undesirable species.
- Grass cut each year will always be removed and not left to decay on site. Where vegetation is left on site, changes in the botanical composition of the grassland may ensue. Excess vegetation left on site may also suppress low growing species and reduce species-richness. The removal of vegetation off the grassland will also help to impoverish the soil/ reduce nutrients and thereby suppress competitive grass species and enhance floral diversity. (Crofts, and Jefferson, (eds), 2009).
- There will be no use of herbicides or artificial fertilisers during the management of the grassland.

4.2.2 Facilitating Community Access to the Grassland

In order to maintain a managed appearance of the site for the local community, a narrow strip, approximately 1 metre wide, will be mown along each side of the public footpaths bordering the grassland (see Plate 4.1). In addition, a single mown path can be mown through the grassland to facilitate easy public access through the meadow, thereby allowing amenity access/participation and ensuring public buy-in. In addition, this will avoid tramping of the grassland and ensure localised access through the feature.



Plate 4.1 Mown path through grassland to facilitate local community access and avoid tramping
(Source: Albert Bridge, (2019).



INDICATIVE PLANTING SCHEDULES / SPECIES LISTS

PARKLAND TREE PLANTING		
Species	Specification	
(Ah) Aesculus hippocastanum	18-20cm girth / clearstem / rootball or airpot	
(Cd) Cedrus deodara	1-2m high / rootball or airpot	
(Cd) Cedrus libani	1-2m high / rootball or airpot	
(Fs) Fagus sylvatica	18-20cm girth / clearstem / rootball or airpot	
(Qp) Quercus petraea	18-20cm girth / clearstem / rootball or airpot	

STREET TREE PLANTING		
Species	Specification	
(Bp) Betula pendula	8-10cm girth / clearstem / rootball or airpot	
(Pc) Pyrus calleryana 'Chanticleer'	8-10cm girth / clearstem / rootball or airpot	
(Sa) Sorbus aria	8-10cm girth / clearstem / rootball or airpot	
(Sa) Sorbus aucuparia	8-10cm girth / clearstem / rootball or airpot	
(Tl) Tilia cordata 'Greenspire'	8-10cm girth / clearstem / rootball or airpot	

CLIPPED HEDGING		
Species	Specification	Quantity
Fagus sylvatica	1+2 bareroot transplants / 60-90cm	6 per lin.m
Carpinus betulus	1+2 bareroot transplants / 60-90cm	6 per lin.m

LOW HEIGHT SHRUB MIX - indicative schedule;		
Species	Spec	Density
Cotoneaster decorus	2l pot	3/sqm
Crocosmia lucifer	2l pot	3/sqm
Hypericum androsaemum	2l pot	3/sqm
Lavandula angustifolia	2l pot	3/sqm
Prunus laurocerasus 'Zabeliana'	2l pot	2/sqm
Rosa 'Flower Carpet' (White)	2l pot	3/sqm
Stipa tenuissima 'Irony Tails'	2l pot	4/sqm
Viburnum davidii	2l pot	3/sqm

NATIVE WOODLAND TREE & UNDERSTORY PLANTING		
Species	Specification	
(Ag) Alnus glutinosa	10-12cm girth / clearstem / rootball or airpot	
(Bp) Betula pubescens	10-12cm girth / clearstem / rootball or airpot	
(Ps) Pinus sylvestris	1m high rootball / airpot	
(Qp) Quercus petraea	10-12cm girth / clearstem / rootball or airpot	
(Ul) Ulmus lobel	10-12cm girth / clearstem / rootballed or airpot	
Corylus avellana	1+ 2 br transplant / 60-90cm	
Ilex aquifolium	3l pots / 20-30cm	

NATIVE HEDGEROW SUPPLEMENTAL PLANTING		
Species	Specification	
Crataegus monogyna	1+ 2 br transplant / 60-90cm	
Euonymus europaeus	1+ 2 br transplant / 60-90cm	
Prunus spinosa	1+ 2 br transplant / 60-90cm	
Quercus petraea	6-8cm girth / feathered / bare-root	
Sambucus nigra	1+ 2 br transplant / 60-90cm	
Rosa canina	1+ 2 br transplant / 60-90cm	
Viburnum opulus	1+ 2 br transplant / 60-90cm	



Raised pedestrian crossing points

Note:All street trees semi mature clearstem with minimum canopy height of 2m maintaining sightlines.

Existing boundary vegetation and drystone walling to be retained where present and supplemented with native hedgerow species where gaps occur.(refer to schedule).



Proposed area of open grassland adjoining SAC to be allowed to naturally regenerate & where appropriate supplemental native wildflower & grass seeding may occur. (Dashed line indicates mown pedestrian pathways with cellular grass reinforcement system).



0.9m wide mown margin where calcareous grassland adjoins tarmac path

Pumping station with 1.5m high stone clad wall with hedging around outside perimeter

Existing standing drystone wall to be retained.

Proposed area of open grassland adjoining SAC to be left to naturally regenerate.

Public parkland open space for passive recreation with specimen parkland and native tree planting

Homezone shared surface area incorporating communal garden

LEGEND

- Specimen Parkland Trees
- Large Species Street Trees
- Small Species Street Trees
- Medium Street Tree in grille / planter
- Native Woodland & Parkland Trees
- Native Woodland Understory Trees & Shrubs
- Existing boundary vegetation retained (locations indicative).
- Low Height ornamental shrub mix
- Medium height ornamental shrub mix
- 1.2m high clipped formal hedging
- Grass Lawn (Public Open Space)
- Private Garden Space
- Proposed Compensatory Calcareous Grassland
- Pedestrian Priority Homezone / Shared Surface Permeable Paving Setts
- Footpaths & Layby Permeable Paving Setts
- Brushed Concrete or Tarmac Footpaths
- Timber edged gravel footpath
- Brushed Concrete or Tarmac Parking Bays
- Cycle Racks
- Bollards
- Line of R&A zoning
- Site Boundary

Public parkland open space for passive recreation with specimen parkland and native tree planting

Hierarchy of street tree planting (small)

Hierarchy of street tree planting (large)

Hierarchy of street tree planting (medium)

Archaeological protection zone around ruins - voids to be infilled with topsoil to make safe loose rocks with upper surfaces left exposed before seeding with wildflower meadow grass and minimally invasive timber edge gravel pathways installed.

Native woodland canopy & understory planting

Native woodland canopy & understory planting

Homezone Detail 1:250



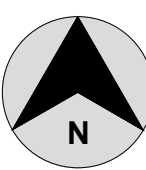
Playground Detail 1:250



C	22.02.19	CALCAREOUS GRASSLAND
B	18.12.18	CRECHE
A	14.06.18	LAYOUT
REV	DATE	AMENDMENT

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

LANDWAY OFFICE
ARDAONG, BALLYTRASNA, TUAM, CO GALWAY
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EMAIL: galwayinfo@csrlandplan.ie



PROJECT:
MONEYDUFF
ORANMORE
CO. GALWAY

DRAWING:
LANDSCAPE MASTER PLAN
(PLANNING DRAWING ONLY)

DATE:	FEBRUARY 2018
SCALE:	1:500 @ A0
DRAWN:	KM
CHECKED:	KM
DRAWING NO:	18223-3-100

4.2.3 Schedule of Actions

The following table sets out all the actions that will be undertaken in order to ensure that the appropriate grassland management is undertaken as described above. It sets out the objectives of all the actions and also gives a description of the timeline for the actions to be undertaken. The table also assigns responsibility for ensuring that each action is undertaken.

Table 4.1. - Schedule of Objectives and Actions for Semi-Natural Dry Calcareous and Neutral Grassland Management

No.	Objective	Target	Action	Timeline	Responsibility
Construction Phase					
01	Fence off areas identified for grassland management	<ul style="list-style-type: none"> Avoid significant alterations to the existing substrate composition. Do not allow storage of construction materials or vehicles within this area to avoid compaction. 	<ul style="list-style-type: none"> Site supervision by an appropriately qualified Ecological Clerk of Works (EcOW). 	Construction phase	Moneyduff development company
02	Scrub clearance	<ul style="list-style-type: none"> As the lands within the HMP grassland areas are currently dominated by scrub (predominantly blackthorn, bramble and bracken), this scrub material should be removed during initial site clearance to allow for simple regrading and grassland establishment. 	<ul style="list-style-type: none"> Scrub removal during initial site clearance. Scrub clearance will be undertaken outside the bird nesting season (1st March – 31st August). 	Construction phase	Moneyduff development company
03	Reuse of topsoil on site.	<ul style="list-style-type: none"> Strip topsoil from areas of existing semi-natural calcareous grassland and storage for reuse on site within areas subject to the Habitat Management Plan. The reuse of topsoil from within the site will allow the natural seedbank to establish a semi-natural grassland using seeds of local genetic origin. As the existing soil profile on site is thin and free draining, the lands within 	<ul style="list-style-type: none"> The stripping of topsoil should be supervised by an appropriately qualified Ecological Clerk of Works (EcOW) to ensure only the best source material is used. Minor regrading within HMP area (to allow for future mowing of the semi-natural grassland within the HMP area). 	Construction phase	Moneyduff development company

		the HMP areas will also match this characterisation.			
Operational Phase – Post Construction					
01	To establish semi-natural dry calcareous and neutral grassland	<ul style="list-style-type: none"> Monitor and manage revegetation success, species composition or the presence of undesirable species (overabundance of <i>Rumex</i> or <i>Cirsium</i> spp). 	<ul style="list-style-type: none"> Establish fixed point relevés (GPS tracked) for monitoring over subsequent years; examining extent of grassland, sward composition and structure. Make suggestions for alterations to management if/where required. 	Post-construction: Year 1	MKO Moneyduff development company
02	To maintain semi-natural dry calcareous and neutral grassland.	<ul style="list-style-type: none"> Manage grassland through annual mowing and grass removal. 	<ul style="list-style-type: none"> No fertilizers or herbicides will be applied in the Biodiversity Enhancement Area. The grassland will be seasonally mown post flowering of orchids (late summer - autumn). Grass cut each year will be removed and not left to decay on site. 	Annually	Moneyduff development company
03	To monitor the effectiveness of habitat enhancement & management measures.	<ul style="list-style-type: none"> Monitor grassland rehabilitation through fixed quadrats 	<ul style="list-style-type: none"> Establish fixed point relevés (GPS tracked) & monitor over subsequent years; examining extent of grassland & sward composition. Evaluate the effectiveness of the habitat enhancement measures, 	Years 1,2,3,5 & 10	Moneyduff development company MKO

MKO: McCarthy Keville O'Sullivan

4.3 Hedgerow Enhancement and Retention of Stone Walls

4.3.1 Hedgerow enhancement

The hedge along the eastern boundary that will be lost to facilitate the change in ground levels associated with the proposed development at this location will be mitigated by replacing it with a new hedge that will mark the eastern boundary of the development throughout the operation of the scheme.

Additional planting will be undertaken to enhance existing hedgerows and thus increase ecological connectivity as well as providing additional screening for the proposal. Planting will use native species found in the wider area. Tables 4.2 to 4.4 provide a summary of the species to be used on site for planting as described in the Landscape Management Plan. The planting of predominantly native species will benefit local wildlife by providing additional feeding and breeding habitat. Species such as burnet rose, oak, hawthorn or guelder rose will provide winter berries/ fruit that will support a wide variety of wintering birds and small mammals.

The areas of hedge to be lost and replanted are shown in Figure 4.1 along with those areas to be retained and replaced.

Table 4.1 Recommended Tree Planting Species

Common name	Scientific name	Size
<i>Betula pendula</i>	Birch	8-10cm
<i>Tilia cordata</i>	Lime	8-10cm
<i>Quercus petraea</i>	Sessile oak	18-20cm
<i>Sorbus aria</i>	Whitebeam	8-10cm
<i>Sorbus aucuparia</i>	Rowan	8-10cm

Table 4.2 Naturalised Hedge Planting

Scientific name	Common name	Size
<i>Crataegus monogyna</i>	Hawthorn	60-90cm
<i>Euonymus europaeus</i>	Spindle	60-90cm
<i>Prunus padus</i>	Bird cherry	60-90cm
<i>Prunus Spinosa</i>	Blackthorn	60-90cm
<i>Quercus petraea</i>	Sessile oak	6-8cm girth
<i>Sambucus nigra</i>	Elder	60-90cm
<i>Rosa canina</i>	Dog rose	60-90cm
<i>Viburnum opulus</i>	Guelder rose	60-90cm
<i>Crataegus monogyna</i>	Hawthorn	60-90cm

Table 4.3 Shrub & Herbaceous Planting within the development

Scientific name	Common name	Size
<i>Alnus glutinosa</i>	Alder	10-12cm
<i>Betula pebescens</i>	Downy birch	10-12cm
<i>Pinus sylvestris</i>	Scot's pine	1m high rootball
<i>Quercus petraea</i>	Sessile oak	10-12cm girth
<i>Ulmus 'Lobel'</i>	Elm	10-12cm girth
<i>Corylus avellana</i>	Hazel	60-90cm
<i>Ilex aquifolium</i>	Holly	20-30cm

New planting will be checked annually for damage and dead branches will be removed and weeds cleared. No cutting of hedgerows for maintenance within the land management area will occur during the bird breeding season 1st March – 31st August in any year, to prevent impacts on nesting bird species. All wild birds, their eggs, young and nests are protected under the Wildlife Act 1976-2017.

4.3.2 Stone Wall Retention

Stone walls along the entire western boundary of the site will be retained as part of the overall plan. This is shown clearly within the Landscaping Plan for the site (see Figure [see Figure 18223 – 3 - 100]).

4.3.3 Consideration of Policies and Objectives of local development and conservation plans

The measures included in Sections 4.3.1 and 4.3.2 will maintain compliance with the following Policies and Objectives of local area plans:

Galway County Development Plan 2010-2016:

Objective NHB 2 – Biodiversity and Ecological Networks

Galway BAP 2014 - 2020

Policy No 13 - promote the retention of hedgerows, recognising their importance as wildlife corridors. Promote the retention of dry-stone walls.

4.4 Public Information Signage

The project has been designed to maintain/ facilitate public access to the grassland. As public access will be facilitated through the proposed grassland management area by mown paths, this will aim to minimise tramping of vegetation. The erection of educational signage, to inform the local community of the biodiversity management practices being implemented on site, would be of particular benefit for community engagement. Such signage will consider the following topics:

- The biodiversity benefits of grassland management, including maintaining floral diversity, pollinator benefits etc,
- Provide a list of plant species known to occur in the area such as yellow rattle (*Rhinanthus minor*), as well as some interesting facts for each species,
- Additional information about other mammal species to be found in the wider area, including birds, bats and terrestrial mammals.

Plate 4.2 provides an example of suitable public information signage.



Plate 4.2. Example of information signage to be erected on site

4.5 Faunal habitat enhancement measures

In order to enhance the habitat within the land ownership boundary for wildlife, the following general wildlife enhancement measures are proposed:

Bat boxes

Ten new bat boxes will be provided along the tree line habitat. This will provide greater potential for the establishment of roosting bats in the area. Bat boxes will be similar to the general purpose Schwegler 2F type and placed at a minimum height of 3m on mature trees with a variety of different aspects. This will increase the likelihood of bat boxes being used at different times of the year. An appropriately qualified ecologist should advise on the locations at which bat boxes should be erected. An example of a suitable Schwegler 2F type bat box is provided in Plate 4.3.



Plate 4.3 Example of Schwegler 2F type bat box suitable for roosting bat species within woodland habitat

Bird boxes

Bird boxes will be erected within the treeline habitat to facilitate common and widespread species such as blue tit and robin.. An appropriately qualified ecologist should advise on the locations at which bird boxes should be erected. Examples of suitable bird boxes are shown here in plate 4.4.



Plate 4.4. blue tit nest box design

5 CONCLUSION

The implementation of the grassland management regime will ensure the long-term viability of the semi-natural calcareous grassland habitat within the landownership boundary. The supplementary planting within existing hedgerows along the west and south of the site and the replacement of the eastern hedge community ensure that connectivity of linear landscape features will be retained and enhanced. Bird and bat boxes will provide additional nesting/roosting habitat on the site. Information signage will help to provide a better understanding of the floral diversity in the area and management practices required to maintain the habitat in its optimal quality.

There is a commitment to the implementation of the measures that are set out in this plan including both the establishment and maintenance of the grasslands. A commitment is also made to monitor the development of the grasslands on an ongoing basis following construction. These measures are an integral part of the planning permission and as such, confer protection on the habitat where currently none exists. The habitat is currently deteriorating in both area and quality due to lack of management. The plan also commits to the planting, management and monitoring of all hedgerow planting and the erection of bird and bat boxes.

6 REFERENCES

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Appendix 5-1

Habitats Assessment of Fen

Annex I Habitat Assessment of Fen

**Proposed Housing Development
Moneyduff, Oranmore,
Co. Galway**



Planning & Environmental Consultants

DOCUMENT DETAILS

Client: Arlum Ltd

Project title: Proposed Housing development
Moneyduff, Oranmore
Co. Galway

Project Number: 181044

Document Title: Annex I Habitat Assessment of Fen

Doc. File Name: 181044 - Annex I Habitats Assessment –
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Table of Contents

1	Introduction.....	1
1.2	Best Practice and Guidance	1
2	Survey Methodology	2
3	Results	4
3.1	Rich Fen and Flush.....	4
3.1.1	Relevé Survey	4
3.1.2	Site Conservation Status (Foss & Crushell (2008))	9
4	Discussion and Conclusions	9
5	References	11

1 INTRODUCTION

1.1 General Introduction

This report has been completed to inform an impact assessment of a Proposed Housing development at Moneyduff, Oranmore, Co. Galway. The report will provide an assessment of habitat adjacent to the proposed development, within the Galway Bat Complex SAC, which was identified as rich fen and flush. The assessment will evaluate whether the fen habitats conforms to habitats listed under Annex I of Directive 92/43/EEC (Habitats Directive) at Moneyduff, Oranmore, Co. Galway.

The habitat assessment is based on field visits by a suitably qualified ecologist James Owens (B.Sc. (Env.), M.Sc.). The surveyor has extensive experience in vegetation classification and survey techniques and has conducted detailed habitat assessment for a number of developments.

1.2 Best Practice and Guidance

The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines and resources:

- Foss, P.J. & Crushell, P. 2008. Guidelines for a National Fen Survey of Ireland. Report submitted to National Parks & Wildlife Service, Dublin.
- European Commission (2008) Management of Natura 2000 habitats *Alkaline fens* 7230. Directive 92/42/EEC on the conservation of natural habitats and wild fauna and flora. Technical Report 2008 20/24.
- European Commission (2013) *Interpretation Manual of European Union Habitats – EU27*.
- Review of online web-mappers: Geological Survey of Ireland (GSI)
- NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
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- Perrin, P.M., J.R., Barron, Roche, J.R. and O'Hanrahan, B. (2014) Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Report submitted to National Parks & Wildlife Service, Dublin.
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- Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

2 SURVEY METHODOLOGY

2.1 Annex I Surveys

A detailed assessment of the fen habitat was conducted by McCarthy Keville O'Sullivan following site visits undertaken on the 13/12/2018 and 09/04/2019. The survey followed the methodology and assessment criteria outlined in Foss & Crushell (2008) (Fen). Habitats were identified in accordance with the Heritage Council's *'Guide to Habitats in Ireland'* (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in *'Best Practice Guidance for Habitat Survey and Mapping'* (Smith *et al.*, 2011). Grassland habitat identified during the fen survey was assessed following methodologies outlined in O'Neil *et al.* (2013) and Martin *et al.* (2018). Plant nomenclature for vascular plants follows New Flora of the British Isles (Stace, 2010), whilst mosses and liverworts follows Mosses and Liverworts of Britain and Ireland - a field guide (British Bryological Society, 2010). The results of the survey are shown in Figure 2.1.

2.1.1 Rich Fen and Flush

Survey methods follow methodology developed by Foss & Crushell (2008). A relevé measuring 2m x 2m was devised at each sampling location to estimate cover abundance of plant species present within each relevé. Three stops/relevés were recorded at the site.

2.1.1.1 Conservation Status (Foss & Crushell, 2008)

The survey methods outlined by Foss & Crushell (2008) for determining the conservation value of sites have been applied to the fen assessment undertaken at Moneyduff. The methods employ a ranking scheme and a conservation value score system to determine conservation value for each site. Conservation scores are assessed (scores ranked 0 to 5 for each category) under the following categories: Naturalness, Non-recreatability, Potential Value, Typicality, Education Value, Size, Diversity, Fen Value, Rarity of Species, Rarity of Habitats, Viability, Recorded History, Management Needs, Intrinsic Appeal and Expert Opinion. An example of the conservation value score system is presented in Table 2.2. Site rating is based on the ecological and site evaluation criteria presented in Table 2.3. This is a modified version of the ecological evaluation criteria developed by the NRA (NRA, 2009). Positive indicator species lists were also derived from NPWS Article 17 Report (2013) and Perrin *et al.* (2014).

Table 2.1: The Conservation value score system and ranking scheme applied to sites by Foss & Crushell (2008).

Site Conservation Status	Score Value	Ranking Code
International value	40 - 75	A
National value	30 - 75	B
County Value	25 - 29	C+
High local value	20 - 24	C
Moderate local value	11 - 19	D
Low local value	0 - 10	E

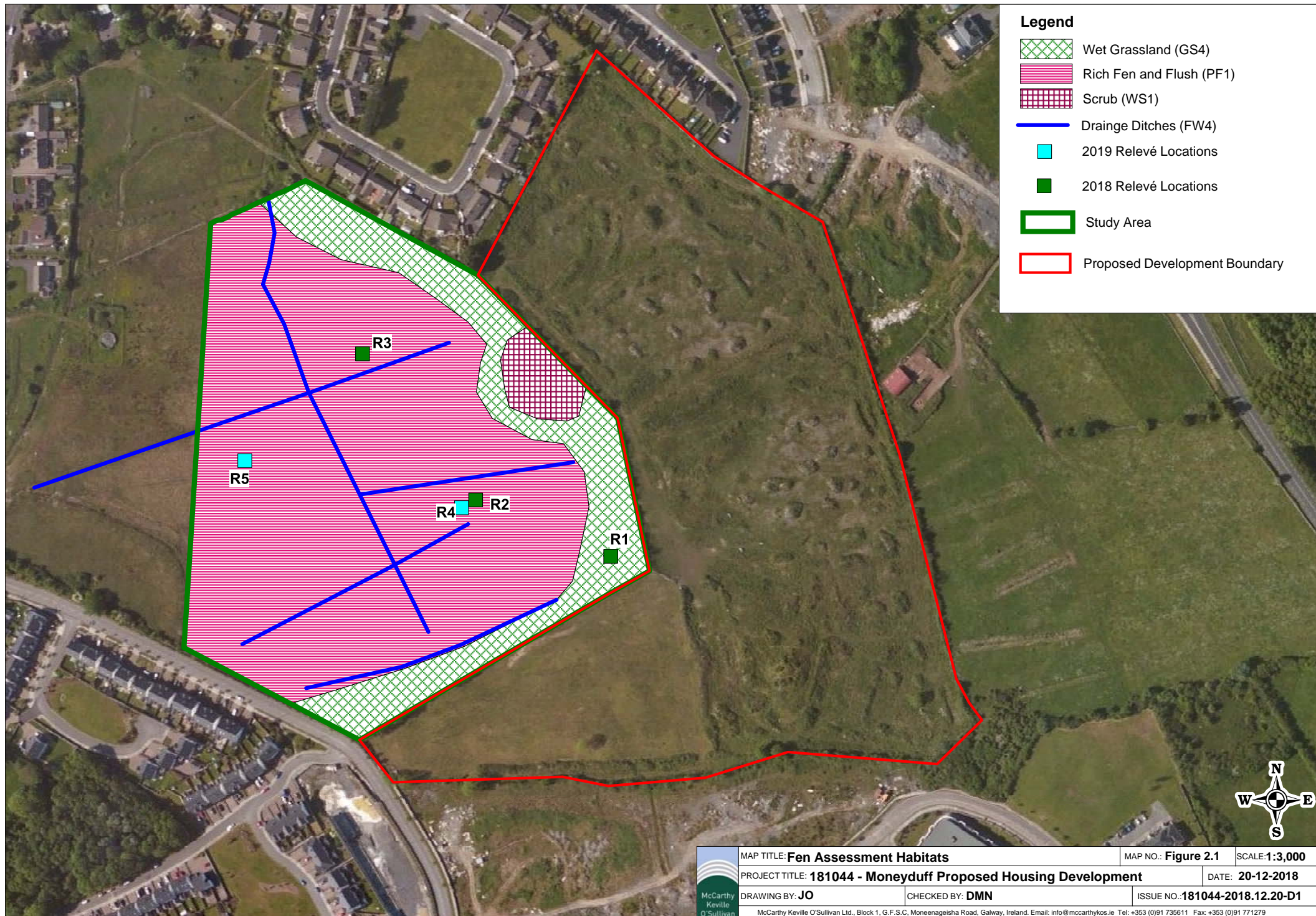


Table 2.2: Site ranking criteria used by Foss & Crushell (2008) (National Fen Survey of Ireland).

Ranking	Ecological Valuation: Examples
A	International Important <ul style="list-style-type: none"> - Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives. - Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive. - Major salmon river fisheries. - Major salmonid (salmon, trout or char) lake fisheries.
B	National Important <ul style="list-style-type: none"> - Sites or waters designated or proposed as an NHA* or statutory Nature Reserves. - Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive). - Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000. - Major trout river fisheries. - Water bodies with major amenity fishery value. - Commercially important coarse fisheries.
C+	County Value <ul style="list-style-type: none"> - Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or significant populations of species which are rare in the county. - Small water bodies with known salmonid populations or with good potential salmonid habitat. - Sites containing resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive. - Large water bodies with some coarse fisheries value.
C	High Value, local important <ul style="list-style-type: none"> - Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species. - Small water bodies with known salmonid populations or with good potential salmonid habitat. - Sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive. - Large water bodies with some coarse fisheries value.
D	Moderate value, locally important <ul style="list-style-type: none"> - Sites containing some semi-natural habitat or locally important for wildlife. - Small water bodies with some coarse fisheries value or some potential salmonid habitat. - Any water body with unpolluted water (Q-value rating 4-5).
E	Low value, locally important <ul style="list-style-type: none"> - Sites containing some remnant semi-natural habitat or locally important for wildlife, but where disturbance has significantly altered habitat and/or continues to threaten future survival of the site.

3 RESULTS

3.1 Rich Fen and Flush

The study area was visited on the 14th of December 2018 and on the 9th of April 2019. The survey followed the methodology and assessment criteria outlined by Foss & Crushell (2008) for determining the conservation value of fens. The habitats identified within the study area included Rich fen and flush (PF1), Wet grassland (GS4) and blackthorn Scrub (WS1) and are shown in Figure 3.1. The fen (PF1) was found to conform to the Annex I Habitat Alkaline fens [7230] and graded into Wet grassland (GS4) along its east and south-east edges, which conformed to the Annex I habitat *Molinia* meadows [6410].

3.1.1 Relevé Survey

Table 3.1 Species Recorded from Relevé 01

Scientific Name	Common name	Percentage Cover/Abundance
<i>Filipendula ulmaria</i>	Meadowsweet	2
<i>Succisa pratensis</i>	Devil's-bit scabious	2
<i>Trifolium pratense</i>	Red clover	1
<i>Plantago lanceolata</i>	Ribwort plantain	5
<i>Festuca rubra</i>	Red fescue	5
<i>Centaurea nigra</i>	Knapweed	1
<i>Taraxacum officinale</i> agg.	Dandelion	+
<i>Juncus inflexus</i>	Hard rush	1
<i>Carex flacca</i>	Glaucous sedge	5
<i>Holcus lanatus</i>	Yorkshire fog	10
<i>Potentilla erecta</i>	Tormentil	+
<i>Carex panicea</i>	Carnation sedge	10
<i>Lotus corniculatus</i>	Bird's-foot trefoil	+
<i>Carex viridula</i>	Green sedge	10
<i>Cirsium palustre</i>	Marsh thistle	+
<i>Lythrum salicaria</i>	Purple loosestrife	+
<i>Agrostis capilaris</i>	Common bent	10
<i>Juncus articulatus</i>	Jointed rush	+
<i>Calliergonella cuspidatum</i>		5
Grid reference	E138188 N223583	

Table 3.2 Species Recorded from Relevé 02

Scientific Name	Common name	Percentage Cover/Abundance
<i>Carex panicea</i>	Carnation sedge	2
<i>Carex flacca</i>	Glaucous sedge	+
<i>Potentilla erecta</i>	Tormentil	+
<i>Hypericum pulchrum</i>	Slender St-John's wort	+
<i>Erica tetralix</i>	Cross-leaved heath	+
<i>Molinia caerulea</i>	Purple moor-grass	75
<i>Juncus articulatus</i>	Jointed rush	1
<i>Succisa pratensis</i>	Devil's-bit scabious	+
<i>Schoenus nigricans</i>	Black bog-rush	25
<i>Calliergonella cuspidatum</i>		3

Scientific Name	Common name	Percentage Cover/Abundance
<i>Fissidens adianthoides</i>		+
<i>Campylium stellatum</i>		2
<i>Palustriella commutata</i>		2
Grid reference	E138102 N223619	

Table 3.3 Species Recorded from Relevé 03

Scientific Name	Common name	Percentage Cover/Abundance
<i>Carex panicea</i>	Carnation sedge	1
<i>Carex flacca</i>	Glaucous sedge	+
<i>Dactylorhiza sp.</i>	Orchid	+
<i>Carex viridula</i>	Green sedge	5
<i>Carex pulicaris</i>	Flea sedge	+
<i>Molinia caerulea</i>	Purple moor-grass	65
<i>Schoenus nigricans</i>	Black bog-rush	15
<i>Juncus articulatus</i>	Jointed rush	+
<i>Succisa pratensis</i>	Devil's-bit scabious	+
<i>Erica tetralix</i>	Cross-leaved heath	2
<i>Juncus conglomeratus</i>	Compact rush	+
<i>Potentilla erecta</i>	Tormentil	+
<i>Lolium perenne</i>	Perennial ryegrass	1
<i>Lythrum salicaria</i>	Purple loosestrife	+
<i>Calliergonella cuspidatum</i>		5
<i>Hylocomium splendens</i>		5
<i>Pseudoscleropodium purum</i>		10
<i>Aulacomnium palustre</i>		1
<i>Campylium stellatum</i>		+
Grid reference	E138030 N223712	

Table 3.4 Species Recorded from Relevé 04

Scientific Name	Common name	Percentage Cover/Abundance
<i>Carex panicea</i>	Carnation sedge	1
<i>Carex viridula</i>	Green sedge	10
<i>Phragmites australis</i>	Common reed	+
<i>Erica tetralix</i>	Cross-leaved heath	+
<i>Molinia caerulea</i>	Purple moor-grass	70
<i>Juncus effusus</i>	Soft rush	2
<i>Succisa pratensis</i>	Devil's-bit scabious	1
<i>Schoenus nigricans</i>	Black bog-rush	15
<i>Calliergonella cuspidatum</i>		1
<i>Scorpidium scorpioides</i>		2
<i>Campylium stellatum</i>		3
<i>Pseudoscleropodium purum</i>		5
<i>Palustriella commutata</i>		2
Grid reference	E 138093 N 223614	

Table 3.5 Species Recorded from Relevé 05

Scientific Name	Common name	Percentage Cover/Abundance
<i>Carex panicea</i>	Carnation sedge	+

Scientific Name	Common name	Percentage Cover/Abundance
<i>Festuca rubra</i>	Red fescue	5
<i>Eriophorum sp.</i>	Cotton-grass	1
<i>Carex viridula</i>	Green sedge	5
<i>Molinia caerulea</i>	Purple moor-grass	80
<i>Schoenus nigricans</i>	Black bog-rush	15
<i>Succisa pratensis</i>	Devil's-bit scabious	+
<i>Erica tetralix</i>	Cross-leaved heath	1
<i>Potentilla erecta</i>	Tormentil	+
<i>Calliergonella cuspidatum</i>		1
<i>Pseudoscleropodium purum</i>		3
<i>Palustriella commutata</i>		3
<i>Scorpidium scorpioides</i>		1
<i>Fissidens adianthoides</i>		+
<i>Campylium stellatum</i>		3
Grid reference	E 137955 N 223644	

Relevé 1 was taken within a fringe of heavily grazed wet grassland which buffers the entire fen from the proposed development site (Plate 3.1). This area is transitional between the fen and drier grassland within the proposed development site. The area of wet grassland corresponds to the Annex I grassland habitat *Molinia* meadows on calcareous, peaty or clayey-silt laden soils (*Molinion caeruleae*) [6410]. Although this habitat is not a Qualifying Interest for the Galway Bay Complex SAC, it is known to form mosaics with fen and flush habitats at other sites such as Lough Corrib SAC. Seven positive indicator species were recorded for 6410 habitat within the relevé as per Martin et al. (2018). Although no the high quality indicator species were recorded within the relevé, meadow thistle (*Cirsium dissectum*), was recorded within the surrounding area.



Plate 3.1 Relevé1 Wet grassland (GS4)

Relevés 2 and 4 were broadly representative of most of the fen within the centre and south of the study area (Plate 3.2 and Plate 3.3). Vegetation height was relatively high, between 40-50cm, and was dominated by tussocks of purple moor-grass (*Molinia caerulea*) and to a lesser extent black bog-rush (*Schoenus nigricans*). Bryophyte cover was relatively low (10-12%) with

the following brown moss indicator species for alkaline fen recorded; *Fissidens adianthoides*, *Campylium stellatum*, *Scorpidium scorpioides* and *Palustriella commutata*. Other species recorded in the surrounding area but not considered indicator species in Article 17 reporting included bog asphodel (*Narthecium ossifragum*) and bog myrtle (*Myrica gale*). Ground conditions were soft underfoot but not quaking with some standing surface water and the area. Past grazing by livestock was also evident. Hydrological conditions were deemed favourable to support Rich fen and flush habitat (PF1). The fen habitat conforms to Annex I Alkaline fens [7230] habitat.



Plate 3.2 Relevé 2 Rich fen and flush (PF1)



Plate 3.3 Relevé 4 Rich fen and flush (PF1)

Relevé 3 was broadly representative of degraded parts of the fen associated with drains, particularly the northern part of the study area (Plate 3.4). This area had been grazed and Vegetation height was relatively short, approximately 15-20cm, and was dominated by small tussocks of purple moor-grass (*Molinia caerulea*) and to a lesser extent black bog-rush

(*Schoenus nigricans*) and sedges (*Carex panicea*, *Carex viridula*). Bryophyte cover was approximately 20% and dominated by *Pseudoscleropodium purum*, *Calliergonella cuspidatum* and *Hylocomium splendens*. The only positive brown moss indicator species recorded for Alkaline fen was *Campylium stellatum*. Ground conditions were mainly solid underfoot with only a small area of standing water. Two large drains dissect the surrounding area which has led to drying out of part of the fen and hydrological conditions were deemed unfavourable to support Rich fen and flush habitat (PF1). Although degraded, this area still corresponds to the Annex I Alkaline fens [7230] habitat due to the presence of a number of indicator species including black bog-rush, green sedge, flea sedge (*Carex pulicaris*), devil's-bit scabious (*Succisa pratensis*), orchid (*Dactylorhiza* sp), *Calliergonella cuspidatum* and the brown moss *Campylium stellatum*.



Plate 3.4 Relevé 3 Rich fen and flush (PF1)

Relevé 5 was also located in an area degraded fen associated with drains, within the western part of the study area (Plate 3.5). The area had been grazed but vegetation height was taller than Relevé 3 at approximately 30-40cm and was dominated by tussocks of purple moor-grass (*Molinia caerulea*) and to a lesser extent black bog-rush (*Schoenus nigricans*). Bryophyte cover was approximately 10% and dominated by *Pseudoscleropodium purum*, *Campylium stellatum* and *Palustriella commutata*. The positive brown moss indicator species *Scorpidium scorpioides* for Alkaline fen was also recorded. Ground conditions were relatively solid underfoot with some standing water and some drying out has occurred with a large drain located approximately 10m north of the relevé. Although some drying has occurred, hydrological conditions were still deemed favourable to support Rich fen and flush habitat (PF1). The fen habitat conforms to Annex I Alkaline fens [7230] habitat.



Plate 3.5 Relevé 5 Rich fen and flush (PF1)

3.1.2 Site Conservation Status (Foss & Crushell (2008))

Conservation value scores and ranking system to determine conservation value of the survey area have been assessed (scores ranked 0 to 5 for each category) in line with methods outlined in Section 2.1.2.1. The results of these are presented in Table 3.6.

Table 3.6 Conservation value scores and ranking scheme applied to Moneyduff, Co. Galway.

Site Conservation Status	Score Value	Ranking Code
Lislaughtera	40-75 (score of 51)	A

Applying the conservation value score system and ranking scheme used by Foss & Crushell (2008), the study area has a site conservation status that corresponds to category **A**:

International importance (refer to Table 2.3).

4 DISCUSSION AND CONCLUSIONS

The fen habitat conforms to the Annex I habitat Alkaline fens [7230]. The fen contains a number of drainage ditches, with two large drains in the northern half of the fen. The relevé taken in this northern area indicates that the fen has partially dried out with negative indicator species such as perennial ryegrass being recorded. There was also poor brown moss diversity in this area. More brown mosses were recorded in the southern part of the fen which was much wetter and in better ecological condition. Despite the degraded nature of part of the fen its concluded that the conservation status of the site is of *International Importance*. The fen graded into a strip of wet grassland which conformed to the Annex I habitat *Molinia* meadows [6410] along its eastern and south-eastern edges. This habitat is not a Qualifying Interest for the Galway Bay Complex SAC and an assessment of the quality of the Annex I habitat could not be undertaken given that it is outside the optimal survey season for grasslands. However, as the *Molinia*

meadow habitat is an integral part of the adjacent fen, the conservation status of the habitat is classified as *International Importance* on a precautionary basis.

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Appendix 5-2

Annex I Grassland Assessment

Appendix 5-2 Botanical Study Data

**Proposed Housing Development
Moneyduff, Oranmore,
Co. Galway**



Planning & Environmental Consultants

DOCUMENT DETAILS

Client: Arlum Ltd

Project title: Proposed Housing development
Moneyduff, Oranmore
Co. Galway

Project Number: 181044

Document Title: Botanical Study Data

Doc. File Name: 181044 - Botanical Study Data –
2019.04.02 – F

Prepared By: McCarthy Keville O’Sullivan Ltd.
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001	Final	02.04.2019	181044 - Botanical Study Data – 2019.04.02 – F	JO	PR

BOTANICAL STUDY – MONEYDUFF 2017

Relevé 01 Grid Ref 138410 223486

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	1
* <i>Daucus carota</i>	Wild carrot	5
<i>Senecio jacobea</i>	Common ragwort	2
<i>Centaurea nigra</i>	Common knapweed	10
<i>Euphrasia sp.</i>	Eyebright	5
* <i>Leontodon hispidus</i>	Rough hawkbit	10
<i>Fragaria vesca</i>	Wild strawberry	3
** <i>Dactylorhiza sp.</i>	Orchid	+
<i>Leucanthemum vulgare</i>	Ox-eye daisy	10
<i>Lathyrus pratensis</i>	Meadow vetchling	2
** <i>Anthyllis vulneraria</i>	Kidney vetch	15
<i>Hypericum sp.</i>	St. John's wort	3
* <i>Thymus polytrichus</i>	Wild thyme	+
<i>Bromus hordeaceus</i>	Soft brome	+
<i>Saxifraga sp.</i>	Saxifrage	+
<i>Corylus avellana</i>	Hazel	1
<i>Potentilla erecta</i>	Tormentil	+
<i>Prunella vulgaris</i>	Selfheal	+
<i>Plantago lanceolata</i>	Ribwort plantain	+
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	3
<i>Vicia sepium</i>	Bush vetch	1
<i>Holcus lanatus</i>	Yorkshire fog	1
<i>Tussilago farfara</i>	Coltsfoot	1
<i>Centaureum pulchellum</i>	Lesser centaury	+
* <i>Pilosella officinarum</i>	Mouse-ear hawkweed	+
<i>Festuca rubra</i>	Red fescue	+
<i>Taraxacum officinale</i> agg.	Dandelion	1
<i>Rubus fruticosus</i> agg.	Bramble	10
* <i>Carex flacca</i>	Glaucous sedge	15
<i>Trifolium pratense</i>	Red clover	5
* <i>Homalothecium lutescens</i>		7
Bare rock		10

*Denotes Positive indicator species of Annex I habitat [6210]

** Denotes high quality indicator species of Annex I habitat [6210]

Relevé 02 Grid Ref 138396 223513

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
* <i>Daucus carota</i>	Wild carrot	5
<i>Arrhenatherum elatius</i>	False oat-grass	5
<i>Senecio jacobea</i>	Common ragwort	3
<i>Centaurea nigra</i>	Common knapweed	10
<i>Euphrasia sp.</i>	Eyebright	2
* <i>Leontodon hispidus</i>	Rough hawkbit	5
<i>Carex panicea</i>	Carnation sedge	3
* <i>Lotus corniculatus</i>	Bird's-foot trefoil	10
<i>Dactylis glomerata</i>	Cock's-foot grass	2

Scientific Name	Common name	Percentage Cover
<i>Hypochaeris radicata</i>	Cat's ear	15
<i>Potentilla sterilis</i>	Barren strawberry	5
** <i>Linum catharticum</i>	Fairy flax	+
<i>Leucanthemum vulgare</i>	Ox-eye daisy	3
** <i>Anthyllis vulneraria</i>	Kidney vetch	5
<i>Hypericum sp.</i>	St. John's wort	1
<i>Filipendula ulmaria</i>	Meadowsweet	+
<i>*Helictotrichon pubescens</i>	Downy oat-grass	+
<i>Potentilla erecta</i>	Tormentil	+
<i>Prunella vulgaris</i>	Selfheal	5
<i>Plantago lanceolata</i>	Ribwort plantain	20
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	1
<i>Holcus lanatus</i>	Yorkshire fog	1
<i>Centaureum pulchellum</i>	Lesser centaury	+
<i>Rubus fruticosus agg.</i>	Bramble	7
<i>*Carex flacca</i>	Glaucous sedge	5
<i>Trifolium pratense</i>	Red clover	5
<i>Cynosurus cirsatus</i>	Crested dog's-tail	+
<i>Agrostis capillaris</i>	Common bent	1
<i>*Homalothecium lutescens</i>		2
Bare rock		2

**Denotes Positive indicator species of Annex I habitat [6210]*

*** Denotes high quality indicator species of Annex I habitat [6210]*

Relevé 03 Grid Ref 138355 223533

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
<i>Cirsium arvense</i>	Creeping thistle	+
<i>Senecio jacobea</i>	Common ragwort	1
<i>Centaurea nigra</i>	Common knapweed	25
<i>*Lotus corniculatus</i>	Bird's-foot trefoil	20
<i>Dactylis glomerata</i>	Cock's-foot grass	2
<i>Euphrasia sp.</i>	Eyebright	+
<i>*Leontodon hispidus</i>	Rough hawkbit	5
<i>Filipendula ulmaria</i>	Meadowsweet	5
<i>Ranunculus repens</i>	Creeping buttercup	5
** <i>Dactylorhiza sp.</i>	Orchid	1
** <i>Linum catharticum</i>	Fairy flax	1
<i>Bromus hordeaceus</i>	Soft brome	+
<i>Saxifraga sp.</i>	Saxifrage	+
<i>Hypochaeris radicata</i>	Cat's ear	10
<i>Potentilla erecta</i>	Tormentil	+
<i>Prunella vulgaris</i>	Selfheal	3
<i>Plantago lanceolata</i>	Ribwort plantain	3
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	10
<i>Holcus lanatus</i>	Yorkshire fog	5
<i>Rubus fruticosus agg.</i>	Bramble	15
<i>*Carex flacca</i>	Glaucous sedge	10
<i>Trifolium pratense</i>	Red clover	5
<i>*Homalothecium lutescens</i>		+

**Denotes Positive indicator species of Annex I habitat [6210]*

*** Denotes high quality indicator species of Annex I habitat [6210]*

Relevé 04 Grid Ref 138378 223504

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
* <i>Daucus carota</i>	Wild carrot	1
<i>Centaurea nigra</i>	Common knapweed	40
** <i>Briza media</i>	Quaking grass	+
<i>Euphrasia sp.</i>	Eyebright	1
* <i>Leontodon hispidus</i>	Rough hawkbit	5
<i>Leontodon autumnalis</i>	Autumn hawkbit	+
* <i>Lotus corniculatus</i>	Bird's-foot trefoil	3
<i>Filipendula ulmaria</i>	Meadowsweet	2
<i>Ranunculus repens</i>	Creeping buttercup	5
<i>Dactylis glomerata</i>	Cock's-foot grass	1
** <i>Linum catharticum</i>	Fairy flax	+
** <i>Anthyllis vulneraria</i>	Kidney vetch	1
<i>Potentilla erecta</i>	Tormentil	+
<i>Prunella vulgaris</i>	Selfheal	5
<i>Plantago lanceolata</i>	Ribwort plantain	15
<i>Holcus lanatus</i>	Yorkshire fog	5
<i>Rubus fruticosus agg.</i>	Bramble	15
* <i>Carex flacca</i>	Glaucous sedge	15
<i>Trifolium pratense</i>	Red clover	3
<i>Trifolium repens</i>	White clover	3
<i>Cynosurus cristatus</i>	Crested dog's-tail	1
<i>Vicia cracca</i>	Tufted vetch	1

*Denotes Positive indicator species of Annex I habitat [6210]

** Denotes high quality indicator species of Annex I habitat [6210]

Relevé 05 138302 223622

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
* <i>Daucus carota</i>	Wild carrot	55
<i>Leucanthemum vulgare</i>	Ox-eye daisy	1
<i>Lathyrus pratensis</i>	Meadow vetchling	+
<i>Campanula rotundifolia</i>	Harebell	2
** <i>Briza media</i>	Quaking grass	2
<i>Euphrasia sp.</i>	Eyebright	1
* <i>Leontodon hispidus</i>	Rough hawkbit	10
<i>Centaureum pulchellum</i>	Lesser centaury	+
<i>Dactylis glomerata</i>	Cock's-foot grass	2
** <i>Linum catharticum</i>	Fairy flax	+
** <i>Anthyllis vulneraria</i>	Kidney vetch	3
<i>Hypochaeris radicata</i>	Cat's ear	55
<i>Potentilla erecta</i>	Tormentil	1
<i>Plantago lanceolata</i>	Ribwort plantain	+
* <i>Carex flacca</i>	Glaucous sedge	15
<i>Trifolium pratense</i>	Red clover	1
<i>Succisa pratensis</i>	Devil's-bit scabious	+
<i>Cynosurus cristatus</i>	Crested dog's-tail	3

*Denotes Positive indicator species of Annex I habitat [6210]

** Denotes high quality indicator species of Annex I habitat [6210]

Relevé 06 Grid Ref 138213 223821

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
* <i>Daucus carota</i>	Wild carrot	1
<i>Centaurea nigra</i>	Common knapweed	20
** <i>Briza media</i>	Quaking grass	5
<i>Festuca rubra</i>	Red fescue	1
* <i>Leontodon hispidus</i>	Rough hawkbit	10
* <i>Lotus corniculatus</i>	Bird's-foot trefoil	5
** <i>Dactylorhiza sp.</i>	Orchid	+
** <i>Linum catharticum</i>	Fairy flax	+
<i>Potentilla erecta</i>	Tormentil	1
<i>Hypochaeris radicata</i>	Cat's ear	40
<i>Agrostis capillaris</i>	Common bent	1
<i>Prunella vulgaris</i>	Selfheal	1
<i>Rubus fruticosus agg.</i>	Bramble	10
* <i>Carex flacca</i>	Glaucous sedge	10
<i>Succisa pratensis</i>	Devil's-bit scabious	+

*Denotes Positive indicator species of Annex I habitat [6210]

** Denotes high quality indicator species of Annex I habitat [6210]

Relevé 07 Grid Ref 138220 223720

Scientific Name	Common name	Percentage Cover
<i>Pteridium aquilinum</i>	Bracken	1
* <i>Daucus carota</i>	Wild carrot	2
<i>Centaurea nigra</i>	Common knapweed	40
** <i>Briza media</i>	Quaking grass	3
<i>Senecio jacobea</i>	Common ragwort	1
<i>Holcus lanatus</i>	Yorkshire fog	8
<i>Festuca rubra</i>	Red fescue	3
* <i>Leontodon hispidus</i>	Rough hawkbit	5
* <i>Lotus corniculatus</i>	Bird's-foot trefoil	25
* <i>Galium verum</i>	Lady's bedstraw	3
** <i>Anthyllis vulneraria</i>	Kidney vetch	+
** <i>Dactylorhiza sp.</i>	Orchid	+
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	15
<i>Hypochaeris radicata</i>	Cat's ear	10
<i>Plantago lanceolata</i>	Ribwort plantain	2
<i>Agrostis capillaris</i>	Common bent	5
<i>Trifolium pratense</i>	Red clover	1
<i>Potentilla erecta</i>	Tormentil	2
<i>Achillea millefolium</i>	Yarrow	1
* <i>Carex flacca</i>	Glaucous sedge	5
<i>Succisa pratensis</i>	Devil's-bit scabious	3

*Denotes Positive indicator species of Annex I habitat [6210]

** Denotes high quality indicator species of Annex I habitat [6210]

Relevé 08 138207 223794

Scientific Name	Common name	Percentage Cover
<i>Rhinanthus minor</i>	Yellow rattle	+
* <i>Daucus carota</i>	Wild carrot	1
<i>Centaurea nigra</i>	Common knapweed	5

Scientific Name	Common name	Percentage Cover
**Briza media	Quaking grass	1
<i>Bromus hordeaceus</i>	Soft brome	1
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	2
<i>Festuca rubra</i>	Red fescue	2
*Leontodon hispidus	Rough hawkbit	10
*Lotus corniculatus	Bird's-foot trefoil	10
<i>Leucanthemum vulgare</i>	Ox-eye daisy	1
**Dactylorhiza sp.	Orchid	1
**Linum catharticum	Fairy flax	+
<i>Potentilla erecta</i>	Tormentil	+
<i>Hypochaeris radicata</i>	Cat's ear	45
<i>Holcus lanatus</i>	Yorkshire fog	2
<i>Centaureum pulchellum</i>	Lesser centaury	+
<i>Poa trivialis</i>	Rough meadow-grass	2
<i>Lathyrus pratensis</i>	Meadow vetchling	+
<i>Plantago lanceolata</i>	Ribwort plantain	3
<i>Trifolium pratense</i>	Red clover	2
<i>Rubus fruticosus agg.</i>	Bramble	+
*Carex flacca	Glaucous sedge	15
Bare Rock		8

**Denotes Positive indicator species of Annex I habitat [6210]*

*** Denotes high quality indicator species of Annex I habitat [6210]*

Appendix 5-3

Moneyduff Bird Survey Report

Appendix 5-3

Winter Bird Surveys at Moneyduff, Oranmore, Co. Galway



Planning & Environmental Consultants

DOCUMENT DETAILS

Client: Arlum Ltd.

Project title: Winter Bird Surveys at Moneyduff

Project Number: 181044

Document Title: Bird Survey Report

Doc. File Name: BSR – F – 2019.04.02 – 181044

Prepared By: McCarthy Keville O’Sullivan Ltd.
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Table of Contents

1	Introduction.....	2
1.1	Background to Bird Species of Conservation Interest	3
1.1.1	Annex I Listed Species	3
1.1.2	Birds of Conservation Concern in Ireland 2014-2019	3
1.2	Statement of Authority.....	4
2	Methodology.....	5
2.1	Desk Study	5
2.2	Field Survey Methodology.....	5
2.2.1	I-WeBS Surveys.....	5
2.2.2	Transects.....	5
2.2.3	Survey Details	6
2.2.4	Survey constraints	8
3	Results	9
3.1	Desk study.....	9
3.1.1.1	Breeding and Wintering Bird Atlases.....	9
3.1.1.2	Sites designated for Wintering Bird Species within 10km of the Site of the Proposed Development Site	11
3.1.1.3	Inner Galway Bay SPA (004031).....	13
3.1.1.4	Cregganna Marsh SPA (004142).....	15
3.1.1.5	Rahasane Turlough SPA (004089)	15
3.2	Field survey.....	17
3.2.1	Species records for Moneyduff	17
3.2.2	Species records for Inner Galway Bay SPA	20
3.2.3	Species Records for Cregganna Marsh SPA	21
4	Evaluation & Discussion	23
4.1	Summary of field survey findings	23
5	Conclusion.....	25
6	Bibliography.....	26

1 INTRODUCTION

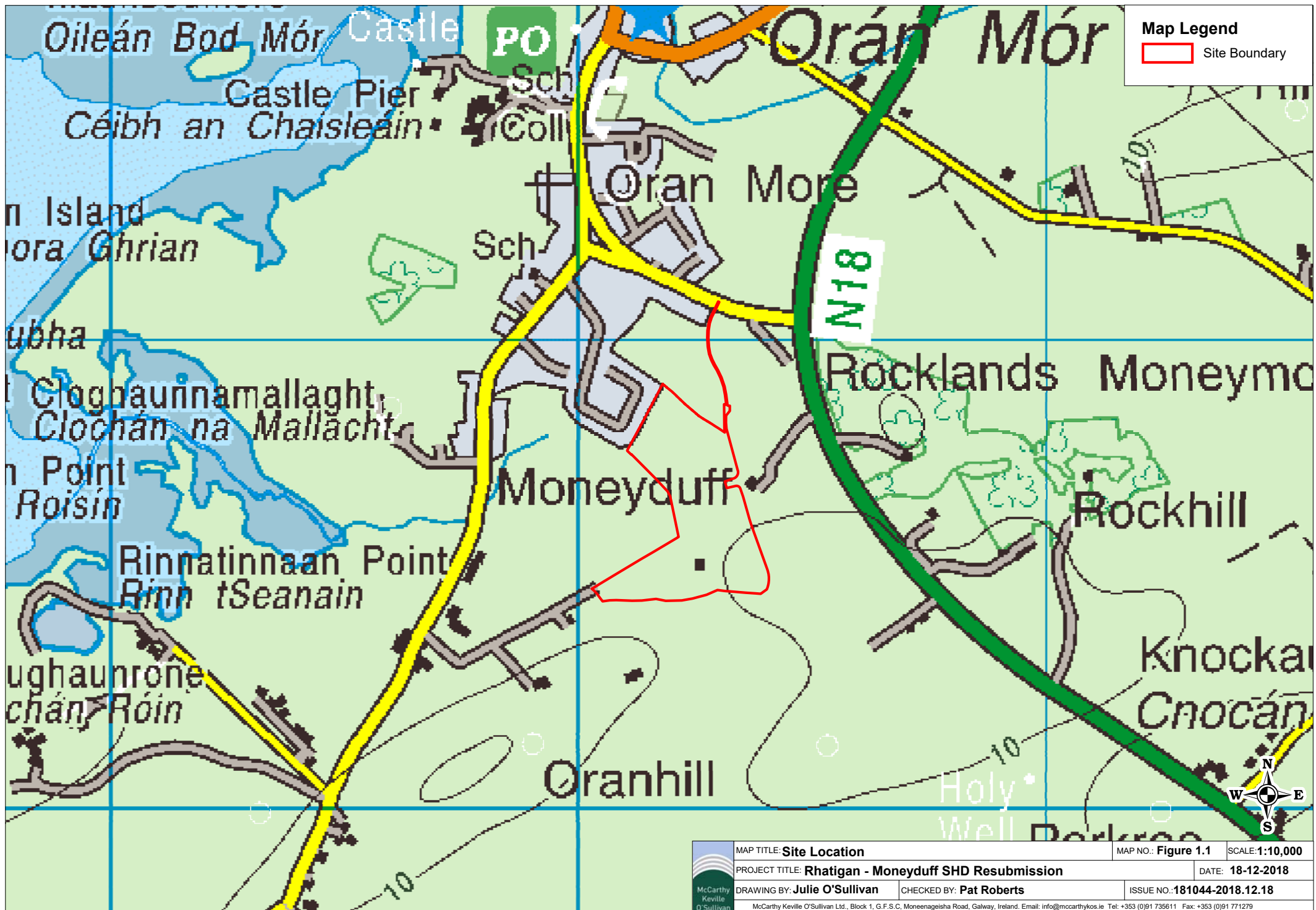
McCarthy Keville O’Sullivan has been engaged by Arlum Ltd. to undertake winter bird surveys for a proposed Strategic Housing Development in the townlands of Moneyduff and Oranhill, Co. Galway. A site location map is provided as Figure 1.1.

In 2018, An Bord Pleanála issued an order to refuse permission for a housing development at the proposed development site (ABP reference 301952-18). Concerns raised in the inspector’s report related to the potential for adverse effects on the integrity of Inner Galway Bay SPA (Site Code: 004031), Cregganna Marsh SPA (004142) and Rahasane Turlough SPA (004089), in view of the sites’ Conservation Objectives and with respect to wintering bird populations.

The objective of this report is to assess the suitability and potential of the development site and surrounding habitat to support a variety of wintering wildfowl and waders, including the bird species listed as Special Conservation Interest (SCIs) for the Inner Galway Bay SPA, Rahasane Turlough SPA and Cregganna Marsh SPA. The assessment objectives can be summarised as follows:

- To undertake field and desktop surveys to assess for the presence of suitable habitat and the occurrence of wintering bird species within and adjacent to the development site.
- To identify and assess the direct, indirect and cumulative effects of the proposed development on wintering bird species, in particular the Special Conservation Interest bird species of the Inner Galway Bay SPA (Site Code: 004031) and the Cregganna Marsh SPA (Site Code: 004142).
- The study seeks to determine the distribution of the species within and adjacent to the proposed development site and to determine the presence of feeding/roosting areas within/adjacent to the proposed development site.

Section two of this report provides the methodology, constraints, survey information, weather conditions and survey coverage. The results of the desk study and field surveys are presented in section three of this report. An evaluation and discussion of the results is provided in Section four. The concluding section of the report considers the findings and potential impacts of the proposal in-combination with other developments within the environs of designated sites.



1.1 BACKGROUND TO BIRD SPECIES OF CONSERVATION INTEREST

1.1.1 Annex I Listed Species

With the introduction of the Birds Directive (79/409/EEC), which was transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 1997 (S.I. No. 94/1997), the European Union formally recognised the significance of protecting rare and endangered species of flora and fauna, and also, more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

The Birds Directive has been substantially amended several times. In the interests of clarity and rationality, the said Directive was codified in 2009 and is now cited as Directive 2009/147/EC. The Directive instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3).

A subset of bird species have been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of, *inter alia*: their risk of extinction; vulnerability to specific changes in their habitat; and/or their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

1.1.2 Birds of Conservation Concern in Ireland 2014-2019

In 2014, BirdWatch Ireland and the Royal Society for the Protection of Birds (RSPB) Northern Ireland provided an updated list of priority bird species for conservation action on the island of Ireland. These Birds of Conservation Concern in Ireland are published in a list known as the BoCCI List. In this BoCCI List, birds that breed and/or winter in Ireland are classified into three separate lists (Red, Amber and Green), based on the conservation status of the bird and hence conservation priority. Birds on the Red List birds are those of highest conservation concern, Amber List birds are of medium conservation concern and the Green List birds are not considered threatened. Those listed on the BoCCI Red List meet one or more of the following criteria:

- Global or European conservation concern
- Historical decline in breeding population (significant decline since 1800 without subsequent recovery)
- Breeding population decline (50% decline of 25 years)
- Non-breeding population decline (50% or greater decline in abundance over 25 years)
- Decline in breeding range (70% or more over 25 years)

Periodic reviews of the status of biodiversity are widely recognised as an important step in conservation priority- setting and are used in many parts of the world. *Birds of Conservation Concern in Ireland 2014-2019* (Colhoun, K. and Cummins, S. 2013) represents the third assessment of the status of all regularly occurring birds on the island of Ireland. The criteria on which the assessment is based included international conservation status, historical breeding declines, recent population declines (numbers

and range in breeding and non-breeding seasons), European conservation status, breeding rarity, localised distribution, and the international importance of populations. Of the 202-species assessed, 37 were placed on the Red list, 91 on the Amber list and 74 on the Green list. The number of Red-listed species has increased by twelve and Amber-listed species by five since the previous review in 2007. Additions to the Red list include the wintering populations of six duck species and to the Red and/or Amber list a suite of passerines which have undergone population declines and/or range contractions.

1.2 STATEMENT OF AUTHORITY

Bird surveys were undertaken by Julie O’Sullivan (B.Sc, M.Sc) with assistance from Irene Sullivan (B.Sc). Julie is an experienced ornithologist with over four years professional experience. Irene is an experienced graduate ecologist with one years’ experience. This report has been prepared by Julie O’Sullivan and David McNicholas of McCarthy Keville O’Sullivan Ltd. David is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over 8 years professional ecological consultancy experience. This report has been reviewed by Pat Roberts (B.Sc. Environmental Science, MCIEEM) who has over 14 years’ experience in management and ecological assessment.

2 METHODOLOGY

2.1 DESK STUDY

A number of sources were assessed to determine the likely usage of the site by both breeding and wintering bird species, including Bird Atlases, National Biodiversity Data Centre (NBDC), BirdWatch Ireland and Conservation Objectives Supporting Documents from the National Parks and Wildlife Service (NPWS) for nearby Special Protection Areas (SPAs). Results of the desk study are provided in section 3.1.

2.2 FIELD SURVEY METHODOLOGY

Prior to the commencement of surveys, an initial field visit was undertaken to assess the habitats on site and plan the surveys as well as to identify suitable vantage points. The survey area covered the development site and the areas surrounding it, including the fen. Surveys were undertaken at the site over six dates; 23rd of October 2018, 30th of November 2018, 16th of December 2018 and 30th of January 2019, 22nd of February and 21st of March.

The surveys were undertaken by appropriately qualified ornithologists. All observations were recorded, and detailed point data was gathered for each species observation, with all bird species denoted using standard British Trust for Ornithology (BTO) codes and with the number of each species recorded next to each registration.

The species recorded in the surveys were those covered by Irish Wetlands Bird Survey (I-WeBS) counts, i.e. all divers, grebes, cormorant, shag, herons, swans, geese, ducks, rails, crakes, waders, gulls and kingfisher. However, in addition to this, all other bird species, including all common and widespread passerines, were also recorded from within the proposed development site.

2.2.1 I-WeBS Surveys

The winter bird surveys at nearby SPAs followed the Irish Wetland Bird Survey (I-WeBS) methodology; the simple 'look-see' method, whereby all birds present within a pre-defined area are counted (Gilbert *et al.*, 2011; Birdwatch Ireland, 2018). The surveys were conducted by appropriately skilled and experienced observers (Julie O'Sullivan with some assistance from Irene Sullivan). The surveys were carried out at suitable vantage points, located overlooking sections of SPAs in close proximity to the proposed development site and were chosen to have as large as possible a view of the identified wetland sites and potential adjacent daytime foraging habitat in the vicinity of the proposed development. Vantage points focused on areas which were deemed to be of likely significance to wintering waterbirds including Inner Galway Bay SPA, Cregganna Marsh SPA and fen habitats outside the western boundary of the development site.

Details of the surveys carried out including date, time, duration, location and weather conditions are provided in Table 2.2. A map of the vantage point locations used during the surveys is presented in Figure 2.1.

2.2.2 Transects

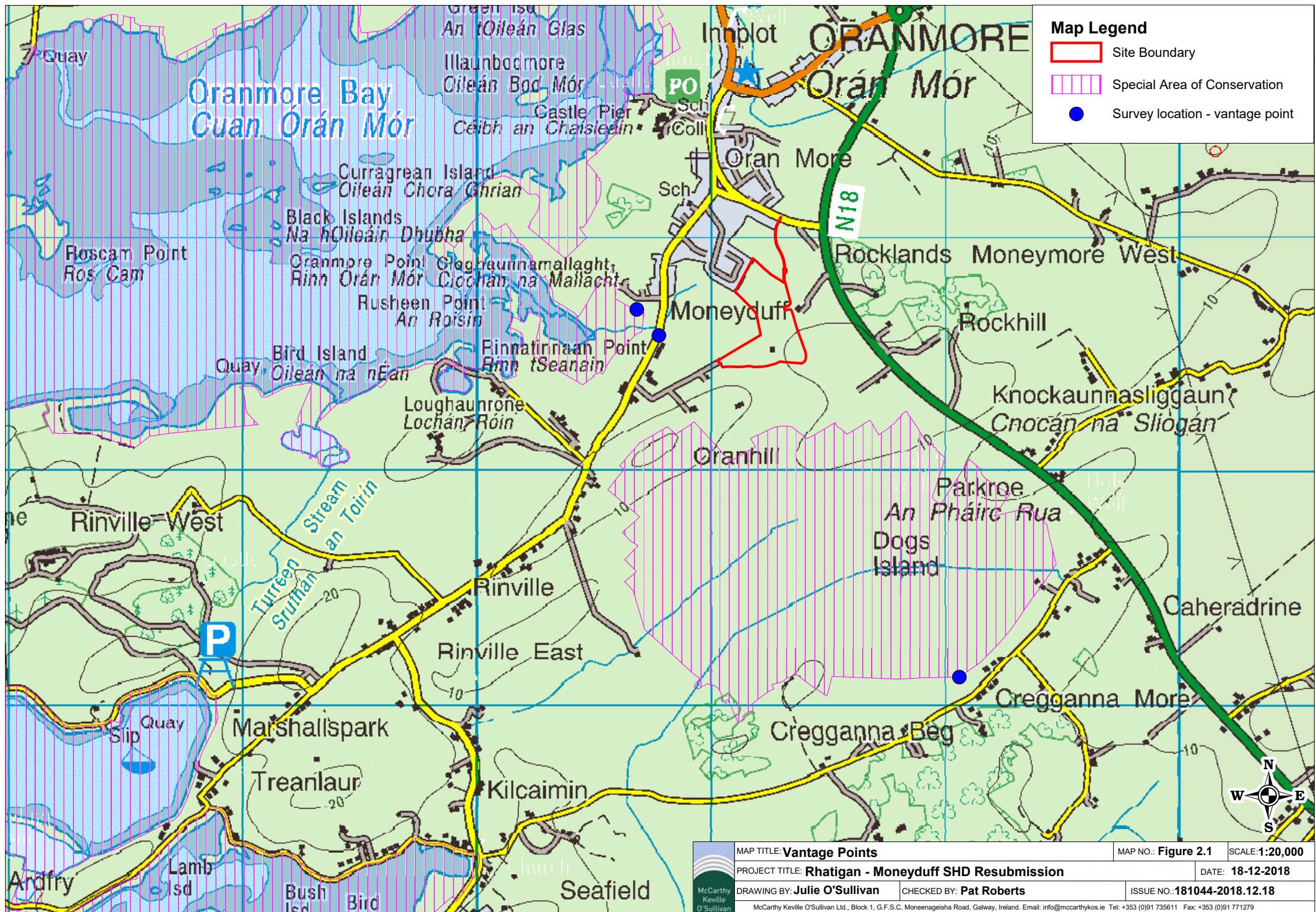
The proposed development site and the surrounding fields and fen were scanned from suitable vantage points that gave unobstructed views of potentially suitable habitat and roosting locations for wintering waterfowl and waders within and adjacent to the study area in advance of walkover surveys. Walked transects were undertaken within the site

boundary. Transects walked are shown in Figure 2.2. During the surveys species of note were recorded both within and adjacent to the development site.

All bird species were denoted using standard British Trust for Ornithology (BTO) codes and with the number of each species recorded next to each registration. The results of surveys are provided in Section 3.2 of this report.

2.2.3 Survey Details

Details of the surveys including survey methodology, dates, weather conditions and survey duration are provided in Table 2.2.



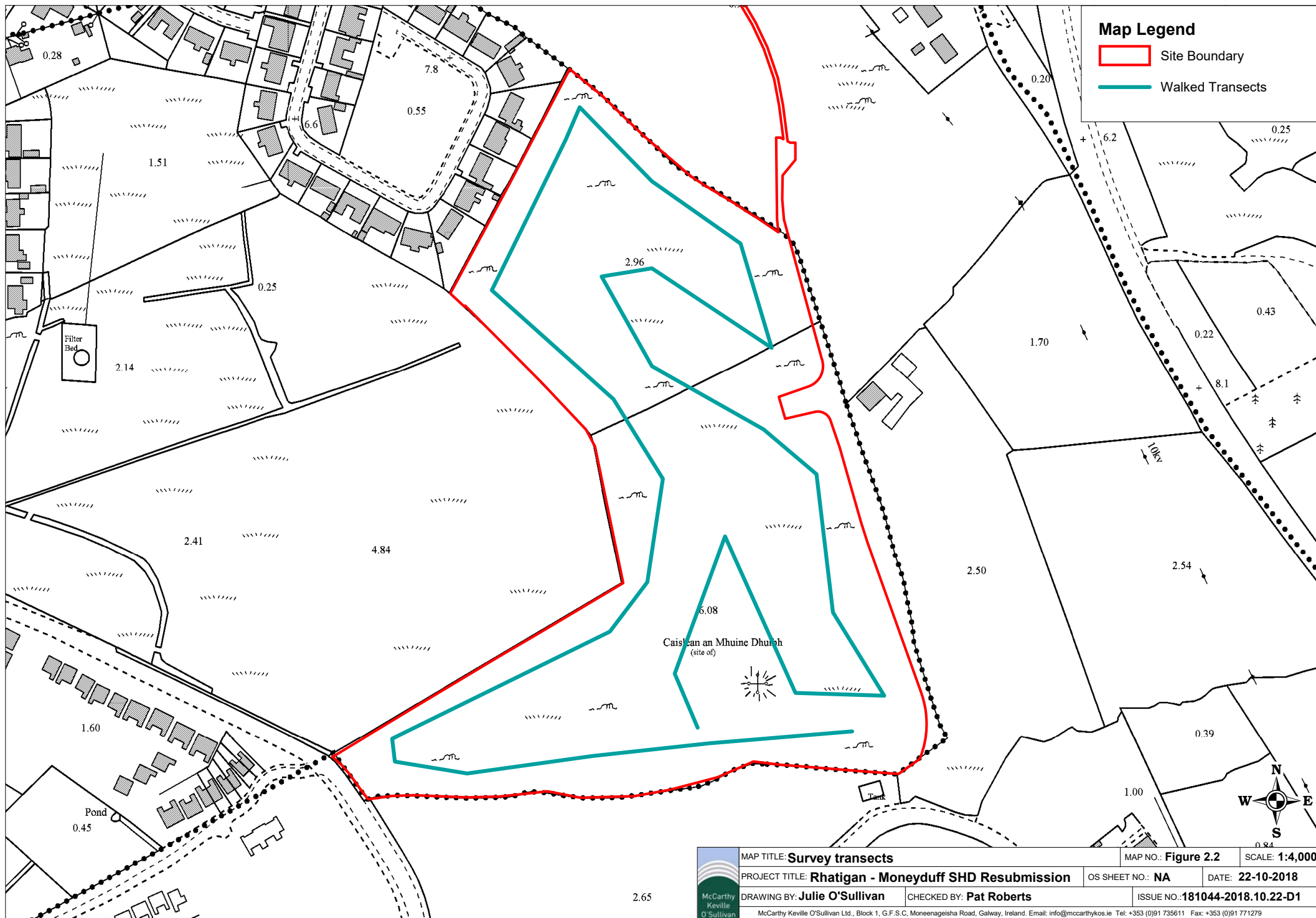


Table 2.2 Survey details for Moneyduff

Date	Survey Method	Survey duration (hrs)	Weather and Tidal Conditions
23/10/2018	Walkover survey	01:00	Wind speed and direction: Fresh Breeze; visibility: Good (>2km); Cloud cover 66-100%; Cloud height >500m; Rain: no rain; Frost: None; Snow: None. Low tide.
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	
30/11/2018	Walkover survey	01:00	Wind speed and direction: Fresh Breeze; visibility: Good (>2km); Cloud cover 33-66%; Cloud height >500m; Rain: Light showers; Frost: None; Snow: None High tide.
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	
16/12/2018	Walkover survey	01:00	Wind Speed and Direction: gentle Breeze; Visibility: Good (>2km); Cloud Height: >500m; Cloud Cover %: 66-100 Rain: Light Showers; Frost: None; Snow: None. Low tide.
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	
30/01/2019	Walkover survey	01:00	Wind Speed and Direction: Calm; Visibility: Good (>2km); Cloud Height: >500m; Cloud Cover %: 0-33 Rain: None; Frost: None; Snow: None. High tide.
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	
22/02/2019	Walkover survey	01:00	Wind Speed and Direction: light breeze; Visibility: Good (>2km); Cloud Height: >500m; Cloud Cover %: 0-33 Rain: occasional showers; Frost: None; Snow: None. Low tide
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	

21/03/2019	Walkover survey	01:00	Wind Speed and Direction: Calm; Visibility: Good (>2km); Cloud Height: >500m; Cloud Cover %: 66-100 Rain: None; Frost: None; Snow: None. High tide.
	IWeBS – Inner Galway Bay SPA	01:30	
	IWeBS – Cregganna Marsh SPA	01:00	

2.2.4 Survey constraints

Constraints and limitations of the survey were identified during the course of undertaking the surveys. Examples of survey limitations and survey constraints are listed in the following sub-sections. However, no significant survey constraints limited the survey approach and a comprehensive assessment was undertaken.

Surveys were undertaken during optimal weather conditions where possible as poor weather conditions and high wind can lead to decreased bird movements and hinder surveyor visibility.

All lands within the proposal boundary were accessible during the survey visits. Surrounding private lands were not accessed. However, these lands were scanned using a spotting scope from elevated vantage points along the public road. Any significant flocks of wintering wildfowl or waders would be recorded using such an approach.

3 RESULTS

3.1 DESK STUDY

A number of sources were assessed to determine the likely usage of the site by both breeding and wintering bird species, including Bird Atlases, National Biodiversity Data Centre (NBDC), BirdWatch Ireland and Conservation Objectives Supporting Documents from the National Parks and Wildlife Service (NPWS) for nearby Special Protection Areas (SPAs).

3.1.1.1 Breeding and Wintering Bird Atlases

The *Bird Atlas 2007-11: The breeding and wintering birds of Britain and Ireland* (Balmer *et al.*, 2013) provides the most up-to-date information regarding the distribution and relative abundance of bird species in Britain and Ireland, based on surveys carried out between 2007 and 2011.

The atlases show data for breeding and wintering birds respectively in individual 10 km x 10 km squares (hectads). Table 3.1 shows those species found in the relevant hectad (M32), which are recorded as breeding in the most recent atlas. It also provided species that have been recorded within the relevant hectad on National Biodiversity Data Centre (NBDC) datasets as well as those listed in Annex I of the EU Birds Directive recorded on the BoCCI Red List. Birds listed under Annex I are offered special protection by the EU Birds Directive. Those listed on the Birds of Conservation Concern in Ireland (BoCCI) Red List meet one or more of the following criteria:

- IUCN: Global conservation status (Critically Endangered (CE), Endangered (E) or Vulnerable (V), but not Near Threatened. These species are recognised as the highest priorities for action at a global scale and are thus priorities at an all-Ireland level.
- European conservation status. The conservation status of all European species was assessed most recently by Birdlife International (2004), one of the main changes in the revision being to include the IUCN criteria. These species are those of global conservation concern (including those classified as Near Threatened) and are Red-listed.
- The Irish breeding population has undergone significant historical decline since 1800.
- The Irish breeding population or range has declined by 50% or- more in the thirteen years from 1998-2011 (BDp1) or the 25 years from 1980-2013 (BDp2).
- The Irish non-breeding population has undergone a significant decline of 50% in the last 25 years.
- The Irish breeding range has undergone a decline of 70% or more in the last 25 years.

Four species listed under Annex I of the EU Birds Directive have been recorded within the relevant tetrad (M32W & M32R). A further six red-listed birds of conservation concern have been recorded breeding within the relevant tetrad (Table 4.2). It should be noted that these species are predominantly associated with coastal and marine habitats and are unlikely to occur within the habitats found on site.

Table 3.1 – Bird Atlas and NBDC Bird Data (Tetrad M32W & M32R)

Common name	Scientific name	Bird Atlas (Hectad (M32))		Designation
		Breeding 2008-2011	Wintering 2007-2011	
Greenland white-fronted goose	<i>Anser albifrons</i>	No	Present	Protected EU Birds Directive Annex I Bird Species
Dunlin	<i>Calidris alpina</i>	Present (non-breeding)	Present	
Little egret	<i>Egretta garzetta</i>	Confirmed	Present	
Common tern	<i>Sterna hirundo</i>	Confirmed	No	
Northern pintail	<i>Anas acuta</i>	No	Present	Birds of Conservation Concern – Red list
Common redshank	<i>Tringa totanus</i>	Present (non-breeding)	Present	
Northern lapwing	<i>Vanellus vanellus</i>	Confirmed	Present	
Eurasian curlew	<i>Numenius arquata</i>	Present (non-breeding)	Present	
Herring gull	<i>Larus argentatus</i>	Present (non-breeding)	Present	
Black-headed gull	<i>Larus ridibundus</i>	Confirmed	Present	
Barn owl	<i>Tyto alba</i>	Confirmed	No	

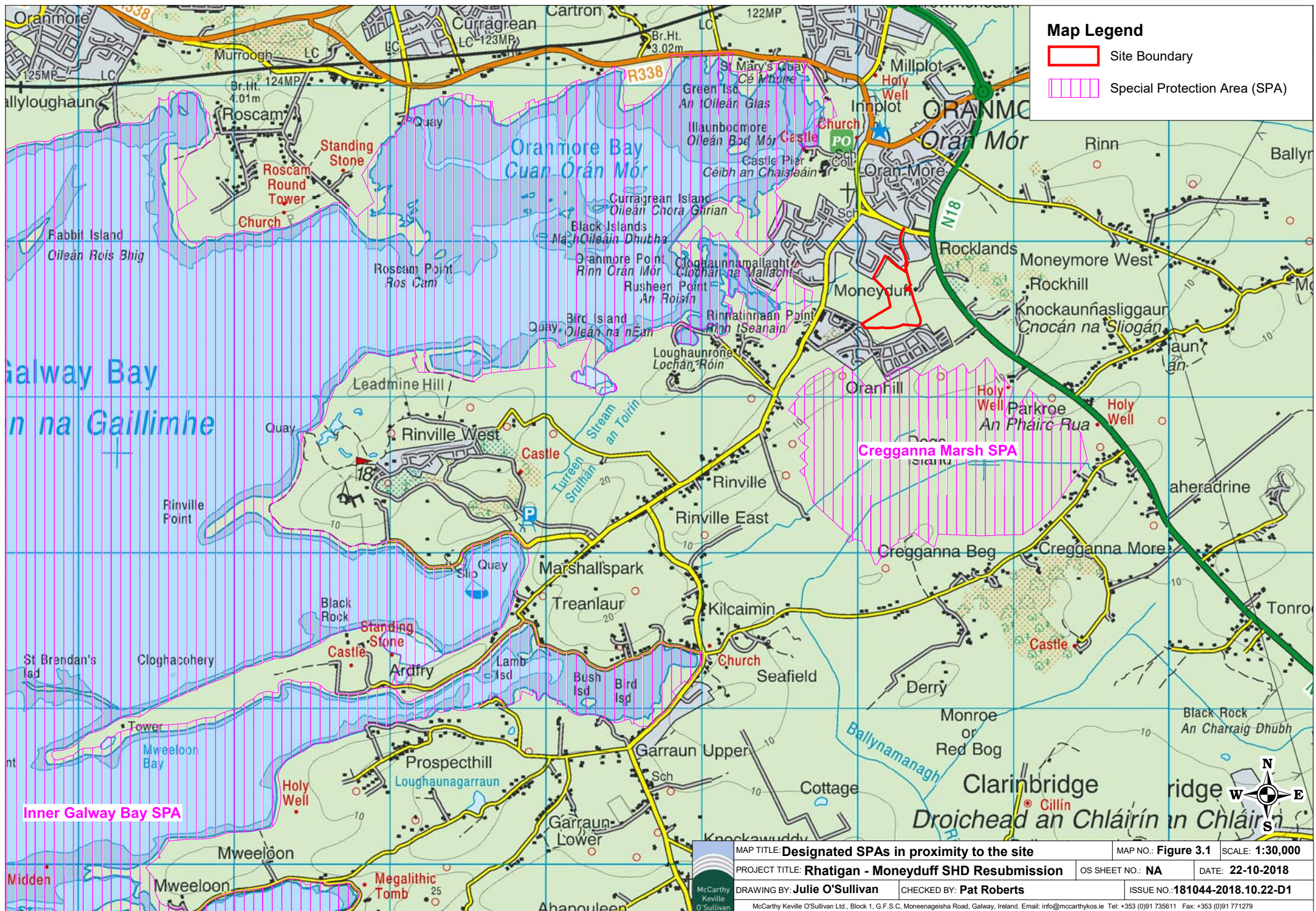
3.1.1.2 Sites designated for Wintering Bird Species within 10km of the Site of the Proposed Development Site

Using the GIS software, MapInfo (Version 10.0), designated sites within a 10km radius of the proposed development site were identified. The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were considered at the time of preparation of this report (22/03/2019). Details of these sites, including their distance from the proposed development site, are provided in Table 3.1. Figure 3.1 shows the location of the proposed works in relation to all sites designated for wintering bird species within 10 km.

Table 3.2. EU Designated sites within 10 kilometres of the Proposed Works

EU Designated Site	Distance from Proposed development site (km)	Qualify Interests/Special Conservation Interests for which the Natura 2000 Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 22/03/2019)	Conservation Objective
Inner Galway Bay SPA (004031)	0.34km	<ul style="list-style-type: none"> Great Northern Diver (<i>Gavia immer</i>) [A003] Cormorant (<i>Phalacrocorax carbo</i>) [A017] Grey Heron (<i>Ardea cinerea</i>) [A028] Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Wigeon (<i>Anas penelope</i>) [A050] Teal (<i>Anas crecca</i>) [A052] Shoveler (<i>Anas clypeata</i>) [A056] Red-breasted Merganser (<i>Mergus serrator</i>) [A069] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Lapwing (<i>Vanellus vanellus</i>) [A142] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Turnstone (<i>Arenaria interpres</i>) [A169] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] Sandwich Tern (<i>Sterna sandvicensis</i>) [A191] Common Tern (<i>Sterna hirundo</i>) [A193] 	<p>This site has site specific conservation objectives (Version 1, 2013). Each species has the conservation objective to:</p> <p><i>“Maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.”</i></p> <p>This site has the additional conservation objective:</p> <p><i>“To maintain the favourable conservation condition of wetland habitat in Inner Galway Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it,”</i> (Version 1, NPWS, 2013)</p>

EU Designated Site	Distance from Proposed development site (km)	Qualify Interests/Special Conservation Interests for which the Natura 2000 Site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 22/03/2019)	Conservation Objective
Cregganna Marsh SPA (004142)	0.26km	<ul style="list-style-type: none"> Wetland and Waterbirds [A999] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] 	<p>This site has the generic conservation objective to:</p> <p><i>“Maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA,”</i> [Generic Version 6.0, NPWS, 2018]</p>
Rahasane Turlough SPA (004089)	8.84km	<ul style="list-style-type: none"> Whooper Swan (<i>Cygnus cygnus</i>) [A038] Wigeon (<i>Anas penelope</i>) [A050] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395] Wetland and Waterbirds [A999] 	<p>This site has the generic conservation objective to:</p> <p><i>“Maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.”</i></p> <p>and the additional conservation objective:</p> <p><i>“To maintain the favourable conservation condition of wetland habitat in Rahasane Turlough SPA as a resource for the regularly occurring migratory waterbirds that utilise it,”</i> [Generic Version 6.0, NPWS, 2018].</p>



3.1.1.3 Inner Galway Bay SPA (004031)

A detailed conservation objectives document is available for Inner Galway Bay SPA (www.npws.ie, accessed on 22/03/2019). The Special Conservation Interests of Inner Galway Bay SPA and the conservation objective for each species is listed in Table 3.2.

Table 3.2 Special Conservation Interests of Inner Galway Bay SPA (004031)

Special Conservation Interests	Conservation Objective
Common Gull (<i>Larus canus</i>) [A182]	Maintain the favourable conservation condition of the Special Conservation Interest of Inner Galway Bay SPA.
Great Northern Diver (<i>Gavia immer</i>) [A003]	
Cormorant (<i>Phalacrocorax carbo</i>) [A017]	
Grey Heron (<i>Ardea cinerea</i>) [A028]	
Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]	
Wigeon (<i>Anas penelope</i>) [A050]	
Teal (<i>Anas crecca</i>) [A052]	
Shoveler (<i>Anas clypeata</i>) [A056]	
Red-breasted Merganser (<i>Mergus serrator</i>) [A069]	
Ringed Plover (<i>Charadrius hiaticula</i>) [A137]	
Golden Plover (<i>Pluvialis apricaria</i>) [A140]	
Lapwing (<i>Vanellus vanellus</i>) [A142]	
Dunlin (<i>Calidris alpina</i>) [A149]	
Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]	
Curlew (<i>Numenius arquata</i>) [A160]	
Redshank (<i>Tringa totanus</i>) [A162]	
Turnstone (<i>Arenaria interpres</i>) [A169]	
Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]	
Sandwich Tern (<i>Sterna sandvicensis</i>) [A191]	
Common Tern (<i>Sterna hirundo</i>) [A193]	
Wetland and Waterbirds [A999]	To maintain the favourable conservation condition of wetland habitat in Inner Galway Bay SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

A review of desktop literature pertaining to the SPA was conducted. The Site Synopsis, as updated in 2014, states;

“Inner Galway Bay supports an excellent diversity of wintering wetland birds, with divers, grebes, cormorants, dabbling duck, sea duck and waders all well represented. There are internationally important wintering populations of Great Northern Diver (88) and Light-Bellied Brent Goose (676) and nationally important wintering populations of an additional sixteen species i.e. Cormorant (266), Grey Heron (102), Wigeon (1,168), Teal (700), Shoveler (88),

Red-breasted Merganser (249), Ringed Plover (335), Golden Plover (2,030), Lapwing (3,969), Dunlin (2,155), Bar-tailed Godwit (447), Curlew (697), Redshank (505), Turnstone (182), Black-headed Gull (1,941) and Common Gull (1,066) - all figures given are five year mean peaks for the seasons 1995/96 to 1999/2000. Of note is that the populations of Red-breasted Merganser and Ringed Plover represent 6.8% and 2.3% of the respective all-Ireland totals. Other species which occur in notable numbers include Black-throated Diver (36), Little Grebe (35), Long-tailed Duck (21), Scaup (44) and Herring Gull (216). In addition, the following species also use the site: Great Crested Grebe (16), Mallard (200), Common Scoter (87), Oystercatcher (576), Grey Plover (60), Black-tailed Godwit (46), Mute Swan (150) and Great Black-backed Gull (129). The site provides both feeding and roost sites for most of the species. Little Egret, a species which has recently colonised Ireland, also occurs at this site”.

A review of the Inner Galway Bay conservation objectives supporting document (version 1) pertaining to the SPA was conducted. This document indicates that the subsite Oranmore Bay (0G495) was surveyed as part of the Inner Galway Bay Survey Programme 2009/10. Data indicates that this subsite is among the most species rich of the subsites surveyed, with mean numbers of 25 and a peak of 27 species recorded on one low tide occasion. A summary of data collect over six surveys of the site at low tide is presented in Table 3.3.

Table 3.3 Inner Galway Bay SPA subsite assessment survey 2009/2010

Species	Total numbers
Common Gull (<i>Larus canus</i>)	High
Great Northern Diver (<i>Gavia immer</i>)	Not recorded
Cormorant (<i>Phalacrocorax carbo</i>)	High
Grey Heron (<i>Ardea cinerea</i>)	Very high
Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)	Not recorded
Wigeon (<i>Anas penelope</i>)	Very high
Teal (<i>Anas crecca</i>)	Very high
Shoveler (<i>Anas clypeata</i>)	Low
Red-breasted Merganser (<i>Mergus serrator</i>)	Moderate
Ringed Plover (<i>Charadrius hiaticula</i>)	Not recorded
Golden Plover (<i>Pluvialis apricaria</i>)	Very high
Lapwing (<i>Vanellus vanellus</i>)	Very high
Dunlin (<i>Calidris alpina</i>)	High
Bar-tailed Godwit (<i>Limosa lapponica</i>)	High
Curlew (<i>Numenius arquata</i>)	Very high
Redshank (<i>Tringa totanus</i>)	Very high
Turnstone (<i>Arenaria interpres</i>)	High
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	High
Sandwich Tern (<i>Sterna sandvicensis</i>)	Not recorded
Common Tern (<i>Sterna hirundo</i>)	Not recorded

The Inner Galway Bay conservation objectives supporting document includes data on roosting birds within Oranmore Bay. Data collected during the winters of 2005/06 & 2007/08 indicate that Oranmore Bay is an important roost location for Golden Plover and Lapwing. A roost survey carried out in February 2010 indicated two individual roost locations within the bay, with 308 waterbirds recorded with species including black-headed gull, cormorant, curlew, dunlin, lapwing, oystercatcher and turnstone. These two roost locations are not in close proximity to the proposed development site, occurring along the north eastern shore of Oranmore Bay and along the northern shore.

3.1.1.4 Cregganna Marsh SPA (004142)

A generic conservation objectives document is available for Cregganna Marsh SPA (www.npws.ie, accessed on 22/03/2019). The Special Conservation Interests of Cregganna Marsh SPA and the conservation objective for each species is listed in Table 3.3 below.

Table 3.3 Special Conservation Interests of Cregganna Marsh (004142)

Special Conservation Interests	Conservation Objective
Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	Maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA," (Generic Version 6.0, NPWS, 2018)

A review of desktop literature pertaining to the SPA was conducted. The Site Synopsis, as updated in 2015, states; states that the population of Greenland White Fronted Goose for which the SPA was designated was a sub-population of the population that form the Rahasane flock. The standard data form, updated in 2017, lists the population size as 129 individuals and states;

"Cregganna Marsh is of importance as it is the principal alternative feeding site for the nationally important population of Anser albifrons flavirostris that is based at nearby Rahasane turlough. Numbers using Cregganna Marsh vary between winters but in most winters the qualifying threshold for national importance is exceeded".

3.1.1.5 Rahasane Turlough SPA (004089)

A generic conservation objective document is available for Lough Gara (www.npws.ie, accessed on 23/03/2019). The Special Conservation Interest of Rahasane Turlough SPA and the conservation objectives for the species is listed in Table 3.4 below.

Table 3.4 Special Conservation Interests of Rahasane Turlough SPA (004089)

Special Conservation Interests	Conservation Objective
Greenland White Fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]	Maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.
Whooper Swan (<i>Cygnus cygnus</i>) [A395]	
Wigeon (<i>Anas penelope</i>) [A050]	
Golden Plover (<i>Pluvialis apricaria</i>) [A140]	

Special Conservation Interests	Conservation Objective
Black-tailed Godwit (<i>Limosa limosa</i>) [A156]	To maintain the favourable conservation condition of wetland habitat in Rahasane Turlough SPA as a resource for the regularly occurring migratory waterbirds that utilise it.
Wetland and Waterbirds [A999]	

The following extract has been taken from the Site Synopsis;

“Rahasane is a traditional site for Greenland White-fronted Goose, and supports a population of national importance (157 individuals - five year mean peak for the period 1994/95 to 1998/99). It is of international importance for Black-tailed Godwit (437 - all figures are five year mean peaks for the period 1995/96 to 1999/2000). It also has nationally important populations of Whooper Swan (165), Wigeon (3,430), and Golden Plover (6,613). The site has the largest inland population of Dunlin (864) in the country and also supports Mute Swan (57), Teal (307), Mallard (142), Pintail (19), Shoveler (28), Tufted Duck (32), Grey Heron (31), Lapwing (2,220), Curlew (197), Redshank (134) and Black-headed Gull (280). Little Egret, a species which has recently colonised Ireland, also occurs at this site”.

3.2 FIELD SURVEY

The following sections provide the results of each of the site visits undertaken. The number of individual birds and any significant flocks is provided for each survey date.

3.2.1 Species records for Moneyduff

Table 3.1 provides an overview of the target species and species of conservation interest recorded during the surveys carried out between October and March 2019. Non-target bird species recorded within the development site are presented in Table 3.2 along with their Birds of Conservation Concern in Ireland (BoCCI) status. No target bird species were recorded roosting or feeding within the proposed development site, the fen or in the surrounding habitats, during walkover surveys. There were six observations of Special Conservation Interest species associated with the Inner Galway Bay SPA; including three observations of Curlew flying over the site during surveys in October and November and two observations of Black-headed Gull flying over the development site; one individual was recorded during the November surveys and one individual was recorded during January surveys. An individual grey heron was recorded in flight over the development site in February 2019. A peregrine was recorded hunting over the south eastern boundary of the development site. Twelve snipe were recorded within the grassland surveys during October, November, January, February and March surveys. Bird flightlines recorded during the survey are provided in Figure 3.2.

Table 3.1 Target bird survey results for Moneyduff

Common Name	Number of Individuals	Notes	Date	Conservation status
Curlew (<i>Numenius arquata</i>)	2	Two individuals recorded in flight outside of the site boundary, over the fen west of the site, heading west.	23/10/2018	Birds of Conservation Concern – Red list SCI of Inner Galway Bay
Curlew (<i>Numenius arquata</i>)	1	One individual recorded in flight over site heading west, over fen habitat.	29/11/2018	Birds of Conservation Concern – Red list SCI of Inner Galway Bay
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	1	One individual recorded flying north-east over the development site.	29/11/2018	Birds of Conservation Concern – Red list SCI of Inner Galway Bay
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	1	One individual recorded flying west over the development site.	30/01/2019	Birds of Conservation Concern – Red list SCI of Inner Galway Bay

Common Name	Number of Individuals	Notes	Date	Conservation status
Peregrine (<i>Falco peregrinus</i>)	1	Hunting outside south-east corner of the development site.	29/11/2018	Annex I
Snipe (<i>Gallinago gallinago</i>)	3	Three individuals flushed from grassland habitats.	23/10/2018	Birds of Conservation Concern – Amber list
Snipe (<i>Gallinago gallinago</i>)	3	Three individuals flushed from grassland habitats.	29/11/2018	Birds of Conservation Concern – Amber list
Snipe (<i>Gallinago gallinago</i>)	1	Individual flushed from grassland.	30/01/2019	Birds of Conservation Concern – Amber list
Snipe (<i>Gallinago gallinago</i>)	4	Four individuals flushed from grassland habitats.	22/02/2019	Birds of Conservation Concern – Amber list
Grey Heron (<i>Ardea cinerea</i>)	1	One individual recorded in flight over south-western portion of the site, flying in a south-westerly direction	22/02/2019	SCI of Inner Galway Bay
Herring Gull (<i>Larus argentatus</i>)	1	Individual spotted flying over the site.	22/02/2019	Birds of Conservation Concern – Red list
Snipe (<i>Gallinago gallinago</i>)	1	Individual flushed from grassland habitat.	21/03/2019	Birds of Conservation Concern – Amber list

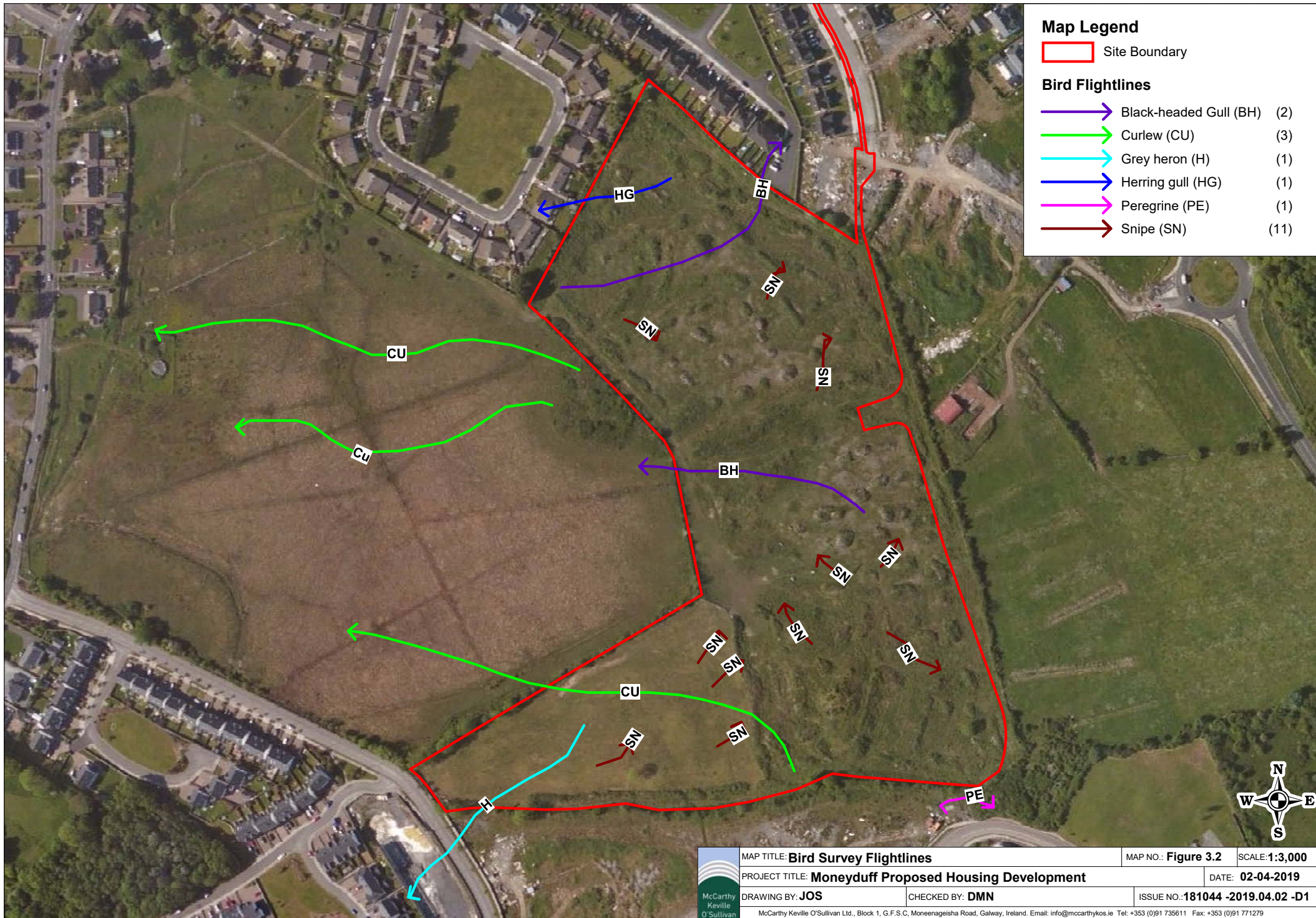


Table 3.2 Non-target bird species recorded at Moneyduff (Within the development site)

Common Name	Scientific Name	BoCCI Status	Date recorded
Blackbird	<i>Turdus merula</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Blue tit	<i>Parus caeruleus</i>	Green	23/10/2018 29/11/2018 22/02/2019 21/03/2019
Chaffinch	<i>Fringilla coelebs</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Duncock	<i>Prunella modularis</i>	Green	23/10/2018 29/11/2018
Goldfinch	<i>Corvus monedula</i>	Green	23/10/2018
Great Tit	<i>Parus major</i>	Green	22/02/2019 21/03/2019
Hooded Crow	<i>Corvus cornix</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Jackdaw	<i>Corvus monedula</i>	Green	23/10/2018 29/11/2018 22/02/2019 21/03/2019
Lesser redpoll	<i>Carduelis flammea cabaret</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019
Linnet	<i>Carduelis cannabina</i>	Amber	23/10/2018
Long Tailed-tit	<i>Aegithalus caudatus</i>	Green	23/10/2018
Magpie	<i>Pica pica</i>	Green	23/10/2018 29/11/2018 22/02/2019 21/03/2019
Meadow Pipit	<i>Anthus pratensis</i>	Red (breeding)	22/02/2019
Mistle thrush	<i>Turdus viscivorus</i>	Amber (Breeding)	23/10/2018 29/11/2018 22/02/2019 21/03/2019

Robin	<i>Erithacus rubecula</i>	Amber (breeding)	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Rook	<i>Corvus frugilegus</i>	Green	23/10/2018 29/11/2018 22/02/2019 21/03/2019
Song thrush	<i>Turdus philomelos</i>	Green	16/12/2018 22/02/2019
Starling	<i>Sturnus vulgaris</i>	Amber (breeding)	29/11/2018
Wood pigeon	<i>Columba palumbus</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Wren	<i>Troglodytes troglodytes</i>	Green	23/10/2018 29/11/2018 16/12/2018 22/02/2019 21/03/2019
Stonechat	<i>Saxicola rubicola</i>	Amber (breeding)	22/02/2019

3.2.2 Species records for Inner Galway Bay SPA

A section of Inner Galway Bay SPA, approximately 370m west of the development site was surveyed. The vantage point overlooked an area of saltmarsh and mudflat in order to record bird distribution during high and low tide and to determine whether birds listed as Qualifying interests of the Inner Galway Bay SPA may utilize habitats within the development site. During the surveys there were no movements of wintering wildfowl and waders between this SPA and the site. Table 3.3 provides an overview of the species recorded.

Table 3.3 Bird survey results for Inner Galway Bay SPA.

Common Name	Number of Individuals	Notes	Date and Tidal conditions
Curlew	3	Mudflat – roosting/feeding	23/10/2018 (Low tide)
Curlew	2	Saltmarsh – flying over	
Mute Swan	3	Mudflat – roosting/feeding	
Mallard	2	Mudflat – roosting/feeding	
Teal	9	Mudflat – feeding	
Lapwing	50	Flying over	29/11/2018 (High tide)
Curlew	4	Flying over	
Black-headed Gull	5	Flying over	
Teal	15	Mudflat – roosting/feeding	
Mallard	3	Mudflat – roosting/feeding	
Redshank	1	Mudflat – roosting/feeding	
Greenshank	4	Mudflat – roosting/feeding	
Dunlin	45	Mudflat – roosting/feeding	16/12/2018
Curlew	1	Flying over	

Lapwing	200	Flying over	(Low tide)
Teal	15	Mudflat – roosting/feeding	
Redshank	16	Mudflat – roosting/feeding	
Herring gull	4	Mudflat – roosting/feeding	
Curlew	2	Mudflat – roosting/feeding	
Redshank	16	Mudflat – roosting/feeding	
Dunlin	34	Mudflat – roosting/feeding	30/01/2019 (High tide)
Teal	47	Mudflat – roosting/feeding	
Black-headed Gull	1	Flying over	
Grey Heron	1	Mudflat – roosting/feeding/ flying over.	
Little egret	1	Mudflat – roosting/feeding	
Black-headed Gull	5	Mudflat – roosting/feeding	22/02/2019 (Low tide)
Curlew	3	Mudflat – roosting/feeding	
Redshank	12	Mudflat/bay – roosting/feeding	
Teal	45-50	Mudflat/bay – roosting/feeding	
Wigeon	50-60	Mudflat/bay – roosting/feeding	
Shoveller	1	Mudflat/bay – roosting/feeding	
Mallard	10	Mudflat/bay – roosting/feeding	
Snipe	1	Flushed during otter survey where tributary stream enters bay	21/03/2019 (High tide)
Teal	23	Mudflat – roosting/feeding	
Redshank	46	Mudflat – roosting/feeding	
Curlew	1	Saltmarsh – roosting/feeding	
Wigeon	1	Mudflat – roosting/feeding	
Oystercatcher	1	Flying over bay	

3.2.3 Species Records for Cregganna Marsh SPA

Cregganna Marsh SPA, approximately 390m south of the development site was surveyed, to determine whether Greenland White-fronted Geese, listed as Qualifying interests of Cregganna Marsh SPA, were moving between the SPA and the proposed development site. Table 3.4 provides an overview of the species recorded. Greenland White-fronted Geese were not recorded at Cregganna Marsh SPA during any of the surveys.

Table 3.4 Bird survey results for Cregganna Marsh SPA.

Common Name	Number of Individuals	Notes	Date
Hen Harrier	1	Female Hunting over grassland and marsh habitats to the north of the SPA	23/10/2018
Whooper Swan	4	In flight over marsh	
Little Egret	1	In flight over marsh	
Peregrine	1	Hunting over marsh	

Lapwing	250	Large flock in flight over grassland to the north west of the SPA. Roosting in fields to the north west of the SPA	29/11/2018
Teal	1	Calling	30/01/2018
Peregrine	1	Flying over	30/01/2018
Grey Heron	1	In flight over the marsh.	22/02/2019
Mallard	1	Rose in flight from feeding/roosting within the marsh.	
Little Egret	1	In flight over marsh.	
Mallard	2	Flying over marsh	21/03/2019

4 EVALUATION & DISCUSSION

4.1 SUMMARY OF FIELD SURVEY FINDINGS

The surveys undertaken over the winter 2018 - 2019 season provide an understanding of the usage of the development site by wintering bird species. A total of 25 bird species were recorded within or immediately adjacent to the proposed development site during winter site visits. The majority of the bird species recorded within the site boundaries and in the surrounding habitats including the fen, during the site visit were an assemblage of common birds that are typical of the scrub, grassland and urban habitats in the area. Only one Annex I bird species, peregrine, was recorded hunting over the proposed development site on one occasion.

There were only five observations of Special Conservation Interests (SCIs) of Inner Galway Bay SPA in flight over the development site or the surrounding area including the fen, and these were recorded during the October, November and January surveys, including three curlew, nine black-headed gulls. No SCIs of Inner Galway Bay SPA were recorded roosting or feeding within the proposed development site during the surveys.

There were no observations of Greenland white-fronted goose, listed as a Special Conservation Interest for Cregganna Marsh SPA, either within the proposed development site or within Cregganna Marsh during the winter surveys.

Based on the findings of the field study, and the habitat composition, this site and the surrounding habitats including the fen, do not provide a significant area of suitable wintering habitat for wintering wildfowl or waders listed as SCIs for Inner Galway Bay SPA and Cregganna Marsh SPA. Habitats within the development site are predominantly comprised of calcareous grassland, scrub and hedgerow habitats, evaluated as Low Importance (local value). Species listed are unlikely to depend on the habitats within the development site.

Greenland white-fronted goose, an SCI of Cregganna Marsh SPA, traditionally winter on peatland habitats; however, in recent times are mostly seen in areas of intensively managed pasture. Waders listed as SCIs of Inner Galway Bay SPA, including ringed plover, golden plover, lapwing, dunlin, bar-tailed godwit, curlew, turnstone and redshank are generally associated with coastal habitats. Golden plover are regularly found in large, densely-packed flocks, and in a variety of habitats, both coastal and inland. Dunlin are generally found in coastal habitats, however the species is occasionally found inland in the vicinity of lakes and turloughs. Curlew winter on a wide range of wetland habitats, both coastal and inland, and are commonly seen feeding in damp fields. Lapwing wintering distribution in Ireland is widespread. This species utilises a variety of habitats including major wetlands, pasture and rough land adjacent to bogs. Redshank winters all around the Irish coast favoring mudflats, large estuaries and inlets, however, small numbers also occur at inland lakes and rivers.

Waterfowl listed as SCIs of Inner Galway Bay SPA, including light-bellied brent goose, wigeon, teal, shoveler and red-breasted Merganser are generally associated with a variety of coastal, marine and inland freshwater habitats. Common tern and sandwich terns are associated with coastal and marine habitats, marshes and lake islands. Common gull and black-headed gull are very adaptable and utilise a wide variety of habitats including urban, coastal, marine and wetland habitats. Similarly, cormorant and grey heron can be found in a wide variety of coastal, marine and wetland habitats. None of these habitats occur within the development boundary or in the surrounding habitats including the fen, and there is therefore no potential for loss of supporting habitat for SCI species for which surrounding SPAs have been designated.

5 CONCLUSION

Based on the wintering bird assemblages recorded over the six survey dates between October 2018 and March 2019 it can be concluded that the site and the surrounding habitats including the fen, does not support important assemblages of wintering wildfowl, waders or species for which the Inner Galway Bay SPA and Cregganna Marsh SPA are designated. Only three species listed as Special Conservation Interests for the Inner Galway Bay SPA were recorded during the surveys, flying over the development site and the fen.

It can therefore be considered that given the low numbers of wintering bird species recorded using the site and the adjacent fen (all of which are common and widespread) there is no potential for significant impact on wintering bird species in the area.

No potential for adverse effects on the SCI species for which Inner Galway Bay SPA and Cregganna Marsh SPA have been designated has been identified. For this reason, there is not considered to be potential for adverse effects alone or in-combination with other developments within the environs of the Inner Galway Bay SPA and Cregganna Marsh SPA.

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Appendix 5-4

Permitted Development

Planning Reference	Development	Development Address	Decision
Moneyduff, Oranmore			
0069477	Dwelling house and septic tank.	Moneyduff, Oranmore	Granted on 03/02/1994
992433	Permission for 1. the demolition of ruin and outhouse 2. provision of 239 residential units together with associated roadworks, ducting, sewers and watermain on reduced site	Oranhill & Moneyduff, Oranmore	Granted on 20/12/2001
041604	Permission for conversion of existing attic storage to habitable room and for construction of a utility extension to rear of dwellings on house no 1 to 6 inclusive on a previously approved residential development pl ref 01 2846	Moneyduff, Oranmore	Granted on 01/06/2004
081744	Permission to extend dwelling house which is a protected structure Reg. No. 923 and to build a new domestic garage to house camper van (Gross floor area Extension 70.90 sqm Garage 41.40 sqm)	Moneyduff, Oranmore	Granted on 27/11/2008
10112	Permission to demolish existing sub-standard dwellinghouse and garage, and to erect new dwellinghouse, domestic garage and all associated services at 15 Beech Park (gross floor space 161.7sqm house 30.36sqm garage)	Moneyduff, Oranmore	Granted on 29/03/2010
151107	Permission for residential development at Oranhill, Oranmore, Co. Galway. The development contains 68 two storey houses consisting of 48 four bed semi-detached, 4 three bedroom semi-detached, 9 four bedroom detached, 4 three bedroom detached and a terrace of 3 three bedroom houses, together with all associated site works and landscaping. Gross floor space of proposed works: 8,265sqm	Moneyduff/Oranhill, Oranmore	Granted on 01/03/2016
17980	<p>Permission for demolition of an existing dwelling house and construction of a residential development of 38 no. dwelling units (total building area 4,423.4sqm) comprising of 8 no. 4 bedroom semi-detached, 20 no. 3 bedroom semi-detached and 10 no. 3 bedroom terraced with all associated site works and services, previous planning reference no. 09/2055.</p> <p>An Bord Pleanála granted permission following a third party appeal on 22/05/2018 subject to 13 no. conditions. The permission was extended under Pl Ref 17/980. The site is located approximately 130m to the north west of the proposed development.</p>	Moneyduff, Oranmore	Granted on 24/08/2017
Oranhill, Oranmore			
962218	Permission to construct a new dwellinghouse and septic tank.	Oranhill, Oranmore	Granted on 17/02/1997
97894	Permission to construct a dwellinghouse and septic tank.	Oranhill, Oranmore	Granted on 11/11/1997

Planning Reference	Development	Development Address	Decision
99888	Permission to construct a dwellinghouse and septic tank.	Oranhill, Oranmore	Granted on 10/05/1999
001957	Permission to demolish existing dwellinghouse and construct 81 no. dwellinghouses and associated services	Oranhill, Oranmore	Granted on 04/12/2001
023202	Permission for construction of dwelling house & domestic garage	Oranhill, Oranmore	Granted on 10/10/2002
036749	Permission for construction of a dwellinghouse and associated services in place of dwellings granted on sites 16-18 including previously granted approved under pl. ref. no. 00/1957.	Oranhill, Oranmore	Granted on 12/02/2004
041973	Permission to construct 70 no. dwellinghouses & associated services.	Oranhill, Oranmore	Granted on 31/01/2005
04305	Permission for the construction of 89 residential units, a creche and all associated roads and services, incorporating part of the north-south Distributor route as contained in the Oranhill Action Plan. The 89 residential units are comprised as follows: 53 terraced units, 8 apartments, 22 semi detached houses and 6 detached houses.	Oranhill, Oranmore	Granted on 22/11/2004
04322	Permission for construction of a fully serviced dwelling house and domestic garage.	Oranhill, Oranmore	Granted on 03/05/2004
08282	Permission for the construction of a 3-bed dwellinghouse attached to existing dwellinghouse and all associated services.	Oranhill, Oranmore	Granted on 07/07/2008
092113	Permission to construct 70 no. dwellinghouses & associated services.	Oranhill, Oranmore	Granted on 20/01/2010
11407	Permission for construction of a new 244m2 medical centre, 106 child creche, 547m2 of office space, 5 no. retail units totalling 276m2, 5 no. 2 bed townhouses, 10 no. 2 bed apartments, parking for 129 no. cars all in three blocks over a basement along with all ancillary works and services (previous pl. ref. 05/4805)	Oranhill, Oranmore	Granted on 16/05/2011
121233	Extention of duration for permission to construct 70 no. dwellinghouses & associated services, previous planning refernece no. 04/1973 & 09/2113	Oranhill, Oranmore	Granted on 23/11/2012
13638	Permission to demolish existing derelict house and construct two storey residence and associated site development works.	Oranhill, Oranmore	Granted on 08/08/2013
151334	Roykeel Ltd, Brian and Fidelma Loughran for the construction of a residential/commercial development comprised as follows: 1. The completion of the North-South Oranmore distributor road, the route of which was agreed under planning reference 04/305 and for the link of same to the existing roundabout constructed on the N18 for the purpose to serve the North-South distributor road. 2. The modification of part of the development scheme known as 'Coill Clocha'	Oranhill, Oranmore	Granted on 21/12/2015

Planning Reference	Development	Development Address	Decision
	previously approved under pl. ref. 04/305. The site adjoins the proposed development to the east.		
15931	<p>Permission to 1) Construct a residential development consisting of 35 No. dwellings to replace part of a previously permitted development.</p> <p>All proposed development take place on site of a previously approved residential development granted under Planning Reference No. 04/1973 and extensions of duration under reference numbers 09/2113 & 12/1233 which is currently under construction. All proposed dwellings to be accessed of existing estate roads and connected to existing services. 2) Permission is also sought for the setting aside of condition number 15 attached PL. Ref. 04/1973 relating to the provision of a crèche.</p>	Oranhill, Oranmore	Granted on 03/12/2015
1834	Permission to construct a single dwelling over two floors to include new site entrance, connection to existing services and all ancillary works.	Oranhill, Oranmore	Granted on 13/03/2018
1944	<p>Permission for the redevelopment of an existing infill and brownfield site to provide for a mixed-use development comprising of 22 no. residential units and 1 no. commercial unit. Provision for public realm landscaping including shared public open space at ground floor level, carparking spaces, New pedestrian and vehicular access form the Oranhill road with additional pedestrian connectivity to existing estate roads serving Oranhill Avenue and Oranview.</p> <p>Connection to existing public mains water infrastructure, including connection to existing surface water and foul drainage networks, to serve the development, together with all associated site development works and services.</p>	Oranhill, Oranmore	Decision due 12/03/2019. Further information requested.
Renville, Oranmore			
011227	Permission for the construction of 11 no. dwellings and all associated development works.	Renville West, Oranmore	Granted on 05/08/2002
10492	Permission for the demolition of a substandard dwellinghouse and for the construction of a new dwellinghouse, effluent treatment plant and domestic garage (gross floor space 241.5sqm house 60sqm garage)	Renville East, Oranmore	Granted on 25/05/2010
151301	Permission (1) to demolish existing derelict dwelling & sheds (2) erect new dwelling house, domestic garage, waste water treatment system, polishing filter and all	Renville East, Oranmore	Granted on 16/12/2015

Planning Reference	Development	Development Address	Decision
	associated services. Gross floor space of proposed works: 223.30sqm house & 36.50sqm garage		
Cregganna Beg			
11553	Permission for the construction of a two-storey dwelling house, treatment plant and percolation area and all associated works (gross floor space 240.12sqm)(previous pl. ref. 06/256)	Cregganna Beg	Granted on 19/07/2011
11959	Permission for the construction of new one and a half storey private dwelling house, sewerage treatment works, percolation area and all associated site development works (gross floor space 177.4sqm) (previous pl. ref. 06/2211)	Cregganna Beg	Granted on 25/08/2011

Appendix 5-5

Assessment of Plans

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Galway County Development Plan 2015-2021	<p>Policy NHB 1 – Natural Heritage and Biodiversity It is the policy of Galway County Council to support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries and Conamara National Park (and other designated sites including any future designations) and the promotion of the development of a green/ecological network within the plan area, in order to support ecological functioning and connectivity, create opportunities in suitable locations for active and passive recreation and to structure and provide visual relief from the built environment.</p>	<p>The surveys undertaken in the preparation of this application have demonstrated that the proposed Development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC, Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA.</p> <p>There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality. The proposed development has been designed to avoid any effect on surface or ground water outside the site and this is demonstrated within the EIAR</p> <p>There will be no adverse effects in terms of disturbance of SCIs of Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA.</p>
	<p>Objective NHB 1 – Protected Habitats and Species Support the protection of habitats and species listed in the Annexes to and/or covered by the <i>EU Habitats Directive (92/43/EEC) (as amended)</i> and the <i>Birds Directive (2009/147/EC)</i>, and regularly occurring-migratory birds and their habitats and species protected under the <i>Wildlife Acts 1976-2000</i> and the <i>Flora Protection Order</i>.</p>	<p>This has been demonstrated following extensive dedicated surveying of the site for wintering birds and during multidisciplinary walkover surveys. No significant habitat for birds was recorded within or in the vicinity of the development site. The proposed development site is set back 340m from Inner Galway Bay SPA and separated from it by a road, fen and urban infrastructure.</p>
	<p>Objective NHB 2 – Biodiversity and Ecological Networks Support the protection and enhancement of biodiversity and ecological connectivity within the plan area, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, stonewalls, geological and geomorphological systems, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of <i>Article 10</i> of the <i>Habitats Directive</i>.</p>	<p>The re will be no net loss of hedgerow or tree line on the site and a large strip of the western portion of the site has been set aside for semi-natural dry calcareous and neutral grassland management, in addition to other green spaces for local amenity use. The lands are not currently within a formal management regime and are therefore becoming encroached by scrub. Consequently, the current lack of management of the site is likely to result in the long-term deterioration in quality of the calcareous grassland and the further encroachment of scrub through succession. The proposed development commits to the protection of this habitat, where currently no such protection exists.</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
		<p>There will be no deterioration in water quality due to the proposal. All drainage proposals for the development will be consistent with SUDs principles and best practice SUDs drainage design.</p> <p>Storm water drainage design has been designed to cater for all surface water runoff from all hard surfaces in the proposed development including roadways, roofs etc. All stormwater generated on site from roadways and roofs will discharge via Oil/Petrol Interceptor to one of 5 no. proposed soakaways which are situated in the centre and west of the site. The stormwater will soakaway through the soil to groundwater.</p>
Variation No.1 to the County Development Plan 2015 - 2021	<p>Objective DS 6 – Natura 2000 Network and Habitats Directive Assessment</p> <p>Protect European sites that form part of the Natura 2000 network (Including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011(SI No.477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated or subsequent guidance). A plan or project (e.g. proposed development) within the plan area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and/or a Habitats Directive Assessment where necessary, that:</p> <p>a) The plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or</p>	<p>The proposed development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC, Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA.</p> <p>There will be no adverse effects on sensitive aquatic receptors listed as QIs/SCI, as a result of deterioration in water quality.</p> <p>There will be no adverse effects in terms of disturbance of SCIs of Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA as described in relation to NHB 1 above</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<p>b) The plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or</p> <p>c) The plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.</p>	
	<p>Objective DS 10 – Impacts of Developments on Protected Sites Have regard to any impacts of development on or near existing and proposed Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries, Salmonoid Waters, Refuges for Flora and Fauna, Conamara National Park, shellfish waters, freshwater pearl</p>	<p>The proposed development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC, Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA as described above in relation to NHB 1.</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Oranmore Local Area Plan 2012-2022	<p>mussel catchments and any other designated sites including future designations.</p> <p>Policy NH 1 – Natural Heritage, Landscape and Environment</p> <p>It is the policy of Galway County Council, to support the conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of Natura 2000 sites, the protection of Natural Heritage Areas and proposed Natural Heritage Areas and the promotion of the development of a green/ecological network within the Plan Area, in order to support ecological functioning and connectivity, create opportunities in suitable locations for active and passive recreation and to structure and provide visual relief from the built environment. The protection of natural heritage and biodiversity, including Natura 2000 sites, will be implemented in accordance with relevant EU environmental directives and applicable national legislation, policies, plans and guidelines, including the following (and any updated/superseding documents):</p> <ul style="list-style-type: none"> • EU Directives, including the <i>Habitats Directive</i> (92/43/EEC), the <i>Birds Directive</i> (2009/147/EC codified version of Directive), the <i>Environmental Impact Assessment Directive</i> (85/337/EEC), the <i>Water Framework Directive</i> (2000/60/EC) and the <i>Strategic Environmental Assessment Directive</i> (2001/42/EC). • National legislation, including the <i>Wildlife Act 1976</i>, the <i>European Communities (Environmental Impact Assessment) Regulations 1989</i> (SI No. 349 of 1989) (as amended), the <i>Wildlife (Amendment) Act 2000</i>, the <i>European Union (Water Policy) Regulations 2003</i> (as amended), the <i>Planning and Development (Amendment) Act 2010</i> and the <i>European Communities (Birds and Natural Habitats) Regulations 2011</i> (S.I. No. 477 of 2011). • National policy guidelines, including the <i>Landscape and Landscape Assessment Draft Guidelines 2000</i>, the 	<p>The proposed development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC, Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA as described above in relation to NHB 1. .</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<p><i>Environmental Impact Assessment Sub-Threshold Development Guidelines 2003, Strategic Environmental Assessment Guidelines 2004 and the Appropriate Assessment Guidelines 2010.</i></p> <ul style="list-style-type: none"> • Catchment and water resource management plans, including the <i>Western River Basin District Management Plan 2009-2015</i>. • Biodiversity plans and guidelines, including <i>Actions for Biodiversity 2011-2016: Ireland's National Biodiversity Plan</i>, the <i>Biodiversity Action Plan for County Galway 2008-2013</i> and the <i>Biodiversity Guidelines</i> produced by Galway County Council. 	
	<p>Objective NH 1 – Natura 2000 Sites</p> <p>Protect European sites that form part of the Natura 2000 network (including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated/superseding guidance). A plan or project (e.g. proposed development) within the Plan Area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence and a Habitats Directive Assessment where necessary, that:</p> <ol style="list-style-type: none"> 1. The plan or project will not give rise to significant adverse direct, indirect or secondary impacts on the integrity of any Natura 2000 site (either individually or in combination with other plans or projects); or 	

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<p>2. The plan or project will adversely affect the integrity of any Natura 2000 site (that does not host a priority natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or</p> <p>3. The plan or project will adversely affect the integrity of any Natura 2000 site (that hosts a priority natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.</p>	
	<p>Objective NH 2 – Protected Habitats and Species Support the protection of protected habitats and species listed in the annexes to the EU Habitats Directive 1992 (92/43/EEC) and the Birds Directive (2009/147/EC) and regularly occurring-migratory birds</p>	<p>The proposed development will not result in adverse effects on the SCIs and QIs of any European Site as described above in relation to NHB 1. Whilst there will be a loss of hedgerow habitat during the construction phase, this will be replaced so that habitat connectivity is retained. The</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<p>and their habitats, and species protected under the Wildlife Acts. This includes the protection of bats and their roosts, and the maintenance of woodland, hedgerows, treelines, ecological networks and corridors which serve as feeding areas, flight paths and community routes for bats.</p>	<p>tree line to be retained along the western boundary will be enhanced with supplementary planting of native species and the erection of bird and bat boxes throughout the site.</p> <p>There will also be a loss of Annex I calcareous grassland habitat that is fragmented and subject to deterioration through scrub encroachment. This will be mitigated through the ongoing management of an area of grassland within the development to ensure that the habitat is protected within the site, where it is currently offered no protection (in the absence of any planning condition)</p>
	<p>Objective NH 5 – Biodiversity & Ecological Networks Support the protection of biodiversity and ecological connectivity within the Plan area including woodlands, trees, hedgerows, rivers, streams, natural springs, wetlands, stonewalls, fens, salt marshes, geological and geo-morphological systems, other landscape features and associated wildlife, where these form part of the ecological network. Seek to retain and incorporate these natural features into developments, in order to avoid ecological fragmentation and maintain ecological corridors.</p>	<p>A large strip of the western portion of the site has been set aside for semi-natural dry calcareous and neutral grassland management, in addition to other green spaces for local amenity use. The lands are not currently within a formal management regime and are therefore becoming encroached by scrub. Consequently, the current lack of management of the site is likely to result in the long-term deterioration in quality of the calcareous grassland and the further encroachment of scrub through succession.</p> <p>Hedgerows will be retained where possible and enhanced with supplementary planting. The hedgerow to be lost during construction, will be replaced to ensure that ecological networks are maintained</p>
	<p>Objective NH 7 – Wetlands, Springs, Rivers and Streams Seek to preserve the wetlands of Oranmore, identify and protect natural springs, streams/rivers, where possible and ensure that any plans/projects with the potential to adversely affect groundwater, springs, streams or rivers, identify the presence of these features and adequately assess the impacts to them. Protect springs identified on Ordnance Survey mapping or any springs newly identified during project assessment, so that they are not impeded.</p>	<p>There will be no deterioration in water quality due to the proposal. All drainage proposals for the development will be consistent with SUDs principles and best practice SUDs drainage design.</p> <p>Storm water drainage design has been designed to cater for all surface water runoff from all hard surfaces in the proposed development including roadways, roofs etc. All stormwater generated on site from roadways and roofs will discharge via Oil/Petrol Interceptor to one of 5</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
		no. proposed soakaways which are situated in the centre and west of the site. The stormwater will soak away through the soil to groundwater following treatment.
	<p>Objective NH 6 – Water Resources Protect all water resources in the Plan Area, including rivers, streams, springs, surface waters, coastal waters, designated shellfish waters, estuarine waters and groundwater quality, in accordance with the requirements and guidance in the EU Water Framework Directive 2000 (2000/60/EC), the European Union (Water Policy) Regulations 2003 (as amended), the Western River Basin Management Plan 2009-2015, and other relevant EU Directives, including associated national legislation and policy guidance (including any superseding versions of same). Support the application and implementation of a catchment planning and management approach to development and conservation, including the implementation of Sustainable Drainage System techniques for new development in the Plan Area.</p>	The proposed development will not result in any effects on groundwater as no deep excavations are proposed, no drainage is proposed and all discharge to ground will follow appropriate treatment.
	<p>Objective NH 11 – Summer Botanical Survey for Lands at Moneyduff Ensure that a Summer Botanical Survey is undertaken and submitted as part of any planning application for development of lands beside the cSAC/pNHA designated site in Moneyduff. Refer to the Map 2A/2B - <i>Specific Objectives</i>.</p>	Botanical surveys of grassland habitats in Moneyduff were undertaken during August and September 2016 and 2017 respectively. This is within the appropriate period for the undertaking of botanical surveys. ' <i>Best Practice Guidance for Habitat Survey and Mapping</i> ' (Smith <i>et al.</i> , 2011).
	<p>Objective NH 12 – Control of Invasive and Alien Species Seek to prevent and promote measures to prevent the spread of invasive and alien invasive species. Require a landscaping plan to be produced for developments near water bodies and ensure that such plans do not include invasive species.</p>	No invasive species were recorded within the development site during the extensive suite of surveys undertaken.

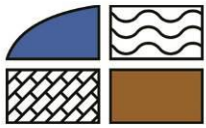
Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<p>Objective NH 13 – Consultation with Environmental Authorities</p> <p>Ensure that all development proposals are screened to determine whether they are likely to have a significant direct, indirect or cumulative effect on the integrity or conservation objectives of any Natura 2000 site and, where significant effects are likely or uncertain, there will be a requirement for consultation with the relevant environmental authorities as part of any Habitats Directive Assessment that may be required.</p>	All relevant ecological and environmental authorities were consulted in the course of preparing this application. Details of all consultation is available in Chapter 2 of the EIAR
The Regional Planning Guidelines for the West 2010-2022	<p>EAP13: To support the protection of Natural Heritage Areas, Special Protection Areas, Special Areas of Conservation, Nature Reserves, Ramsar Sites (Wetlands), Wildfowl Sanctuaries, National Parks, Nature Reserves and the biodiversity designated under the Habitats Directive, Birds Directive, Wildlife Act, Flora Protection Order and other designated or future designated sites.</p>	The proposed development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with the Galway Bay Complex SAC, Inner Galway Bay SPA, Cregganna Marsh SPA and Rahasane Turlough SPA' as described in relation to NHB1 above
	<p>EA018: Support the achievement of favourable conservation status of Annex I habitats, Annex II species, Annex I bird species and other regularly occurring migratory bird species and their habitats in the region.</p>	
National Biodiversity Action Plan 2017-2021	<p>Target 6.2 - Sufficiency, coherence, connectivity, and resilience of the protected areas network substantially enhanced by 2020.</p>	<p>There will be no impact on SCI species of Inner Galway Bay SPA or the QIs of Galway Bay Complex SAC.</p> <p>The proposed development will not impact on connectivity within the wider area. There are no watercourses within the proposed development site that could be used as a commuting corridor.</p> <p>There will be no deterioration in water quality, or impact on fen habitat adjacent to the proposed development site, or wetlands of Inner Galway Bay SPA, due to the proposal.</p>
Draft Galway County Heritage and Biodiversity Plan 2017-2022	<p>Ensure biodiversity and natural heritage are considered at earliest stages in the development of new plans and strategy documents. Promote the integration of biodiversity into work plans and developments at earliest (design) stage of projects.</p>	A dedicated biodiversity management plan has been prepared to ensure that biodiversity within the site is enhanced as much as possible within the scope of the design

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Galway BAP 2014 - 2020	<p>Policy No 9 - Promote creation of new wildlife habitats in developments including housing estates, industrial sites and golf courses.</p> <p>Policy No 13 - promote the retention of hedgerows, recognising their importance as wildlife corridors. Promote the retention of dry-stone walls.</p>	<p>Whilst there will be a loss of hedgerow habitat during the construction phase, this will be replaced so that habitat connectivity is retained. The tree line to be retained along the western boundary will be enhanced with supplementary planting of native species and the erection of bird and bat boxes throughout the site.</p> <p>There will also be a loss of Annex I calcareous grassland habitat that is fragmented and subject to deterioration through scrub encroachment. This will be mitigated through the ongoing management of an area of grassland within the development to ensure that the habitat is protected within the site, where it is currently offered no protection (in the absence of any planning condition)</p>
All Ireland Pollinator Plan	<p>The plan recommends the following pollinator friendly actions:</p> <ul style="list-style-type: none"> • The most important action that can be taken on public land is to reduce the frequency of mowing to allow wildflowers to grow. Where possible, grassy areas should only be mown once or twice annually. They should be cut in early September to allow wild plants to flower and set seed. If doing an early cut, mow in late spring after the first flush of dandelions. Remove grass when cut in order to reduce coarse grasses and increase wildflower diversity. On a wildflower-rich site, where feasible, grass should be turned after cutting to allow seeds to fall. Allow grassy areas to grow and carry out an initial species survey to determine if a seed mix is required. Where appropriate, mow paths through wildflower meadows so that the public can visit and enjoy the resource. • Plant a suite of pollinator friendly trees and shrubs that will flower throughout the pollinator season. 	<p>As outlined in the biodiversity management plan, the set aside grassland habitat will be managed for conservation and will ensure the long-term viability and protection of the semi-natural calcareous grassland habitat within the public open space within the development site. The mowing regime will facilitate botanical diversity, and includes such measures as late mowing, removal of cut grass. Fertilizers and herbicides will not be used. In addition, public access will be promoted by the cutting of grass paths throughout the public open space associated with the development.</p>

Plans	Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
	<ul style="list-style-type: none">• Maintain or create good quality hedgerows	

Appendix 7-1

Flood Risk Assessment



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PROPOSED HOUSING DEVELOPMENT AT MONEYDUFF, ORANMORE, CO. GALWAY

FLOOD RISK ASSESSMENT

FINAL REPORT

Prepared for:
Arlum Ltd

Prepared by:
Hydro-Environmental Services

DOCUMENT INFORMATION


DOCUMENT TITLE:	MONEYDUFF, ORANMORE, CO. GALWAY FLOOD RISK ASSESSMENT
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AUTHOR(S):	MICHAEL GILL BRIAN COFFEY
SIGNED:	 Michael Gill B.A., B.A.I., M.Sc., MIEI Managing Director – Hydro-Environmental Services
<p><u>Disclaimer:</u> This report has been prepared by HES with all reasonable skill, care and diligence within the terms of the reference agreed with the client, and in line with instructions and information provided by the client, and incorporating our terms and conditions and taking account of the resources devoted to it by agreement with the client. The report contains information from sources and data which we believe to be reliable but we have not confirmed that reliability and make no representation as to their accuracy or completeness. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. The flood risk assessment undertaken as part of this study is site-specific and the report findings cannot be applied to other sites outside of the survey area which is defined by the site boundary. This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.</p> <p style="text-align: center;">Copyright © No part of this document may be reproduced without the prior written approval of HES.</p>	

TABLE OF CONTENTS

1. INTRODUCTION.....	5
1.1 BACKGROUND.....	5
1.2 STATEMENT OF EXPERIENCE	5
1.3 REPORT LAYOUT & METHODOLOGY	6
2. BACKGROUND INFORMATION	7
2.1 INTRODUCTION	7
2.2 SITE LOCATION AND TOPOGRAPHY.....	7
2.3 PROPOSED HOUSING DEVELOPMENT DETAILS	7
3. EXISTING ENVIRONMENT AND CATCHMENT CHARACTERISTICS	8
3.1 INTRODUCTION	8
3.2 BASELINE HYDROLOGY.....	8
3.2.1 Regional and Local Hydrology.....	8
3.2.2 Rainfall and Evaporation.....	8
3.3 GEOLOGY.....	9
3.4 DESIGNATED SITES & HABITATS	9
4. SITE-SPECIFIC FLOOD RISK ASSESSMENT.....	10
4.1 INTRODUCTION	10
4.2 FLOOD ZONE MAPPING	10
4.3 FLOOD RISK IDENTIFICATION.....	11
4.3.1 Soils Maps – Fluvial Maps	11
4.3.2 Historical Mapping.....	11
4.3.3 OPW National Flood Hazard Mapping	11
4.3.4 Preliminary Flood Risk Assessment Maps	12
4.3.5 CFRAM Maps – Fluvial and Tidal Flooding.....	13
4.3.6 Oranmore Local Area Plan 2012-2018	14
4.3.7 Irish Coastal Protection Strategy Study (ICPSS)	14
4.3.8 Summary – Flood Risk Identification	15
4.4 INITIAL FLOOD RISK ASSESSMENT	15
4.4.1 Site Survey	15
4.4.2 Hydrological Flood Conceptual Model.....	17
4.4.3 Summary – Initial Flood Risk Assessment	17
4.4.4 Design Flood Levels	17
5. PLANNING POLICY AND JUSTIFICATION TEST.....	19
5.2 ORANMORE LOCAL AREA PLAN (2012-2018)	23
5.3 REQUIREMENT FOR A JUSTIFICATION TEST.....	24
6. REPORT CONCLUSIONS.....	27
6.1 CONCLUSIONS.....	27
7. REFERENCES	29

FIGURES IN TEXT

Figure A: Site Location Map.....	5
Figure B: Local Hydrology Map	8
Figure C: OPW Indicative Floods Map (Source: www.floods.ie)	12
Figure D: PFRA Coastal Flood Zone Mapping (Flood Zones obtained from PFRA Maps no. 210)	13
Figure E: CFRAM Tidal Flood Zone Mapping (Flood Zones obtained from PFRA Maps no. 210)	14
Figure F: Site Drainage Map.....	16

TABLES IN TEXT

Table A: S-P-R Assessment of Flood Sources for the proposed site	17
Table B: Estimate Design Flood Level for the Proposed Development	18
Table C: County Galway Development Plan Objectives/Strategic Aims and Project Responses	19
Table D: County Galway Development Plan Standards/Guidelines and Project Responses	21
Table E: Oranmore Local Area Plan (2012-2018) – Policy on Flood Risk Management	23
Table F: Matrix of Vulnerability versus Flood Zone	24
Table G: Format of Justification Test for Development Management	24

APPENDICES

Appendix I PFRA and CFRAM Maps for the Proposed Development Site	30
Appendix II Oranmore LAP 2012-2019 Mapping	31
Appendix III Site Inspection Photographs 05 th January 2018	32

1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by Arlum Ltd to undertake a Stage II Flood Risk Assessment (FRA) for a proposed housing development at Moneyduff, Oranmore, Co. Galway. A site location map is shown below as **Figure A**.

This FRA is carried out in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (DoEHLG, 2009).



Figure A: Site Location Map

1.2 STATEMENT OF EXPERIENCE

Hydro-Environmental Services ("HES") are a specialist hydrological, hydrogeological and environmental practice which delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core area of expertise and experience is hydrology and hydrogeology, including flooding assessment and surface water modelling. We routinely work on surface water monitoring and modelling and prepare flood risk assessment reports.

Michael Gill is an Environmental Engineer with 17 years environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological assessments for various developments across Ireland. Michael has significant experience in surface water drainage issues, SUDs design, and flood risk assessment.

1.3 REPORT LAYOUT & METHODOLOGY

This FRA report has the following format:

- Section 2 describes the proposed site setting and details of the proposed Development;
- Section 3 outlines the hydrological and geological characteristics of the local surface water catchment in the vicinity of the proposed development site;
- Section 4 deals with a site-specific flood risk assessment (FRA) undertaken for the proposed development which was carried out in accordance with the above-mentioned guidelines;
- Section 5 provides commentary in relation to the Galway County Development Plan and Justification Test;
- Section 6 provides an overview of the environmental impacts on water quality associated with the proposed development; and,
- Section 7 presents the FRA report conclusions.

As stated above this FRA is carried out in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (DoEHLG, 2009). The assessment methodology involves researching and collating flood related information from the following data sources:

- Base maps – Ordnance Survey of Ireland;
- Flood Hazard Maps and flooding information for Ireland, www.floodmaps.ie;
- Office of Public Works (OPW);
- Geological Survey of Ireland (GSI) maps on superficial deposits;
- EPA hydrology maps;
- Preliminary Flood Risk Assessment Maps;
- Catchment Flood Risk Assessment and Management (CFRAM) mapping;
- Galway County Development Plan 2015 – 2021; and,
- Site Walkover (conducted 05th January 2018).

2. BACKGROUND INFORMATION

2.1 INTRODUCTION

This section provides details on the topographical setting of the proposed site along with a description of the proposed development.

2.2 SITE LOCATION AND TOPOGRAPHY

The proposed site is located in the townland of Moneyduff, approximately 590m south of the centre of Oranmore, Co. Galway. The proposed site has an area of ~8.543Ha and is currently uncultivated land with evidence of rough grazing of horses. The proposed site comprises several fields containing stone walls and hedgerows.

The proposed site has an elevation ranging between approximately 3.4 and 12.8m OD (Ordnance Datum). The overall local topography generally slopes from east to west with deposited fill located in mounds around the site creating artificial high points. The dominant land use on the bordering land is residential housing to the north, an environmental reserve to the west and an empty site and further residential uses to the south and greenfield site to the east.

A site location map is shown as **Figure A** above.

2.3 PROPOSED HOUSING DEVELOPMENT DETAILS

The proposed development is residential in nature comprising terraced, semi-detached and fully detached housing along with open green space. We understand the development includes an estate of 212 units (including 34 no. 4-bedroom detached, 54 no. 3-bedroom semi-detached, 10 no. 4-bedroom detached, 16 no. 3-bedroom terrace, 24 no. 3-bedroom semi-detached with attics, 6 no. 4-bedroom detached, 50 no. 2 bedroom duplex, 6 no. 2 bedroom apartments, and 12 no. 2-bedroom apartments), 1 no. crèche (206m²), open space and landscaping, new site entrance, and all associated ancillary services, all on a site of some 8.543Ha.

3. EXISTING ENVIRONMENT AND CATCHMENT CHARACTERISTICS

3.1 INTRODUCTION

This section gives an overview of the hydrological and geological characteristics in the area of the proposed development site.

3.2 BASELINE HYDROLOGY

3.2.1 Regional and Local Hydrology

On a regional scale, the site is located within Hydrometric Area 29 of the Western River Basin District (WRBD). The site is located in the Galway Bay South East catchment and Carrowmoneash (Oranmore)_SC_010 sub-catchment under the Water Framework Directive (WFD).

The Millplot Stream flows west from the land to the west of the proposed site, and continues west, discharging into Oranmore Bay ~295m downstream. The proposed development site does not contain any mapped watercourses.

A local hydrology map of the area which shows the WFD sub-catchment is shown as **Figure B** below. Note that this map represents the extent of the Environmental Protection Agency ("EPA") blueline stream/river network. Our interpretation of the local drainage network is described further in **Section 4.4** below and is slightly different to that shown on this (**Figure B**) map.

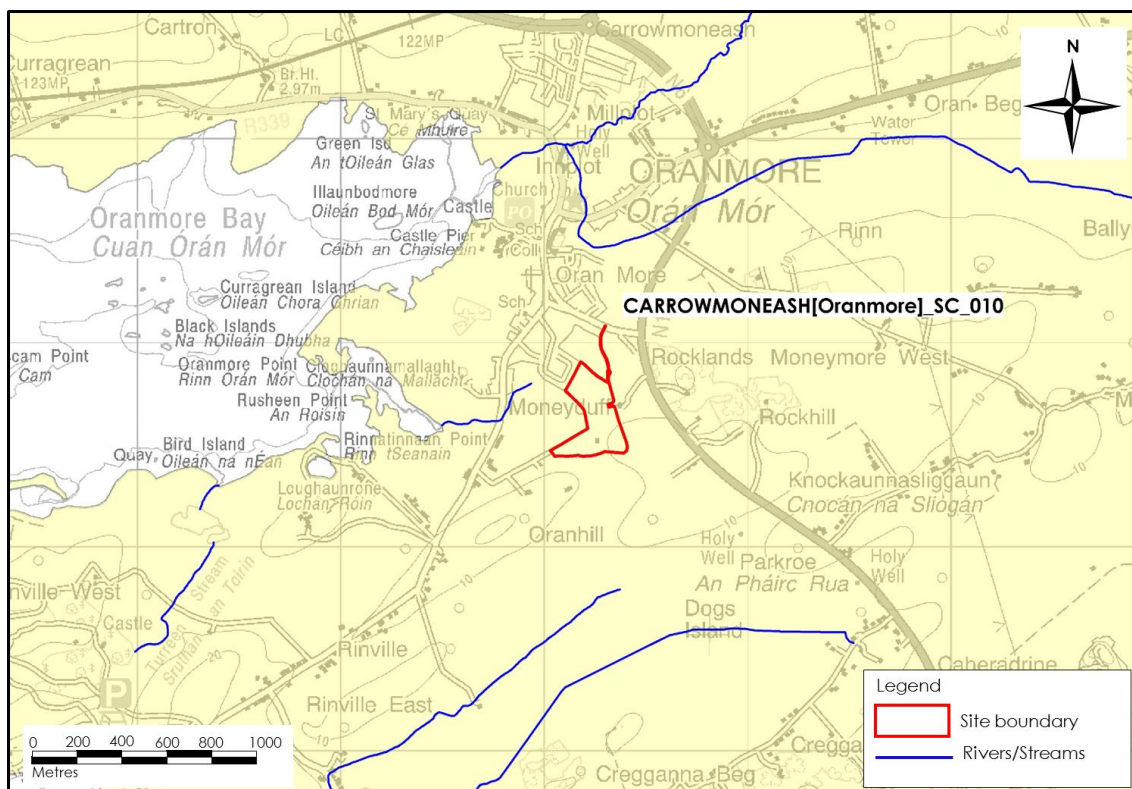


Figure B: Local Hydrology Map

3.2.2 Rainfall and Evaporation

The SAAR (Standard Average Annual Rainfall) recorded at Athenry station, which is located approximately 9.3km to the east of the site, is 1,193mm (www.met.ie). The average potential

evapotranspiration (PE) at Claremorris station is taken to be 408mm (www.met.ie). The actual evapotranspiration (AE) is calculated to be 388mm (95% PE). Using the above figures, the effective rainfall (ER)¹ for the area is calculated to be (ER = SAAR – AE) 805mm.

3.3 GEOLOGY

According to GSI mapping (www.gsi.ie), the site is dominated by shallow, well drained mineral soils (BminSW) and shallow, rocky, peaty mineral complexes (BminSRPT). The area to the west of the proposed site is dominated by peat and some minor areas of the proposed development site in the southwest also contain peat deposits.

The mapped subsoil type (www.gsi.ie) for the proposed site show the majority of the site is underlain by karstified bedrock outcrop/subcrop (KaRck) with some areas of raised peat in the southwest of the site.

The underlying bedrock geology for the entire site is mapped as Dinantian Pure Bedded Limestones (DPBL) and is classified by the GSI as a Regionally Important Aquifer – Karstified (conduit) (Rkc).

There are no mapped faults running through the site and no local mapped karst features within the site that may contribute to groundwater flooding.

3.4 DESIGNATED SITES & HABITATS

Within the Republic of Ireland designated sites includes National Heritage Areas (NHAs), proposed National Heritage Areas (pNHAs), candidate Special Areas of Conservation (cSAC), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).

Lands immediately to the west of the proposed development site are located within the Galway Bay Complex SAC (Code: 000268) and the Millplot Stream flows into the Inner Galway Bay SPA (Code: 004031) approximately 400m downstream of the proposed site.

¹ ER – Effective Rainfall is the excess rainfall after evaporation which produces overland flow and recharge to groundwater.

4. SITE-SPECIFIC FLOOD RISK ASSESSMENT

4.1 INTRODUCTION

The following assessment is carried out in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (DoEHLG, 2009). The basic objectives of these guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and,
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

A stage 1 assessment of flood risk requires an understanding of where the water comes from (i.e. the source), how and where it flows (i.e. the pathways) and the people and assets affected by it (i.e. the receptors). It is necessary to identify whether there may be any flooding or surface water management issues related to the proposed site that may warrant further detailed investigation.

As per the guidance (DOEHLG, 2009), the stages of a flood risk assessment are:

- *Flood risk identification* – identify whether there are surface water flooding issues at a site; and,
- *Initial flood risk assessment* - confirm sources of flooding that may affect a proposed development.

Further to this, a stage 2 assessment involves the confirmation of sources of flooding, appraising the adequacy of existing information and determining what surveys and modelling approach may be required for further assessment.

4.2 FLOOD ZONE MAPPING

Flood zones are geographical areas within which the likelihood of flooding is in a particular range. There are three types or levels of flood zones defined for the purposes of according to OPW guidelines:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and,
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

4.3 FLOOD RISK IDENTIFICATION

4.3.1 Soils Maps – Fluvial Maps

A review of the soil types in the vicinity of the proposed site was undertaken as soils can be a good indicator of past flooding in an area. Due to past flooding of rivers deposits of transported silts/clays referred to as alluvium build up within the flood plain and hence the presence of these soils is a good indicator of potentially flood prone areas.

Based on the EPA/GSI soil map for the area it appears that there are no areas of mineral alluvium soils mapped within the proposed site. Soils maps, however, tend to be generalised and therefore are not definitive, and further analysis is required as outlined below.

4.3.2 Historical Mapping

There is no text on local available historical 6" or 25" mapping for the proposed site that identify areas that are "*prone to flooding*" within the proposed development site boundary.

4.3.3 OPW National Flood Hazard Mapping

The OPW Indicative Flood Maps have no records of recurring flood incidences in the area of the proposed site or immediately downstream of it (**Figure C** below refers). However, these maps are not definite and do not show all flood zone areas.

No areas within the site are mapped as an OPW Drainage District, *i.e.* an area where drainage schemes to improve land for agricultural purposes were constructed or as Benefiting Lands, *i.e.* land identified by the OPW as potentially benefitting from the implementation of Arterial (Major) Drainage Schemes and used as an indicator of land subject to flooding and poor drainage.



Figure C: OPW Indicative Floods Map (Source: www.floods.ie)

4.3.4 Preliminary Flood Risk Assessment Maps

The OPW PFRA map for the area, Map no. 210 (www.cfram.ie/pfra/interactive-mapping/), indicates that there are areas of the proposed site, on the western boundary, within the indicative 200-year coastal flood zone (i.e. Flood Zone A) and 1000-year coastal flood zone (i.e. Flood Zone B). Land to the west of the proposed site is located within the indicative Flood Zone A. The PFRA mapping reflects the close proximity of the site to Oranmore Bay and the fact that the topography of the land between Oranmore Bay and the proposed development site is relatively flat.

No areas within the proposed site are located in the indicative 100-year fluvial or pluvial flood zones (Flood Zone A) or the 1000-year fluvial or pluvial flood zone (Flood Zone B). These flood zones are indicated on the PFRA mapping are shown on **Figure D** below.

Appendix I contains relevant PFRA mapping.

Please note that the PFRA mapping, and the above discussion, is provided for completeness and that the PFRA mapping is superseded by the CFRAM mapping presented below. CFRAM mapping is far more accurate than PFRA mapping.

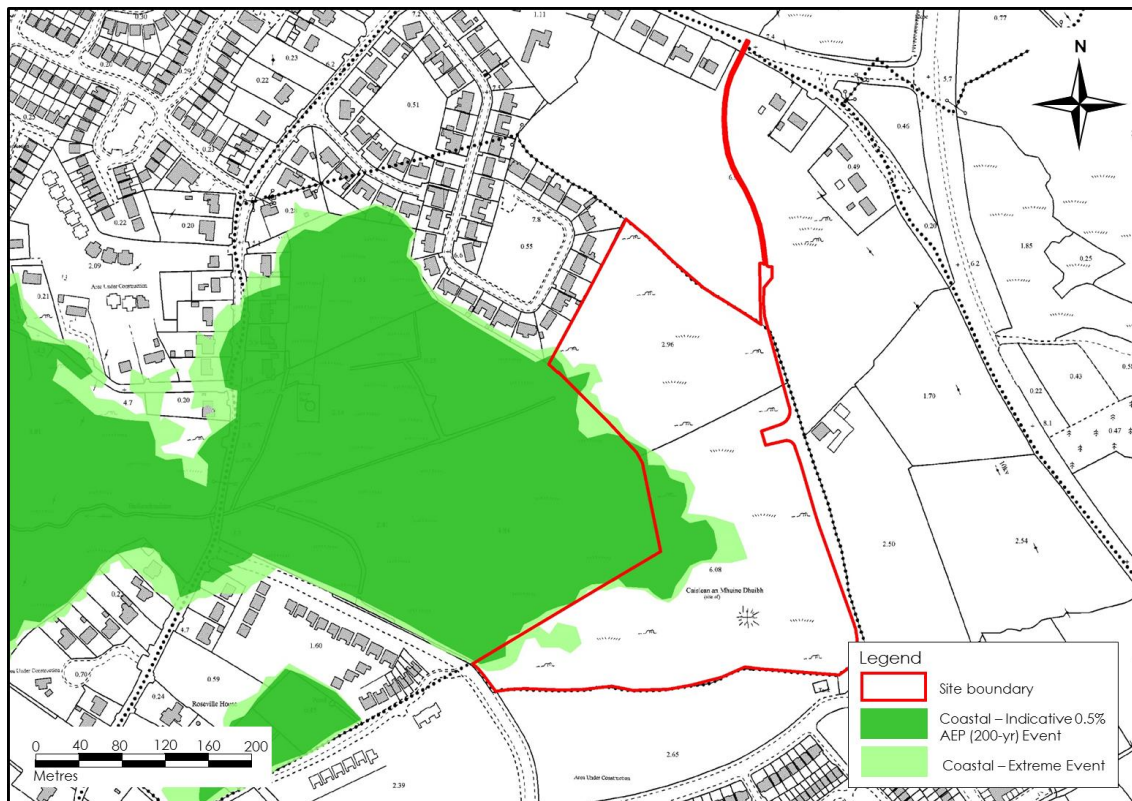


Figure D: PFRA Coastal Flood Zone Mapping (Flood Zones obtained from PFRA Maps no. 210)

4.3.5 CFRAM Maps – Fluvial and Tidal Flooding

Where complete the Catchment Flood Risk Assessment and Management (CFRAM)² OPW Flood Risk Assessment Maps are now the primary reference for flood risk planning in Ireland and supersede the PFRA maps. CFRAM mapping has been completed for the area of the proposed site.

The CFRAM mapping shows that the proposed development site is outside the 10-year Tidal Flood Extent. Large sections of the land to the west of the proposed development site are located within the 10-year Tidal Flood Extent, but owing to higher land within the development site, the flood extent does not encompass this land to the east. Furthermore, no areas within the proposed development site are located in the 200-year flood level (Coastal Flood Zone A) or the 1000-year flood level (Coastal Flood Zone B). As such, the entire proposed development site is located in Flood Zone C. These flood zones are indicated on the CFRAM mapping are shown on **Figure E** below. The CFRAM mapping supersedes the PFRA mapping discussed above.

Appendix I also contains relevant CFRAM mapping for the development site area.

The proposed development site is not affected by fluvial flooding, and this is illustrated on the CFRAM maps attached in **Appendix I**.

² CFRAM is Catchment Flood Risk Assessment and Management. The national CFRAM programme commenced in Ireland in 2011, and is managed by the OPW. The CFRAM Programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland.

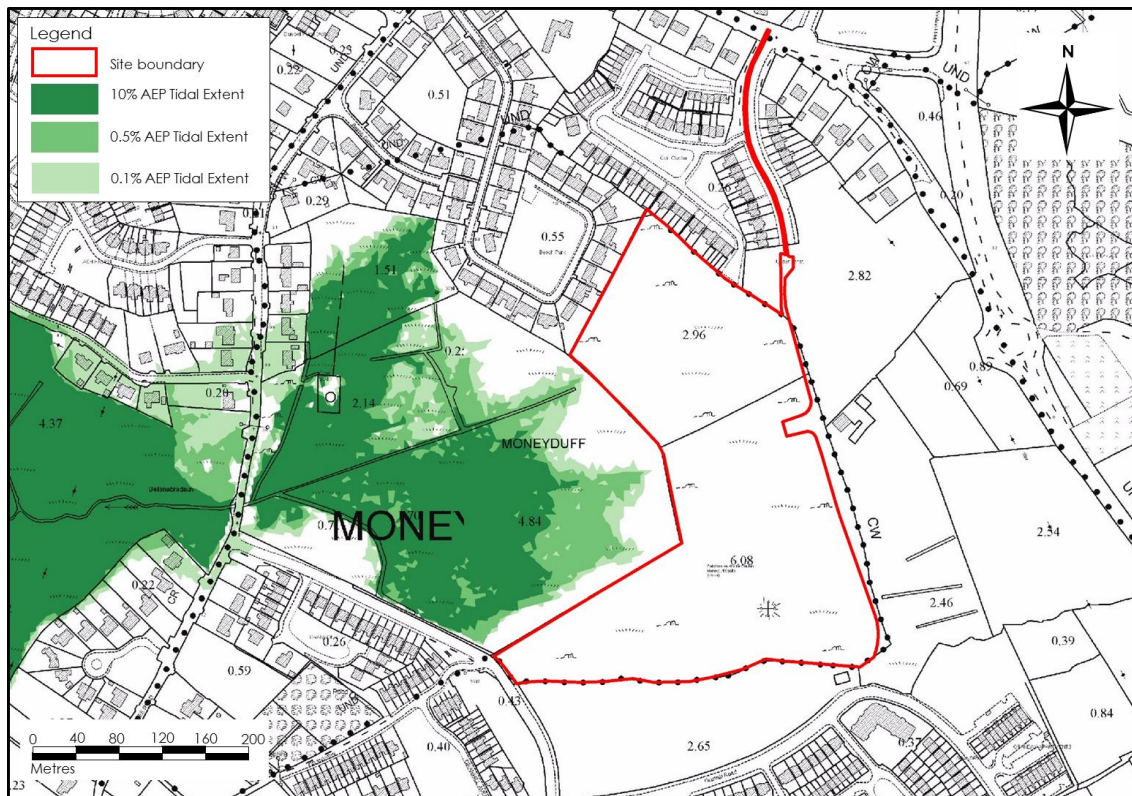


Figure E: CFRAM Tidal Flood Zone Mapping (Flood Zones obtained from PFRA Maps no. 210)

4.3.6 Oranmore Local Area Plan 2012-2018

The Oranmore Local Area Plan 2012-2018 (Oranmore LAP) contains land use zoning boundaries for the proposed development site. The site is divided between a majority of the site as Residential (Phase 1) and, in the west of the site, a narrow band of Open Space / Recreation & Amenity of varying width. Neighbouring land to the west of the site is zoned as Environmental Management (relating to the mapped SAC area).

The Oranmore LAP was adopted in 2012, prior to the completion of the CFRAM mapping for the Oranmore area, i.e. the Western CFRAM Study. As such, it has not been varied to reflect the more accurate flood zones shown in CFRAM mapping.

The extent of the LAP Residential (Phase 1) zoning is closely aligned with the PFRA Coastal Flood Zone (see attached map in **Appendix II**). The Oranmore LAP states that it was guided by the SFRA for County Galway, which used PFRA mapping, in the zoning of lands for various uses. Areas on the western boundary of the proposed development site is zoned as Open Space in accordance with the Flood Risk Management Guidelines which indicate that greenfield / undeveloped lands located within identified flood risk areas should be zoned in this manner.

4.3.7 Irish Coastal Protection Strategy Study (ICPSS)

As part of the Irish Coastal Protection Strategy Study (ICPSS) in 2012, RPS carried out hydraulic modelling of tidal and storm surge flooding along the west coast of Ireland, including Oranmore Bay. The modelling included two future scenarios for flood risk management assessment. The Mid-Range Future Scenario (MRFS) recommends a "likely" future scenario, while the High-End Future Scenario (HEFS) represents a more "extreme" future scenario.

For the MRFS the ICPSS predicted 200-year and 1000-year water levels of 3.81mOD, and 4.06 mOD in Oranmore Bay. If you allow for predicted sea level rise in the MRFS then 500mm

should be added to each of these levels to predict future sea levels, therefore levels increase to 4.31mOD for the 200-year event and 4.56mOD for the 1000-year.

There are inherent uncertainties in the ICPSS modelling, and the ICPSS report indicates a general tolerance of $\pm 0.18\text{m}$.

Please note that the ICPSS assessment (2012) indicates a higher coastal flood level than the newer CFRAM coastal flood maps (2016). However, the CFRAM coastal study uses the ICPSS dataset for setting of boundary conditions for the CFRAM modelling. In order to be conservative, we have used the predicted ICPSS (2012) coastal flood levels in the final design assessment below.

4.3.8 Summary – Flood Risk Identification

Based on the information gained through the flood identification process it would appear that the proposed development site is not constrained by coastal flooding. The entire proposed development site is located in Flood Zone C. Lands to the west are within the 200-year (CFRAM Coastal Flood Zone A) and 1000-year (CFRAM Coastal Flood Zone B) flood zones for these flood mapping sources.

The site visit conducted on 05th January 2018 was necessary to draw conclusions as to the full extent of the coastal flood risk, as suggested by the CFRAM mapping, for the proposed development site. This is discussed further in **Section 4.4** below where a site-specific flood risk assessment was carried out to further assess the risk of potential flooding at the proposed site.

The main risk of flooding at the site is Coastal, as there is no pluvial, groundwater, or fluvial flood risk associated with the site.

4.4 INITIAL FLOOD RISK ASSESSMENT

4.4.1 Site Survey

A detailed walkover survey of the proposed development site and the surrounding area was undertaken by HES on 05th January 2018. The purpose of the site survey was to determine the topographic layout of the proposed site, to investigate the hydrological regime of the area and to determine potential flood patterns and flood zones. An overview of the proposed site drainage is shown on **Figure F** below.

The proposed site was accessed from the field to the west of the proposed development site. The proposed site comprises a series of fields of uncultivated grasses and rush divided by stone walls.

In the field to the west of the proposed development site, the soil was poorly drained and wet underfoot. This field is influenced by the Millplot Stream and artificial drainage channels that cross the western land parcel. The Millplot Stream and field drains all drain to a single culvert under the road on landholding western boundary. All channel banks showed evidence of scoring from machinery shovels suggesting they are actively maintained. There was evidence of seaweed on the banks of the Millplot Stream and a nearby field drain indicating a tidal influence on both. High tides occurred in Galway Bay area in the days preceding the site inspection.

The Millplot Stream enters the western part of the landholding along the northern boundary from a neighbouring construction site. On the day of the site visit, the stream showed adequate capacity to manage flow within its channel. The stream channel is approximately 3m wide and the height varied from 0.7m to 1.2m, with a bank full width of 4-5m.

A possible spring was observed at the location indicated on **Figure F**. This is consistent with the historic 25" OS map that indicates a spring in this part of the site.

The proposed development site is separated from the western, flood-affected land by a natural stone wall. Generally, the fields within the proposed site were better drained and firmer underfoot than the western fields, but still contained some localised waterlogged areas as indicated in **Figure F** below.

Mounds of rock-based fill appear to influence the direction of runoff to some degree in this area of the site, with higher land to the east and lower land to the west. Ultimately the natural topography of the land, underlying this artificial fill, follows the same slope from east to west.

No field drains or channels were observed in the proposed development site and the surrounding residential land on the northern boundary of these fields, and land and road on the southern boundary are significantly higher (~1.3m on northern side and ~2m on southern side) than the proposed development site.

The lower parts of this area, on the eastern side of the stone wall that separates it from the larger western field, is where ponding was observed. These areas of ponding are indicated in **Figure F** below.

In the proposed development site, there are no relevant surface water features. In addition, there was no evidence of tidal influences such as the seaweed debris line seen in the western field. As such, the most relevant source of flooding in this section of the site is pluvial/surface runoff. Site photographs are presented in **Appendix III**.

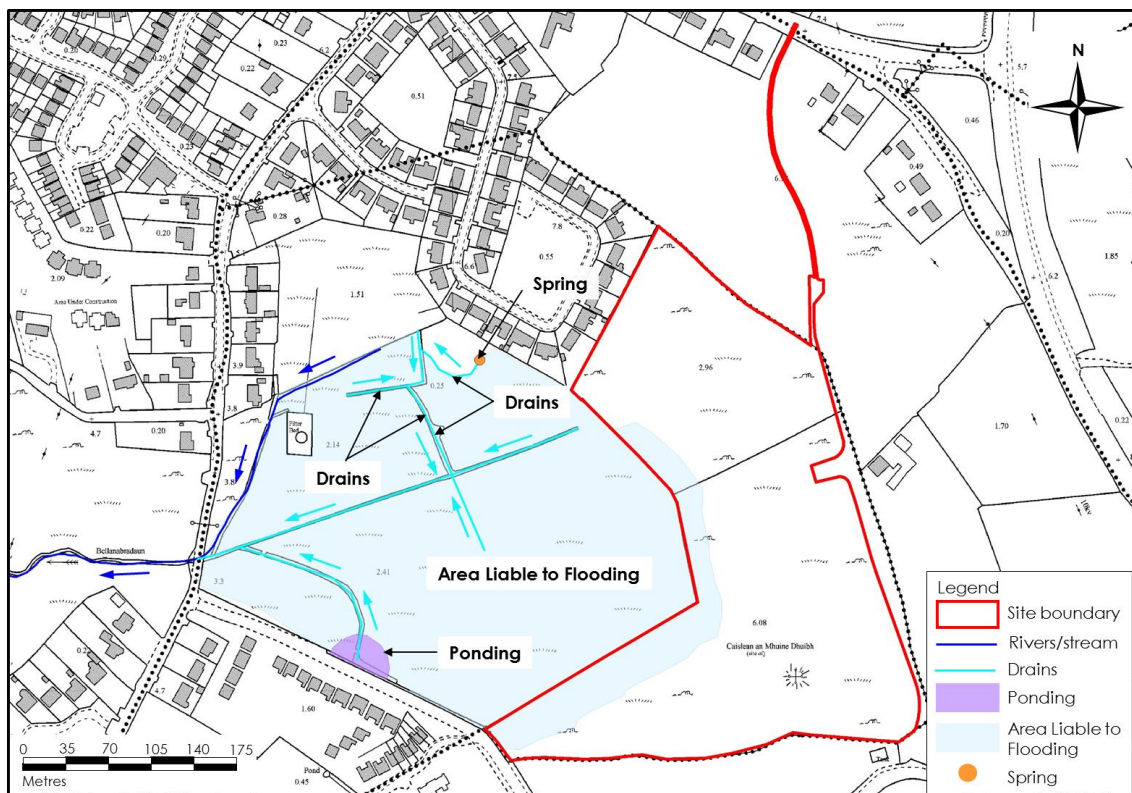


Figure F: Site Drainage Map

4.4.2 Hydrological Flood Conceptual Model

Potential flooding in the vicinity of the proposed site can be described using the Source – Pathway – Receptor Model ("S-P-R"). The primary potential source of flooding in this area, and the one with most consequence for the proposed site, is coastal/tidal from Oranmore Bay. The primary potential pathway would be floodplain inundation due to coastal flooding and storm surge. The potential receptors in the area are land, people, infrastructure and property as outlined below.

4.4.3 Summary – Initial Flood Risk Assessment

Based on the information gained through the flood identification process and Initial Flood Risk Assessment process the sources of flood risk for the proposed site are outlined and assessed in **Table A**.

Table A: S-P-R Assessment of Flood Sources for the proposed site

Source	Pathway	Receptor	Comment
Tidal	Floodplain inundation due to storm surge from Oranmore Bay	Land, People, Infrastructure, Property.	There is an inferred risk of tidal/coastal flooding on the land to the west of the proposed site but not within the proposed development site itself. Nevertheless, the proposed development has been designed to avoid locating residential development housing in the mapped PFRA flood zone areas which reflect the Oranmore LAP Open Space / Recreation & Amenity zoning.
Fluvial	Overbank flooding of the Millplot Stream.	Land, People, Infrastructure, Property.	None of the proposed site is mapped in Fluvial Flood Zone A or Flood Zone B.
Pluvial	Ponding of rainwater on site.	Land, People, Infrastructure, Property.	There is no risk of pluvial flooding as the proposed dwelling locations are outside any areas susceptible to pluvial flooding.
Surface water	Surface ponding/ Overflow.	Land, People, Infrastructure, Property.	Same as above (pluvial).
Groundwater	Rising groundwater levels.	Land, People, Infrastructure, Property.	Based on local hydrogeological regime and PFRA mapping, there is no apparent risk from groundwater flooding.

4.4.4 Design Flood Levels

Following review of all the available data, and further to consultation with OPW regarding CFRAM mapping, the primary factor in determining recommended design floor levels at the site relates to the risk of tidal coastal flooding. All factors outlined above are collated and used to determine recommended minimum floor levels for the proposed development as outlined in **Table B**.

Table B: Estimate Design Flood Level for the Proposed Development

Description	200-year Flood (mOD)	1,000-year Flood (mOD)
Flood Level ¹	3.81	4.06
Allowance for 95% confidence interval ¹	0.18	0.18
Allowance for MRFS Mean Sea Level Rise ²	0.5	0.5
<i>Estimated Flood Level</i>	4.49	4.74
Allowance for MRFS Land Movement ²	0.03	0.03
Freeboard ³	0.3	0.3
<i>Estimated Flood Level + Freeboard</i>	4.82	5.07
Recommended Lowest Floor Level (mOD Malin)	>5.10	

Note 1: Design Flood level, allowance for 95% confidence interval, taken from ICPSS Section 4.1 (already includes storm surge in ICPSS modelling).

Note 2: Allowance for mean sea level rise and land movement taken from Flood Risk Management Climate Change Adaptation Plan (May 2015). Allowance for land movement taken as 0.5mm per year for 60 years, i.e. a typical design life for housing.

5. PLANNING POLICY AND JUSTIFICATION TEST

5.1 PLANNING POLICY AND THE GALWAY COUNTY DEVELOPMENT PLAN

The following objectives (**Table C**) and standards (**Table D**) are defined in County Galway Development Plan (CGDP) 2015-2021 in respect of flooding, and we have outlined in the column to the right how these policies are provided for within the proposed development design.

Table C: County Galway Development Plan Objectives/Strategic Aims and Project Responses

No.	Objectives/Strategic Aims	Development Design Response
DS 8	Climate Change Galway County Council shall support the <i>National Climate Change Strategy</i> and follow on document <i>National Climate Change Adaptation Framework Building Resilience to Climate Change 2012</i> , on an ongoing basis through implementation of supporting objectives in this plan, particularly those supporting the use of alternative and renewable energy sources, sustainable transport, air quality, biodiversity, green infrastructure, coastal zone management, flooding and soil erosion.	The proposed development is consistent with this climate change policy framework.
SA 11	Climate Change Adaptation Engage in efforts to limit the human induced causes of climate change and take account of climate change in planning and delivering work programmes. Engage in efforts to mitigate and adapt to climate change and integrate climate change considerations in planning and delivering work programmes. Performance indications for this aim: <ul style="list-style-type: none"> • Increase / decrease in energy efficiency, (if statistics available); • Expansion of renewable energy generating sector; • Occurrence of flood damage. 	The proposed development design has used PFRA and CFRAM flood extents to identify and avoid vulnerable development in areas at risk of flood damage.
FL 1	Flood Risk Management and Assessment Comply with the requirements of the DoEHLG/OPW "The Planning System and Flood Risk Management – Guidelines for Planning Authorities" and its accompanying "Technical Appendices Document 2009" (including any updated/superseding documents). This will include the following: (a) Avoid, reduce and/or mitigate, as appropriate in accordance with the Guidelines; (b) Development proposals in areas where there is an identified or potential risk of flooding or that could give rise to a risk of flooding elsewhere will be required to carry out a Site-Specific Flood Risk Assessment, and justification test where appropriate, in accordance with the provisions of "The Planning System and Flood Risk Management Guidelines 2009" (or any superseding document); (c) Development that would be subject to an inappropriate risk of flooding or that would cause or exacerbate such a risk at other	This site-specific FRA is consistent with the DoEHLG/OPW guidelines and its accompanying technical appendix.

	locations shall not normally be permitted; (d) Galway County Council shall work with other bodies and organisations, as appropriate, to help protect critical infrastructure, including water and wastewater, within the County, from risk of flooding.	
FL 2	<p>Surface Water Drainage and Sustainable Drainage Systems (SuDs)</p> <p>Maintain and enhance, as appropriate, the existing surface water drainage system in the County. Ensure that new developments are adequately serviced with surface water drainage infrastructure and promote the use of Sustainable Drainage Systems in all new developments. Surface water run-off from development sites will be limited to pre-development levels and planning applications for new developments will be required to provide details of surface water drainage and sustainable drainage systems proposals.</p>	<p>All drainage proposals for the development will be consistent with SuDs principles and best practice SuDs drainage design.</p> <p>HES have reviewed the Tobins (Civils Works Planning Stage – Rev A Report), and confirm storm water drainage design has been designed to cater for all surface water runoff from all hard surfaces in the proposed development including roadways, roofs etc. All stormwater generated on site from roadways and roofs will discharge via Oil/Petrol Interceptor to one of 5 no. proposed soakaways which are situated in the centre and west of the site. The stormwater will soakaway through the soil to groundwater.</p>
FL 3	<p>Protection of Waterbodies and Watercourses</p> <p>Protect waterbodies and watercourses within the County from inappropriate development, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains. This will include protection buffers in riverine, wetland and coastal areas as appropriate.</p>	Potential environmental impacts to waterbodies and watercourses as a result of the proposed development are assessed in the EIAR Chapter on Water.
FL 4	<p>Flood Risk Assessment for Planning Applications and CFRAMS</p> <p>Site-specific Flood Risk Assessment (FRA) is required for all planning applications in areas at risk of flooding, even for developments appropriate to the particular flood zone. The detail of these site-specific FRAs will depend on the level of risk and scale of development. A detailed site-specific FRA should quantify the risks, the effects of selected mitigation and the management of any residual risks.</p> <p>The Council shall have regard to the results of any CFRAM Studies in the assessment of planning applications.</p>	<p>This site-specific FRA for the proposed development is appropriate to the scale of development and the flood risk to the site.</p> <p>CFRAM mapping is available for the proposed development site and is discussed in section 4.3.5 above.</p> <p>The tidal flood extent shown in CFRAM mapping is reduced in area relative to the PFRA flood extents. This is a result of the higher accuracy of the CFRAM Study. However, the land use zoning for the proposed development site as outlined in the Oranmore LAP, relies on the PFRA mapping. Adopting a conservative approach to flood risk, and aligning with the Oranmore LAP, the proposed development is designed to limit its residential component to those areas outside the PRFA mapping.</p>
FL 5	<p>SFRA/FRA and Climate Change</p> <p>SFRAs and site-specific FRAs shall provide information on the implications of climate</p>	The Western CFRAM Study provided for the expected impacts of climate change based on the 2009 OPW

	change with regard to flood risk in relevant locations. The 2009 OPW Draft Guidance on "Assessment of Potential Future Scenarios for Flood Risk Management" (or any superseding document) shall be consulted with to this effect.	Draft Guidance ³ . The results of the Western CFRAM Study are an integral part of this site-specific FRA and as such the recommendations of this report include provisions for the implications of climate change. Additional factors for predicted sea level rise, and tolerances in previous studies have also been assessed and addressed in this FRA report.
FL 6	FRA and Environmental Impact Assessment (EIA) Flood risk may constitute a significant environmental effect of a development proposal that in certain circumstances may trigger a sub-threshold EIS. FRA should therefore be an integral part of any EIA undertaken for projects within the County.	This site-specific FRA reflects the flood risk of the proposed development in accordance with the DoEHLG/OPW Guidelines "The Planning System and Flood Risk Management – Guidelines for Planning Authorities".

Chapter 13 of the CGDP lists a number of development management standards and guidelines. These standards and guidelines are intended to supplement the policies and objectives of the CGDP, including the objectives from *Chapter 12: Flood Risk Management* that are listed above. Development management Standard 27: *Surface Water Drainage and Flooding* contains details of the requirements with regard to flood prevention and management that new developments will be subject to.

Table D: County Galway Development Plan Standards/Guidelines and Project Responses

No.	Objectives	Development Design Response
27a	Surface Water Drainage Drainage from paved surfaces may, after suitable treatment, be discharged to available watercourses or to adequate soakage areas on site. In any event, surface water shall not be permitted to flow on to the public road from any proposed development. Accesses and road frontage should be designed in such a manner as to deal with surface water and ensure that it does not impact on the public road. For rural houses, existing roadside drainage shall be maintained by the incorporation of a suitably sized drainage pipe. Each application shall be accompanied by design calculations or appropriate evidence to support the size of the pipe selected.	The proposed development will ensure that surface water drainage is undertaken in accordance with this objective. The use of drainage features such as soakaways of sufficient capacity within the access road footprint will ensure no runoff to the public road from the construction or operation of the proposed development. Please refer to Tobins Report (Civils Works Planning Stage – Rev A).
27b	Surface Water Runoff Land uses shall not give rise to increases in the run-off characteristics above those that currently exist.	The proposed project infrastructure will be designed in a manner that mitigates the increase in the impervious surface of the site as a result of the project. To mitigate against any very minor potential increased runoff, a site-specific drainage system will be used to ensure that runoff is contained and attenuated within the proposed site. All drainage discharge from the development site is proposed to discharge via soakaways. Please refer to Tobins Report (Civils Works

³ See Section 11 of Western CFRAM Unit of management 29 – Galway Bay South East Hydrology Report (OPW, 2014)

		Planning Stage – Rev A).
27c	<p>Sustainable Drainage Systems</p> <p>The use of Sustainable Drainage Systems (SuDs) shall be encouraged in new developments to minimise the risk of flooding and contamination and to protect environmental and water resources. The Council will seek to ensure applicants incorporate sustainable drainage systems for significant developments in both urban and rural areas and will encourage them for other developments.</p> <p>SuDS is an approach that seeks to manage the water as close as possible to its origin by various engineering solutions that replicate natural drainage processes, before it enters the watercourse. The incorporation of SuDS techniques allows surface water to be either infiltrated or conveyed more slowly to water courses using porous surface treatments, ponds, swales, filter drains or other installations. SuDS should be designed to be cost-effective and require minimum maintenance.</p>	<p>All drainage proposals for the site are consistent with SuDs principles and will be designed in line with best practice SuDs drainage design.</p> <p>Through the implementation of SuDs principles, the surface water runoff rates from the developed site will be the same as that of the current greenfield site. All development drainage will discharge to ground via soakaways.</p> <p>Please refer to Tobins Report (Civils Works Planning Stage – Rev A).</p>
27d	<p>Flooding</p> <p>Development should not itself be subject to an inappropriate amount of flooding or exacerbate the risk of flooding at other locations. Development must so far as is reasonably practicable incorporate the maximum provision to reduce the rate and quantity of run-off. In particular, where appropriate:</p> <ul style="list-style-type: none"> • Hard surface areas (car parks. etc.) should be constructed in permeable or semi-permeable materials; • On site storm water ponds to store and/or attenuate additional run-off from the development, should be provided. 	<p>The proposed development incorporates provisions to reduce the rate and quantity of run-off to the greatest extent practicable on the site.</p> <p>As mentioned above, all drainage proposals for the site are consistent with SuDs principles and will be designed in line with best practice SuDs drainage design.</p> <p>Please refer to Tobins Report (Civils Works Planning Stage – Rev A).</p>
27e	<p>Flood Risk Assessment</p> <p>Where flood risk may be an issue for any proposed development, a flood risk assessment should be carried out that is appropriate to the scale and nature of the development and the risks arising. This shall be undertaken in accordance with the DoEHLG "Flood Risk Assessment Guidelines 2009" (or any superseding document). Applicants are requested to refer to the OPW National Flood Hazard Mapping Website, to the County Stage 1 Strategic Flood Risk Assessment undertaken for the County Development Plan and Stage 2 Strategic Flood Risk Assessments undertaken for recently adopted and/or amended Local Area Plans where appropriate prior to submitting proposals for development.</p>	<p>This FRA is consistent with this development management standard.</p> <p>The County Stage 1 Strategic Flood Risk Assessment (SFRA) is based on PFRA mapping which as stated in the SFRA is "only a preliminary assessment". After the Galway CDP came into effect, CFRAM mapping became available for the Oranmore area. As per Section 1.4 of Appendix A of the DoEHLG "Flood Risk Assessment Guidelines 2009", CFRAM flood maps supersede PFRA maps and thus were used in this FRA report.</p> <p>A Stage 2 SFRA has not been undertaken for Oranmore to date.</p>
27f	<p>Floodplains</p> <p>Appropriately designed development that is not sensitive to the effects of flooding may be permissible in floodplains, provided it does not reduce the floodplain area or otherwise restrict flow across floodplains. Examples of such development might include park areas, sports pitches, certain types of industry warehousing, etc. designed to be flood resistant and/or sensitive. Such developments should only be permitted</p>	<p>The proposed development is considered acceptable. This FRA is used to advise on the appropriate location of project infrastructure given the flood risk on site. The site layout reflects this process, with amenity open space areas in Flood Zone A, and the residential dwellings located in Flood Zone C. Some minor</p>

	provided it incorporates adequate measures to cope with the over-existent flood risk, for example, adequate drainage systems, safety measures, emergency response facilities and/or warning and response systems, and where it is considered that flooding would not result in significant hardship/financial loss or cost.	infilling works is likely to be required to achieve same.
27g	<p>Watercourses</p> <p>For developments adjacent to all watercourses of a significant conveyance capacity or where it is necessary to maintain the ecological or environmental quality of the watercourse, any structures (including hard landscaping) must be set back from the edge of the watercourse to allow access for channel clearing/maintenance/vegetation. A minimum setback of 5-10m is required either side depending on the width of the watercourse.</p> <p>Development consisting of the construction of embankments, wide bridge piers or similar structures will not normally be permitted in or across floodplains or river channels, as these structures restrict/obstruct flow and increase the risk of flooding to property and land upstream. It is considered necessary in exceptional cases to permit such structures, however they should be designed to minimise and/or compensate for any potential negative effects.</p>	<p>The proposed development is located a significant distance from the Millplot Stream in the field to the west of the site.</p> <p>The proposed development does not include the construction of embankments, wide bridge piers or other structures that would affect the flow or increase the risk of flooding.</p>
27h	<p>Flood Design Standards</p> <p>All new development must be designed and constructed to meet the following minimum flood design standards:</p> <ul style="list-style-type: none"> • For urban/built up areas or where developments (existing, proposed or anticipated) are involved – the 100 year flood; • For rural areas or where further developments (existing, proposed or anticipated) are not involved – the 25 year flood; • Along the coast and estuaries – the 200 year tide level; • Where streams, open drains or other watercourses are being culverted - the minimum permissible culvert diameter is 900mm (access should be provided for maintenance as appropriate). 	The proposed development will comply with this development management standard.

5.2 ORANMORE LOCAL AREA PLAN (2012-2018)

Section 3.6 of the 2012-2018 Oranmore Local Area Plan addresses flood risk management and required assessments. The key policy relating to flood risk is similar to that outlined above from the CDP. Policy U14 is shown in **Table E**.

Table E: Oranmore Local Area Plan (2012-2018) – Policy on Flood Risk Management

No.	Policy	Development Design Response
U14	<p>Policy U14 – Flood Risk Management</p> <p>It is the policy of Galway County Council to support, in co-operation with the OPW, the implementation of the EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No. 122 of 2010) and the DoEHLG/OPW publication The Planning System and Flood Risk Management Guidelines for Planning Authorities 2009 (or any updated/superseding legislation or policy guidance). Galway County Council will also take account of the OPW Catchment Flood Risk</p>	<p>This site-specific FRA is consistent with the DoEHLG/OPW guidelines, the Floods Directive, and PFRA and CFRAM mapping for the area.</p> <p>Additional factors for predicted sea level rise have also been addressed in this report.</p>

	Management Plans (CFRAMs), Preliminary Flood Risk Assessment (PFRA) and the Strategic Flood Risk Assessment for County Galway 2012 and any recommendations and outputs arising from same that relate to or impact on the Plan Area.	
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The Flood Risk Management policy for the area is defined on Figure 3A of the LAP. However, this mapping is based on PFRA mapping as described in **Section 4.3.4** above.

5.3 REQUIREMENT FOR A JUSTIFICATION TEST

The matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test⁴ is shown in **Table F** below.

The majority of the proposed site area, including all dwelling locations, is located in Flood Zone C, and all house floor levels are recommended to be built >5.10mOD Malin. It may be considered that the proposed activity is a combination of 'Highly Vulnerable Development – Dwelling' and 'Water Compatible Development – Amenity open space'. Under the proposed location footprint of the development, all 'highly vulnerable' infrastructure, i.e. housing, and 'water compatible' development, i.e. open space, is to be located in Flood Zone C. There may be some minor requirement to raise ground levels in PFRA Flood Zone A and B, and as such a Justification Test⁵ is required, and is outlined below. Also, 3 small areas of proposed road will be located at an elevation of 5.0 mOD. These areas are located at the extremities of the developments, and as such inundation will not affect emergency services access in the event of a significant flood. This issue is discussed further below.

Table F: Matrix of Vulnerability versus Flood Zone

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	<u>Justification test</u>	<u>Justification test</u>	<u>Appropriate</u>
Less vulnerable development	Justification test	Appropriate	Appropriate
Water Compatible development	Appropriate	Appropriate	<u>Appropriate</u>

Note: Taken from Table 3.2 (DoEHLG, 2009)

Bold: Applies to this project.

Box 5.1 of "The Planning System and Flood Risk Management Guidelines" (PSFRM Guidelines) outlines the criteria required to complete the "Justification Test".

Table G: Format of Justification Test for Development Management

Box 5.1 Justification Test for Development Management (to be submitted by the applicant)
<p>When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:</p> <ol style="list-style-type: none"> 1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking

⁴ A 'Justification Test' is an assessment process designed to rigorously assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk, (DoEHLG, 2009).

⁵ A 'Justification Test' is an assessment process designed to rigorously assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk, (DoEHLG, 2009).

account of these Guidelines.

2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
 - i. The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
 - ii. The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
 - iii. The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
 - iv. The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: this table has been adapted from Box 5.1 of "The Planning System and Flood Risk Management Guidelines", (2009).

Referring to Point 1 and Points 2 (i) to (iv) inclusive:

1. The Oranmore LAP (2012-2018) has zoned the site into two land uses, Residential and Open Space / Recreation & Amenity, as shown in **Appendix II**. The Environmental Management zone to the west of the site is a reflection of the SAC designation at this location. The narrow Open Space / Recreation & Amenity zone in the west of the proposed development site is aligned with the PFRA mapping indicative flood zones and reflects the GCC desire to have this area preserved in an undeveloped state under the current Oranmore LAP. The Residential (Phase 1) zoning for the remaining eastern section of the site is land that has been phased for residential development within the lifetime of the Oranmore LAP, i.e. these lands are allocated for residential development up to 2018. As such, the residential component of the proposed development, limited to the area zoned as Residential (Phase 1) is in accordance with the sequential and phased residential development sought by GCC under the Galway CDP.
2. The proposal for the Oranmore development site has been the subject of a flood risk assessment (this report) and this assessment has shown that:
 - i. The development is predicted to have an imperceptible impact on flood risk elsewhere in the locality.
 - ii. The proposed development is not predicted to impede the flow of tidal water during flood events. It is therefore estimated that the development presents minimal risk to people, property, the economy and the environment.
 - iii. Residual risks to the area and to the proposed development during a tidal/coastal flood event can be managed. A drainage system will be installed as part of the development to control runoff in line with GDSDS requirements, and this will prevent any potential knock-on flooding or water quality impacts downstream. This drainage system will ensure that displacement of flood water due to infill works will be compensated elsewhere within the site. It is proposed that housing floor levels within the development will be designed above the 1000-year MRFS flood level (i.e. >5.10mOD). In addition, apart from 3 small local areas, all internal roads are designed above the 5.1mOD level. The 3 small areas are at the extremities of the development site, and road levels will be at 5.0mOD, just 100mm below the predicted extreme flood level. If this level was reached, emergency service vehicles would still be able to access all parts of the development, given that the flood depth would only be 100mm above the road level. Access to the site during an emergency scenario will be possible via the N67 road and Coill Clocha residential development to the east of the proposed development site. The wastewater pumping station located at the site is a

- sealed underground tank and will therefore not be affected by any potential infrequent tidal flooding.
- iv. The proposed development is compatible with the wider planning objectives of the area.

6. REPORT CONCLUSIONS

6.1 CONCLUSIONS

- A flood risk identification study was conducted to identify potential flood risks associated with the proposed residential development in Moneyduff, Co. Galway. From this study:
 - No instances of historical flooding were identified in historic OS maps;
 - No instances of recurring flooding were identified on OPW maps within the proposed development site; and
 - Areas of the proposed site were identified within the PFRA and CFRAM Flood Zones as described below.
- Potential for coastal flooding is the key flood risk issue at the proposed development site;
- The PFRA mapping indicates that there is a small area in the west of the proposed site located in the coastal Flood Zone A (200-year flood zone) and the coastal Flood Zone B (1000-year flood zone). The remainder of the proposed site is located in Flood Zone C – where the probability of flooding is low (less than 0.1% or 1 in 1,000);
- From the site survey conducted, there appears to be depressions in the west of the site that are prone to pluvial flooding. These depressions are earmarked for open space as opposed to residential development for the proposed project;
- The CFRAM mapping indicates that there are no areas within the site that are within the Coastal Flood Zone A and B. The extent of Coastal flood zones ends in the centre of the field to the west of the site;
- The site infrastructure and housing layout has been designed to ensure all highly vulnerable infrastructure are located outside the mapped PFRA flood zones. This ensures development located in mapped PFRA flood zones are limited to water compatible development *i.e.* amenity open space. The development of the site layout was interactive and was completed in line with recommendations included in “The Planning System and Flood Risk Management – Guidelines for Planning Authorities – Technical Appendices (Nov, 2009) – Appendix B;
- With the application of standard best practice SuDS drainage controls (soakaways) within the proposed site no downstream flooding from storm water runoff resulting from the proposed development is anticipated;
- Minimum floor levels within the proposed development are set above >5.10mOD, and for recommended floor levels this includes for tolerances in completed PFRA, CFRAM/ICPSS modelling, and predicted sea level rise due to climate change, and also includes an additional freeboard of 0.3m. This is a critical point as the development design includes a conservative tolerance for several climate change factors affecting coastal flooding in Galway, and therefore includes for predicted sea level variations over the intended lifetime of the proposed development;
- Notwithstanding the 0.3m freeboard, there are 3 small localised areas of internal roads that are designed at 5.0mOD. These areas are considered acceptable, as they will only potentially flood to a depth of 100mm, and this will not affect the ability to access any part of the site by emergency services during an extreme coastal flood event;
- As outlined in Section 5.1 above, the proposed development is consistent with the relevant planning objectives and standards from the County Galway Development Plan 2015-2021; and,

- Based on the above, the overall risk of flooding posed by the proposed residential development and downstream of the site is estimated to be low.

* * * * *

7. REFERENCES

AGMET	1996	Agroclimatic Atlas of Ireland.
DOEHLG	2009	The Planning System and Flood Risk Management Guidelines for Planning Authorities.
Met Eireann	1996	Monthly and Annual Averages of Rainfall for Ireland 1961-1990.
GDSDS	2005	Greater Dublin Strategic Drainage Study (http://www.greaterdublindrainage.com/gdsds/)
CFRAM	2016	Coastal Flood Map No. W29ORM_EXCCD_F2_02 (Western CFRAM Study)
OPW	2011	Preliminary Flood Risk Assessment Maps (PFRA Map no. 210)
Galway County Council	2012	Oranmore Local Area Plan 2012-2018
Office of Public Works	2012	Irish Coastal Protection Strategy Study – Phase 4 – West Coast
Office of Public Works	2015	Draft Climate Change Sectoral Adaptation Plan Flood Risk Management (May 2015).
Galway County Council	2015	Galway County Development Plan (CDP) 2015-2021

APPENDIX I PFRA AND CFRAM MAPS FOR THE PROPOSED DEVELOPMENT SITE

Flood Extents

Fluvial - Indicative 1% AEP (100-yr) Event

Coastal - Indicative 0.5% AEP (200-yr) Event

Pluvial - Indicative 1% AEP (100-yr) Event

Groundwater Flood Extents

PFRA Outcomes

*** Possible Area for Further Assessment**

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

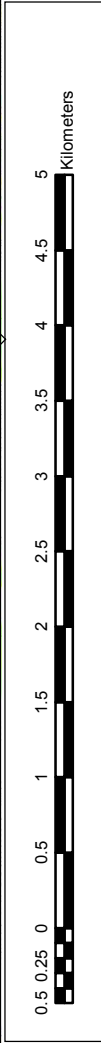
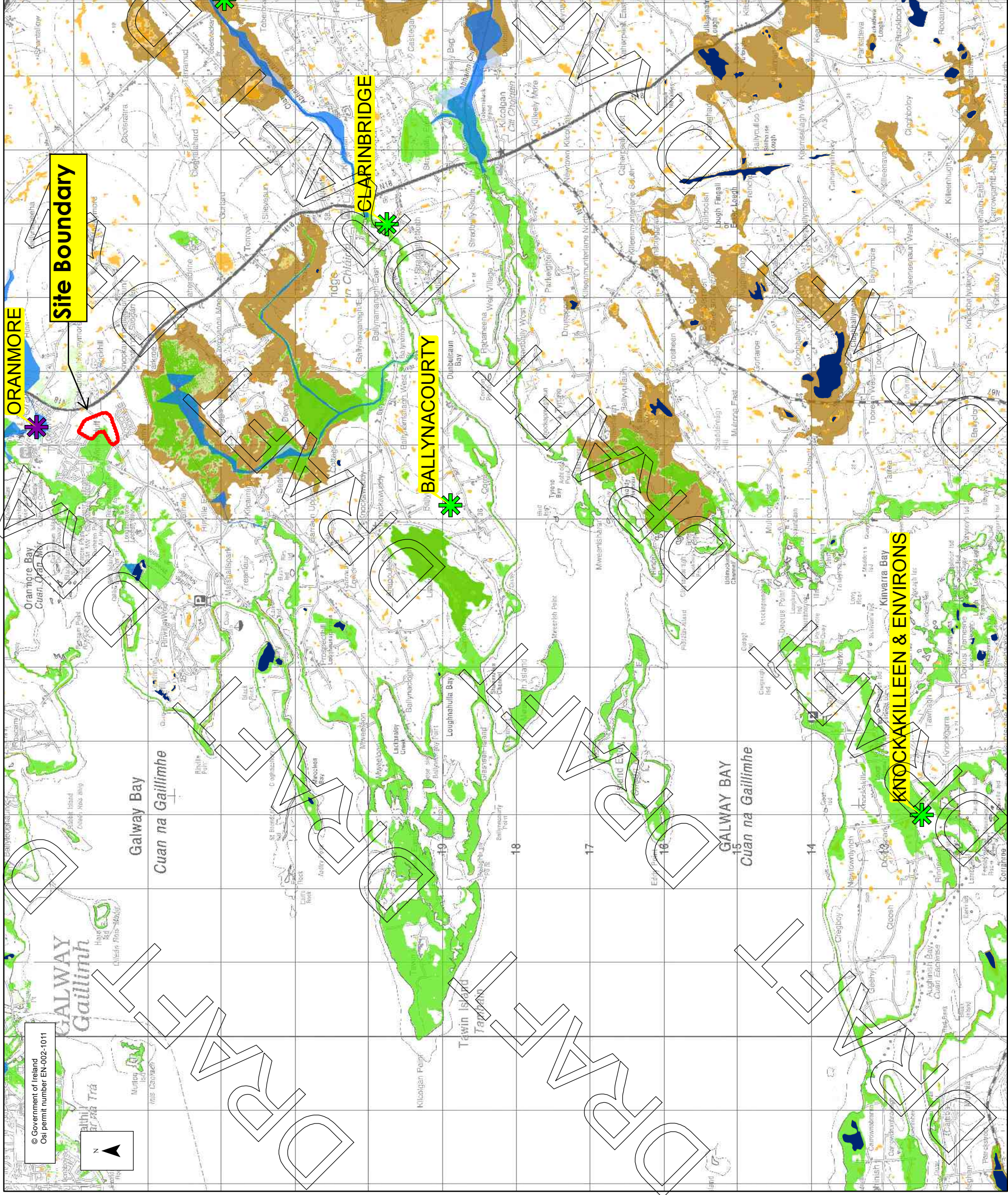
Office of Public Works
Jonathon Swift Street
Trim
Co Meath

PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

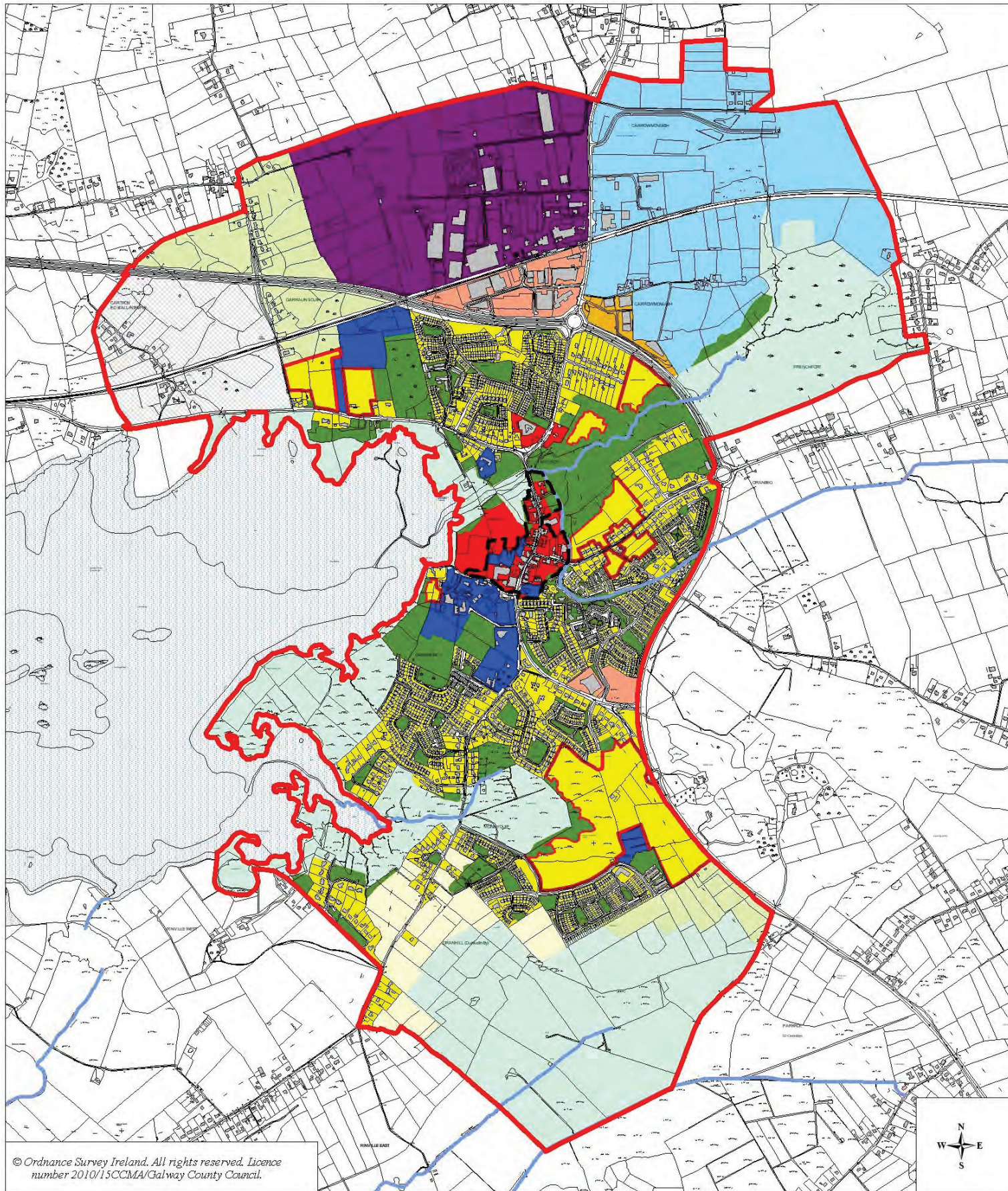
Figure By: PJW Date: July2011

Figure No. : | Revision

Drawing Scale : 1:50,000



APPENDIX II ORANMORE LAP 2012-2019 MAPPING



LEGEND

	Local Area Plan Boundary		BE - Business & Enterprise		SR - Strategic Reserve
	R - Residential Existing		I - Industrial		TI - Transport Infrastructure
	R - Residential (Phase 1)		CF - Community Facilities		Rivers / Streams
	R - Residential (Phase 2)		OS - Open Space / Recreation & Amenity		Galway Bay
	C1 - Town Centre/ Commercial		EM - Environmental Management		ACA Boundary
	C2 - Commercial / Mixed Use		A - Agriculture		

ORANMORE LAP 2012 - 2022 MAP 1A LAND USE ZONING

Note:
This map should be read in conjunction with Map 2A/2B - Specific Objectives, Map 3A/3B - Flood Risk Management, Map 4 - Designated Sites and the policies and objectives contained within Section 2 and Section 3 of the Local Area Plan, including those in relation to land use management and zoning.

APPENDIX III SITE INSPECTION PHOTOGRAPHS 05TH JANUARY 2018



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www.hydroenvironmental.ie

Appendix 9-1

Noise Surveys

Survey details

File	Project ref.	194
	Client	McCarthy Keville O'Sullivan
	Location	Moneyduff Oranmore Galway
	Stations	N1 N2 N3
	Purpose	Ambient survey re impact assessment
	Comment	N1 unattended
Event	Period	Daytime
	Date	31.05.18
	Day	Thursday
	Time	1030-1600
	Operator	Damian Brosnan BSc MSc MIOA MIEI
	Sound level meter	2250: N2 N3 2250L: N1
Conditions	Cloud cover	40 %
	Precipitation	0 mm
	Temperature	23 °C
Wind	Direction	SE
	Speed	0-1 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	Bruel & Kjaer Type 2250
	Instrument serial no.	2506594
	Microphone serial no.	2529531
	Application	BZ7224 Version 2.5
	Bandwidth	Broadband & 1/3 octaves
	Max. input level	141.16 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA-1650
	Sound field correction	Free-field
	Laboratory calibration	16.01.18
	Calibrating laboratory	Sonitus Systems
	Calibration certificate	Available on request
Onsite calibration	Time	31/05/2018 11:22:11
	Type	External
	Sensitivity	47.21 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Bruel & Kjaer Type 4231
	Instrument serial no.	2342544
	Laboratory calibration	16.01.18
	Calibrating laboratory	Sonitus Systems

	Calibration certificate	Available on request
Methodology	Standards	ISO 1996 (2007 & 2016)
	Microphone position	Free field, 1.5 m above ground level
	Intervals	Logging at 10 s
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-3 dB (station & weather dependent, estimated)
	Total	±5 dB (estimated, including expanded uncertainty)

File	Project ref.	194
	Client	McCarthy Keville O'Sullivan
	Location	Moneyduff Oranmore Galway
	Stations	N1 N2 N3
	Purpose	Ambient survey re impact assessment
	Comment	N1 unattended
Event	Period	Daytime
	Date	31.05.18
	Day	Thursday
	Time	1030-1600
	Operator	Damian Brosnan BSc MSc MIOA MIEI
	Sound level meter	2250: N2 N3 2250L: N1
Conditions	Cloud cover	40 %
	Precipitation	0 mm
	Temperature	23 °C
Wind	Direction	SE
	Speed	0-1 m/s
	Measurement	Anemo anemometer 2 m above ground level
Sound level meter	Instrument	Bruel & Kjaer Type 2250-L
	Instrument serial no.	2566801
	Microphone serial no.	2571655
	Application	BZ7130 Version 2.0
	Bandwidth	Broadband & 1/3 octaves
	Max. input level	142.66 dB
	Broadband weightings	Time: Fast Frequency: AC
	Spectrum weightings	Time: Fast Frequency: Z
	Windscreen correction	UA1404 outdoor kit
	Sound field correction	Free-field
	Laboratory calibration	16.01.18
	Calibrating laboratory	Sonitus Systems
	Calibration certificate	Available on request

Onsite calibration	Time	31/05/2018 10:36:28
	Type	External
	Sensitivity	42.57 mV/Pa
	Post survey check	93.9 dB
Onsite calibrator	Instrument	Brüel & Kjær Type 4231
	Instrument serial no.	2342544
	Laboratory calibration	16.01.18
	Calibrating laboratory	Sonitus Systems
	Calibration certificate	Available on request
Methodology	Standards	ISO 1996 (2007 & 2016)
	Microphone position	Free field, 1.5 m above ground level
	Intervals	Logging at 10 s
Uncertainty	Instrumentation	±1 dB (IEC 61672:2002 Class 1)
	External	±0-3 dB (station & weather dependent, estimated)
	Total	±5 dB (estimated, including expanded uncertainty)

Appendix 11-1

Moneyduff Testing Report

**RICHARD CRUMLISH, B.A., M.I.A.I.
CONSULTANT ARCHAEOLOGIST**

**REPORT ON
PRE-DEVELOPMENT TESTING
AT
MONEYDUFF TOWNLAND,
ORANMORE,
CO. GALWAY**

Excavation Licence No. 18 E 0132

April 2018

Report prepared by:

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CONTENTS

List of Abbreviations	Page 3
List of Illustrations	Page 4
List of Plates	Page 4
General Introduction	Pages 5-6
Archaeological Brief	Page 7
Locational Information	Pages 7-8
<i>Locational Details</i>	
<i>Access</i>	
<i>Siting</i>	
Summary	Page 8
The Excavation	Pages 9-16
Conclusion/Recommendations	Page 17

LIST OF ABBREVIATIONS

Av. Th.	Average Thickness	C	Context
E	East	F	Feature
Illus.	Illustration	ITM	Irish Transverse Mercator
m	metre	max.	maximum
mm	millimetre	N	North
NGC	National Grid Co-ordinates	OD	Ordnance Datum
OS	Ordnance Survey	RMP	Record of Monuments and Places
S	South	SAC	Special Area of Conservation
SMR	Sites and Monuments Record	Th.	Thickness
W	West		

LIST OF ILLUSTRATIONS

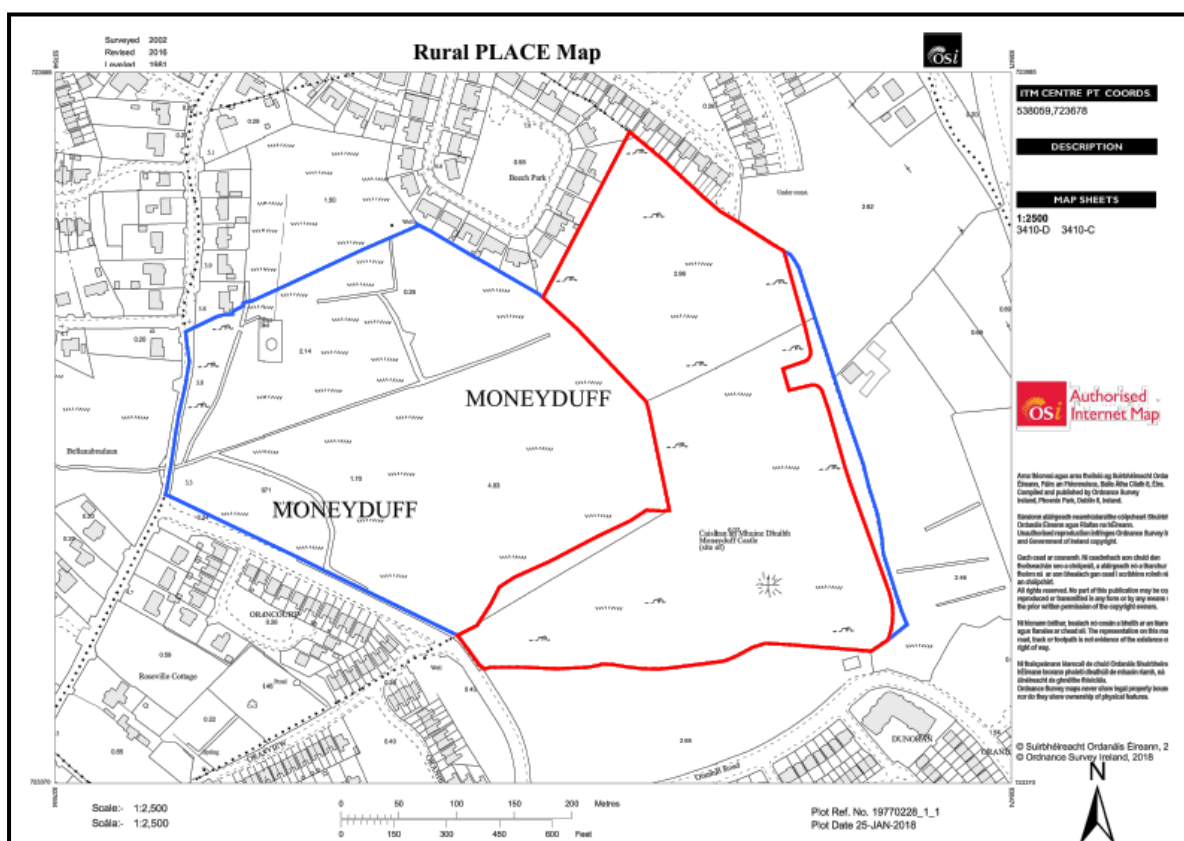
- Illus. 1** Site Location Map.
- Illus. 2** Proposed Site Layout.
- Illus. 3** Site Location Map (Extract from Galway RMP, Sheet No. 95).
- Illus. 4** Trench Layout.

LIST OF PLATES

- Plate No. 1** Midden (F1) in Trench A.
- Plate No. 2** Trench B completed from its NNW end, showing C7, C8 & C9.
- Plate No. 3** Trench D completed from its NNW end
- Plate No. 4** Trench E completed from its SSE end
- Plate No. 5** Burnt soil (C13) in Trench C. Taken from ENE.
- Plate No. 6** Trench F completed from its SSE end.
- Plate No. 7** Trench G completed from its WSW end.
- Plate No. 8** Trench H completed from its SSE end.
- Plate No. 9** Area of burning (F2) in Trench I, from NNW.
- Plate No. 10** Trench J completed from its SW end.
- Plate No. 11** Trench K completed from its WSW end.

GENERAL INTRODUCTION

This work was carried out by the writer between 26 and 29 March 2018 and involved the test excavation of a site in advance of its development at Moneyduff townland, off the Maree Road, on the southern outskirts of Oranmore, in County Galway (Illus. 1). The project is in the pre-planning phase with this report to accompany a planning application for the proposed development. Funding for the testing was provided by the client.



Illus. 1 Site Location Map (site outlined in red)

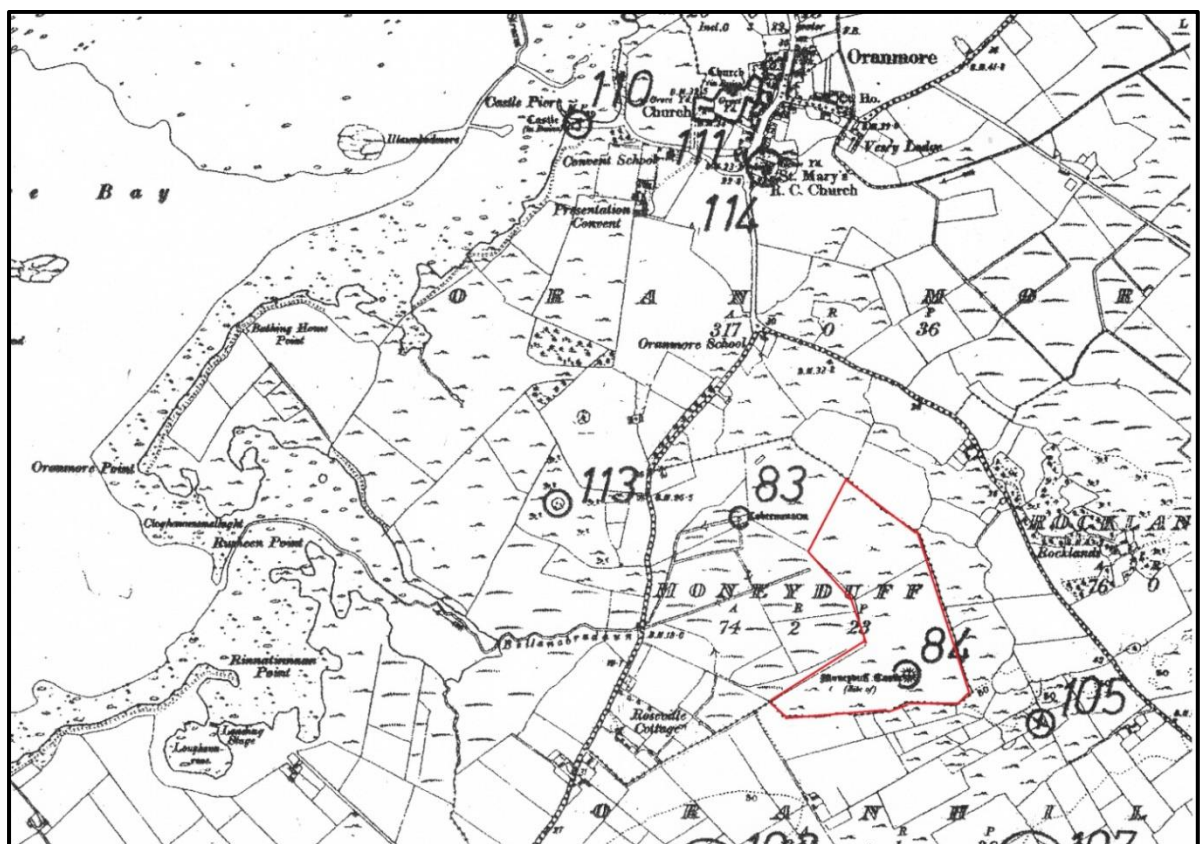
The proposed development will consist of 38 no. 4 bedroom semi-detached dwellings, 58 no. 3 bedroom semi-detached dwellings, 11 no. 4 bedroom detached dwellings, 29 no. 3 bedroom terraced dwellings, 24 no. 3 bedroom semi-detached (with attic and study) dwellings, 12 no. 4 bedroom detached (corner) dwellings, 20 no. 2 bedroom duplexes and a crèche (Illus. 2). The site area is 8.854 hectares.

The pre-development testing was required due to the size of the site, the scale of the proposed development and the location of a recorded monument, the site of Moneyduff Castle (RMP No. GA095-084), within the proposed development site (Illus. 1-3).

Pre-development testing at Moneyduff, Oranmore



Illus. 2 Proposed Site Layout



Illus. 3 Site Location Map (extract from Galway RMP, Sheet No. 95)

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ARCHAEOLOGICAL BRIEF

- A programme of test excavation to be carried out at locations chosen by the archaeologist, having consulted the site drawings and the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.
- Having completed the work, the archaeologist shall submit a written report to the planning authority and the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

LOCATIONAL INFORMATION

Locational Details

Townland:	Moneyduff	Parish:	Oranmore
Barony:	Dunkellin	OS 6-inch sheet:	Galway No. 95
OD:	5-15m	ITM:	538201, 723540

Access

Existing access to the proposed development is via the Maree Road out of Oranmore and the road along the N side of the Oranhill housing development, which is located to the SW of the site (Illus. 1).

Siting

The proposed development site is located across two fields. To the N of the site are two housing developments, 'Beech Park' and 'Coill Clocha'. To the E is pasture with an area of wasteground/scrub to the S. The site is bounded to the SW by a large housing development, 'Oranhill' and to the W by a relatively flat area of overgrown pasture and marsh which is part of the Galway Bay Complex SAC. The site boundaries to the E and S are substantial drystone walls and form the townland boundary between Moneyduff and Oranhill. Both are overgrown with ivy, ash, briars and ferns. The internal field boundaries are also overgrown drystone walls. The site boundaries along the modern housing to the NW and NE consist of concrete block walls with drystone walls to the SW (along 'Oranhill/Orancourt'). The SW boundary along Orancourt Road is lined with ash trees.

Pre-development testing at Moneyduff, Oranmore

The larger field to the S is of undulating pasture, which is overgrown with scrub in places. Rock outcrop is also visible in places. The area to the S and E of the site of Moneyduff Castle was particularly overgrown and inaccessible but has been partially cleared of vegetation in the recent past. The area to the N of the Moneyduff Castle site at the E end of the larger field has been subject to field clearance in the past with a number of spoil heaps visible.

The smaller field to the N has also been subject to field clearance with ground level clearly reduced in places and a number of large clearance cairns visible. Some areas are overgrown with scrub and rock outcrop is visible.

The castle (RMP No. GA095-084) is depicted and named '*Moneyduff Castle (Site of)*' on the 1st edition OS six-inch map of 1840, the OS 25-inch map of the late 19th/early 20th century and the 1920 edition of the OS six-inch map. It was the seat of David Ballagh and Slighe Tybact in 1574 (Nolan, 1901).

It is situated on a rise near the SE corner of the proposed development site (Illus. 1 & 3). What remains of the castle is an overgrown (hazel, grass and moss) rectangular area, which measures c. 8m E/W, situated over 5m above the surrounding land. There are good views in all directions from the castle site. The line of the walls are barely discernible, however, the SW corner of the castle is, with mortared rubble clearly visible. The interior of castle site is sunken and filled with loose rocks which are overgrown. Loose rocks are visible on the W and S slopes of the rise on which it is situated.

Apart from the site of Moneyduff Castle (RMP No. GA095-084), no other features of archaeological significance were in evidence within the proposed development site. An impact assessment compiled by the author in March 2018 recommended an exclusion zone of 20m around the recorded monument within which no development would take place.

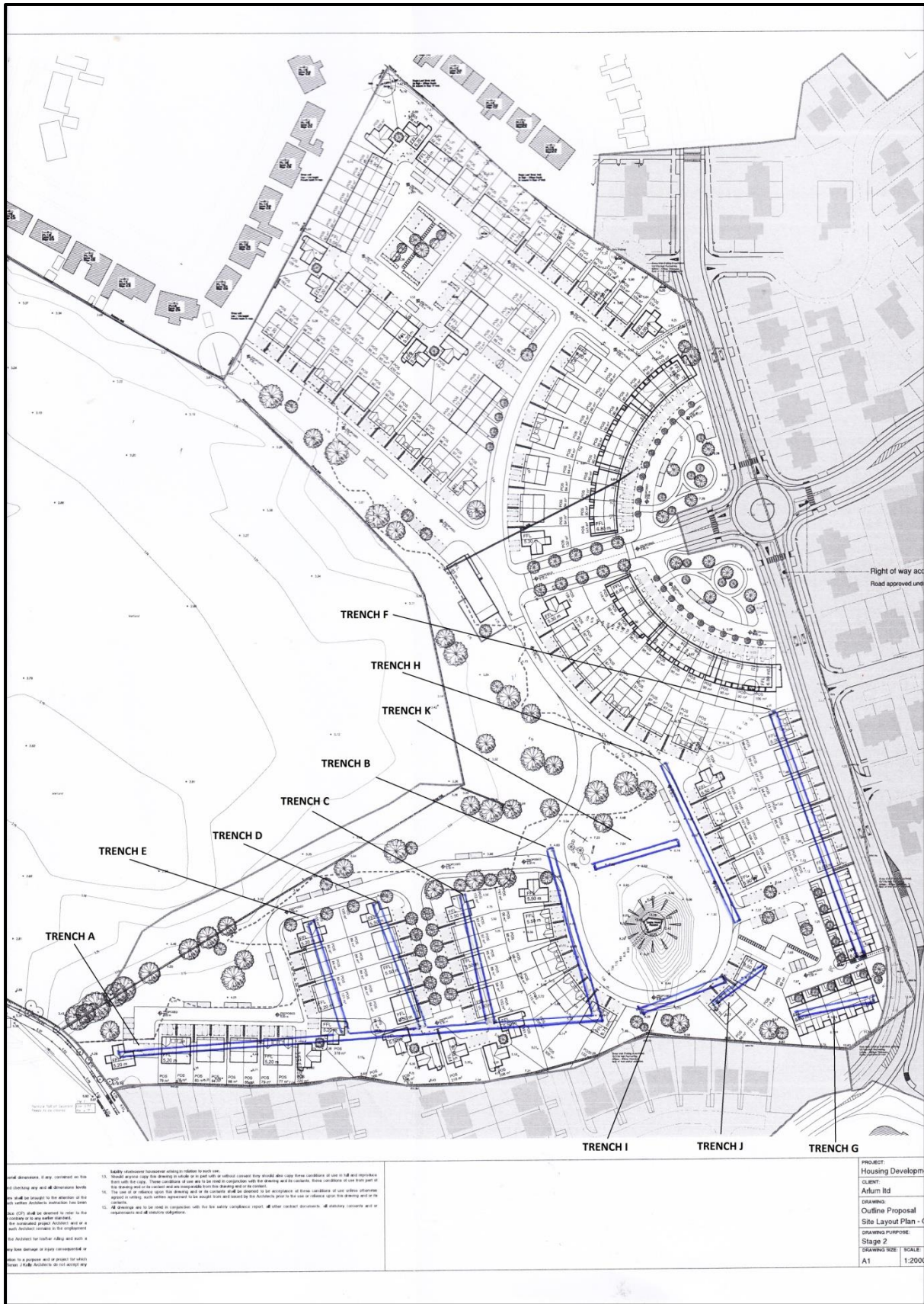
SUMMARY

The pre-development testing revealed evidence of natural undisturbed stratigraphy in all of the trenches, i.e. topsoil above natural subsoils and bedrock. Two features of potential archaeological significance were found, a midden in Trench A and an area of burning in Trench I.

THE EXCAVATION

The testing consisted of the excavation of eleven trenches, which were located to best cover the area of the proposed development site which has not been subject to field clearance and where levels have been reduced to bedrock, i.e. in the S and SE of the site (Illus. 4).

Trench A was located along the S site boundary, through fourteen (14) proposed dwellings and measured 220m E/W, 2.1-2.3m wide and 0.1-0.6m deep. Its W end was located 16m from the SW corner of the site and 12m from the W site boundary. Its E end was located 13m from the S site boundary. Trench B exited from the E end of Trench A and was located through three (3) proposed dwellings and the access road to the W of the castle site (RMP No. GA095-084). It measured 80.5m NNW/SSE, 2.2-2.3m wide and 0.1-0.75m deep. Its NNW end was located 45.5m from the NNW end of Trench C. Trench C exited at 41.8m from the E end of Trench A and was located through a line of seven (7) proposed dwellings. It measured 59.3m NNW/SSE, 2.1-2.3m wide and 0.15-0.6m deep. Its NNW end was located 37.5m from the NNW end of Trench D. Trench D exited at 82.2m from the E end of Trench A and was located through a line of seven (7) proposed dwellings. It measured 60m NNW/SSE, 2.1-2.3m wide and 0.15-0.5m deep. Its NNW end was located 25.5m from the N site boundary and 27.6m from the NNW end of Trench E. Trench E exited at 102m from the W end of Trench A and was located through a line of six (6) proposed dwellings. It measured 51m NNW/SSE, 2.1-2.2m wide and 0.15-0.5m deep. Its NNW end was located 18.8m from the N site boundary.



Pre-development testing at Moneyduff, Oranmore

Trench F was located along the E site boundary and located through a line of fifteen (15) proposed dwellings. It measured 119.5m NNW/SSE, 2.1-2.6m wide and 50-500mm deep. Its SSE end was located 30m from the S site boundary and 9.5m from the E site boundary. Its NNW end was located 10.3m from the E site boundary. Trench G was located in the SE corner of the site through five (5) proposed dwellings. It measured 36.5m ENE/WSW, 2.1-2.2m wide and up to 0.3m deep. Its ENE end was located 4.6m from the E site boundary and 10.1m from the S site boundary. Its WSW end was located 13m from the S site boundary. Trench H was located along the access road to the E of the castle site (RMP No. GA095-084) and measured 78.8m NNW/SSE, 2.1-2.3m wide and up to 0.65m deep. Its SSE end was located 55m from the S site boundary and 57.5m from the E site boundary. Its NNW end was located 65m from the E site boundary. Trench I was located along the access road to the S of the castle site (RMP No. GA095-084) and measured 40.5m ENE/WSW, 2.1-2.3m wide and 0.25-0.6m deep. Its ENE end was located 26.4m from the S site boundary and 73m from the E site boundary. Its WSW end was located 10.8m from the S site boundary. Trench J was located through four (4) proposed dwellings to the SE of the castle site (RMP No. GA095-084) and measured 28.9m NE/SW, 2.1-2.4m wide and 50-700mm deep. Its NE end was located 34m from the S site boundary and 56.5m from the E site boundary. Its SW end was located 12.5m from the S site boundary. Trench K was located across the proposed amenity area to the N of the castle site (RMP No. GA095-084) and measured 40m ENE/WSW, 2.1-2.5m wide and up to 0.7m deep. Its ENE end was located 63.5m N of the ENE end of Trench I and 7m from Trench H. Its WSW end was located 67m from the WSW end of Trench I.

The stratigraphy in Trench A consisted of topsoil (C1) above and orange/grey/brown plastic boulder clay (C2) and grey loose sand and gravel (C3). The topsoil (C1) measured 50-250mm thick. The clay (C2) contained a moderate amount of rocks. The sand and gravel (C3) was also visible below the clay (C2). An area of burnt soil (C4) was found on the surface at 109m from the W end of the trench. It (C4) measured 3m long and 0.1m thick. A second area of burnt soil (C5) was found on the surface at 126m from the W end of the trench. It (C5) measured 5m long and 0.1m thick.

Pre-development testing at Moneyduff, Oranmore



A midden (F1) was found below C1 and above C2, at 115.3m from the W end of the trench and at 0.2m below the surface. It (F1) was oval in plan and measured 0.7m N/S and 0.6m E/W. The midden contained oyster and periwinkle shells and one animal bone fragment in grey/brown friable silt loam (C6) (Plate No. 1).

Plate No. 1 Midden (F1) in Trench A.



On the surface in Trenches B, C, D and E was topsoil (C7, C10, C14 and C17), above orange/grey/brown plastic clay (C8, C11, C15 and C18) and grey loose sand and gravel (C9, C12, C16 and C19). (Plate Nos. 2, 3 & 4)

Plate No. 2 Trench B completed from its NNW end, showing C7, C8 & C9.

Pre-development testing at Moneyduff, Oranmore



Plate No. 3 Trench D completed from its NNW end

The topsoil (C7, C10, C14 and C17) measured 50-450mm thick. The sand and gravel (C9, C12, C16) was also visible below the clay (C8, C11, C15) in Trenches B, C and D (Plate Nos. 2 & 3).



The sand and gravel (C19) was found below the topsoil (C17) along a 11m section at the NNW end of Trench E (Plate No. 4). Both the clay (C8, C11, C15 and C18) and the sand and gravel (C9, C12, C16 and C19) contained a moderate amount of rocks.

Plate No. 4 Trench E completed from its SSE end



An area of burnt soil (C13) was visible on the surface at 2.9m from the SSE end of Trench C. It (C13) extended halfway across the trench width from its WSW side and measured 3.4m long and 0.2m thick (Plate No. 5).

Plate No. 5 Burnt soil (C13) in Trench C. Taken from ENE.

Pre-development testing at Moneyduff, Oranmore



Plate No. 6 Trench F completed from its SSE end.

The stratigraphy in Trench F consisted of topsoil (C20) on the surface above orange/grey/brown plastic clay (C21) and bedrock (C22) (Plate No. 6). Below the clay (C21) was grey loose sand and gravel (C23), which was visible in a few places.

The topsoil (C20) measured 50-300mm thick. The clay (C21) contained a moderate amount of rocks. The bedrock (C22), visible as high as 50mm below the surface, was also found below the clay (C21).



Plate No. 7 Trench G completed from its WSW end.

On the surface of Trench G was topsoil (C24) and bedrock (C25). Orange/grey/brown plastic clay (C26) was found below the topsoil (C24) at the ENE end of the trench. Little or no excavation was possible along this trench due to the bedrock (C25) on or near the surface (Plate No. 7).

Pre-development testing at Moneyduff, Oranmore



Plate No. 8 Trench H completed from its SSE end.

The sand and gravel (C29) was also found below the clay (C28). Both the clay (C28) and the sand and gravel (C29) contained a moderate amount of rocks. The bedrock (C30) outcropped in places.

Below the topsoil (C31) in Trench I was orange/grey/brown plastic clay (C32), grey loose sand and gravel (C33) and grey boulder clay (C43). The topsoil (C31) contained some oyster and periwinkle shells and measured 0.1-0.3m thick. The sand and gravel (C33) was also found below the clay (C32). The clay (C32) and the sand and gravel (C33) contained occasional rocks.



Plate No. 9 F2 in Trench I, from NNW.

The stratigraphy in Trench H was topsoil (C27) above orange/grey/brown plastic clay (C28), grey loose sand and gravel (C29) and bedrock (C30) (Plate No. 8). The topsoil (C27) measured up to 0.5m thick and contained oyster shell fragments and traces of mortar.

An area of burning (F2) extended out of SSE side of the trench at 12.1m from its WSW end. It (F2) was visible below the topsoil (C31) at 0.3m below the surface and measured 1.4m ENE/WSW and 0.7m (max.) NNW/SSE (Plate No. 9).

Pre-development testing at Moneyduff, Oranmore

The feature (F2) was roughly rectangular in plan and consisted of blackened soil (C34) which contained charcoal and tiny fragments of burnt stone (Plate No. 9).



Plate No. 10 Trench J completed from its SW end.

The stratigraphy in Trench J was topsoil (C35) above orange/grey/brown plastic clay (C36) and grey loose and gravel (C37) (Plate No. 10). The topsoil (C35) measured 50-300mm thick.



Plate No. 11 Trench K completed from its WSW end.

Below the topsoil (C38) in Trench K was orange/grey/brown plastic clay (C39), grey loose sand and gravel (C40), bedrock (C41) and grey plastic boulder clay (C42) (Plate No. 11).

The topsoil (C38) contained oyster and periwinkle shells and measured up to 0.4m thick. Bedrock (C41) was also found on the surface in places.

CONCLUSION/RECOMMENDATIONS

The stratigraphy consisted of topsoil (C1, C7, C10, C14, C17, C20, C24, C27, C31, C35 and C38) above natural subsoils (C2, C3, C8, C9, C11, C12, C15, C16, C18, C19, C21, C23, C26, C28, C29, C32, C33, C36, C37, C39, C40 and C42) and bedrock (C22, C25, C30 and C41) in all eleven trenches.

The three areas of burning (C4, C5 and C13) found on the surface in Trenches A and C are modern and probably related to the reclamation or clearing of the land which took place here in recent years.

Two features of potential archaeological significance were uncovered, a midden (F1/C6) in Trench A and an area of burning (F2/C34) in Trench I. Without full excavation it is not possible to date these features, which may be associated with Moneyduff Castle (RMP No. GA095-084).

Prior to any future development at this site the two features of potential archaeological significance (F1 and F2) should be archaeologically resolved. Due to the potential for further archaeological features surviving on the site, possibly associated with Moneyduff Castle (RMP No. GA095-084), the stripping of topsoil in advance of any proposed development should be monitored by a suitably qualified archaeologist within a radius of 30m of the 20m area excluded from development around the recorded monument (RMP No. GA095-084), i.e. a radius of 50m from the castle site.



Richard Crumlish

10.4.18

**ALL RECOMMENDATIONS ARE SUBJECT TO THE FINAL APPROVAL OF THE
DEPARTMENT OF CULTURE, HERITAGE AND THE GAELTACHT**

Appendix 11-2

Conservation Management Plan for Moneyduff Castle

ANNE CAREY
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Conservation Management Plan
for
site of Moneyduff Castle,
Oranmore, Co. Galway.
Planning Ref.: APB 301193-18



Client: *Arlum Ltd., Wolfe Tone House, Fr. Griffin Road, Galway.*
Report: *Anne Carey, Historic Buildings Consultant*
Richard Crumlish, Archaeologist

COMPILED BY:

Archaeology:	Richard Crumlish
Historic Buildings:	Anne Carey

EXECUTIVE SUMMARY

Moneyduff Castle is thought to have been medieval tower house, though little of its history is known. The Historic Mapping (First Edition, 1838, Second Edition, 1890-98) shows the 'site of' the castle as occupying a mound on the south-eastern side of Moneyduff townland. This mound occupies a prominent location on a natural rocky outcrop and is surmounted by the remains of a denuded rectangular wall, part of which is bonded with a cementitious mortar.

A Conservation Management Plan was prepared in response to the proposed development of the area surrounding the 'site of' Moneyduff Castle. The current state of the site was investigated and a number of options for its preservation were considered. Due to the complex nature of the site and its setting, the conservation of the site as an accessible area within the proposed development is the preferred option. It is important that the character and setting of the site be conserved within the proposed residential development. The preservation of this site into the future must be carried out under specialist supervision and always with the consent of the relevant authorities.

The Conservation Management Plan which follows:

- describes the site
- assesses the significance of the site
- analyses the conservation needs of the site
- proposes an appropriate action plan for the preservation of the site within the proposed development

Contents

Executive Summary.....	2
List of Illustrations.....	5
List of Plates.....	5
1. Introduction.....	6
1.1 Description of the Site.....	6
1.2 Conservation Management Plan.....	8
1.3 Statutory Protection	9
1.4 Aims and Objective	9
1.5 Locational Information.....	10
1.6 Siting and Access.....	10
2. Methodology.....	10
2.1 Guiding Principles.....	10
2.2 Research and Analysis.....	11
3. Historical Information.....	13
3.1 Description of Historical Place.....	13
3.2 Historical Background.....	13
4. Architectural and Architectural Description.....	14
4.1 General Description.....	14
5. Assessment of Significance.....	18
5.1 Introduction.....	18
5.2 Statement of Significance.....	18
5.3 Vulnerability of Site.....	19

6. Policy Aims and Objectives.....	19
6.1 Assessment of Conservation Needs	19
6.2 Discussion	20
7. Heritage Impact Assessment.....	21
7.1 Proposed Conservation Works.....	21
8. Conclusions.....	22

List of Illustrations

Illus. 1 Site Location Map.

Illus. 2 Aerial photograph of site of Moneyduff Castle.

Illus. 3 Extract of OS 6" Sheet GA095, RMP Edition showing RMP No. GA095-084, Moneyduff Castle (Site of). Ordnance Survey Ireland Licence No. EN0066018

Illus. 4 First Edition OS 6" map of 1838.

Illus. 5 Second Edition OS 25" map of 1890-98.

Illus. 6 Cassini edition of the OS 6" map of 1915-20.

Illus. 7 Extract from Historic Environment Viewer, showing Zone of Notification around the site of Moneyduff Castle.

List of Plates

Plate 1 Site of Moneyduff Castle, from south-west.

Plate 2 South-west corner of Moneyduff Castle.

Plate 3 Detail of aggregate-rich cementitious mortar adhering to undressed stone.

Plate 4 Loose stone on south-western downslope of mound.

Plate 5 Dished area enclosed by mortared stone walls on top of summit of mound.

Plate 6 Site of Moneyduff Castle, from south-west.

Plate 7 Site of Moneyduff Castle, from south-east.

Plate 8 Moneyduff Castle, from east.

Plate 9 Moneyduff Castle, from north-west.

Plate 10 Grass-covered wall at north-west.

Plate 11 Moneyduff Castle, from south-east.

Plate 12 Interior of ruined castle, from south-west.

Plate 13 Masonry walling at south-west.

1. Introduction

1.1 Description of the Site

The site of the proposed housing development at Moneyduff townland comprises two fields on the southern outskirts of the village of Oranmore (Illus. 1). Existing modern housing developments surround the site to the north and the southwest, with waste ground/scrub to the south. The site is bordered to the west by a relatively flat area of overgrown pasture and marsh which is part of the Galway Bay Complex SAC. Much of the eastern half of the proposed development site is overgrown with ivy, ash, briars and ferns, with ground level rising to low mounds and ridges in this area, contrasting with the flat low-lying ground to the west.

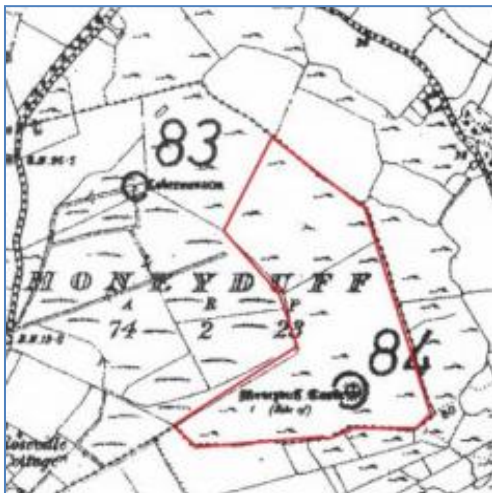
The larger field to the south is of undulating pasture, which is overgrown with scrub in places with rock outcrop also visible. The area to the south and east of the site of Moneyduff Castle is particularly overgrown and inaccessible. The area to the north of the castle site at the north end of the larger field has been subject to field clearance in the past with a number of spoil heaps visible.



Illus. 1 Site Location Map.



Illus. 2 Aerial photograph of site of Moneyduff Castle.



Illus. 3 Extract of OS 6" Sheet GA095, RMP Edition showing RMP No. GA095-084, Moneyduff Castle (Site of).

Ordnance Survey Ireland Licence No. EN0066018

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Plate 1 Site of Moneyduff Castle, from south-west.

1.2 Conservation Management Plan

“Preparation of a conservation plan encourages those with responsibility for the site to think about it in a structured way, to assess how and why it is significant, and how it should be managed in order to conserve that cultural significance. Conservation plans should meet the needs of the site and the requirements of its owner”

A Guide to the Preparation of Conservation Plans, Historic Scotland

The preparation of this Conservation Management Plan was recommended by Richard Crumlish in his Archaeological Impact Assessment, November, 2017 (p. 10) and further recommended by the National Monuments Service in a response on 4th May, 2019, to an An Bord Pleanála consultation under Section 6 (10) of the Planning and Development (Housing) and Residential Tenancies Act, 2016 (ABP 301193-18). A conservation and management proposal was requested from the National Monuments Service to ensure the future preservation of the Recorded Monument. It includes an archaeological assessment of the site, which has been prepared by Richard Crumlish, Archaeologist and an architectural conservation assessment by Anne Carey, Historic Buildings Consultant and archaeologist.

The Conservation Management Plan identifies the diverse elements that contribute to the significance of the site. It also puts forward proposals to conserve vulnerable sections within the site without threatening the components that help define its significance.

The Conservation Management Plan contains the following information:

- it describes the archaeological and architectural aspects of the site
- it identify features within the site in need of conservation works
- it provides a foundation on which to base a proper maintenance programme for the care and conservation of the site

1.3 Statutory Protection

As a recorded monument, Moneyduff Castle (RMP No. GA095-084) is protected under the National Monuments Acts 1930 to 2014. Though Moneyduff Castle is depicted as 'site of' on the historic mapping, original and/or associated features, deposits and/or artefacts may be located in the immediate vicinity (Illus.'s 4-6).

In accordance with Section 12(3) of the National Monuments (Amendment) Act 1994, anyone who proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to a recorded monument shall give notice in writing to the Minister for Culture, Heritage and the Gaeltacht of the proposal to carry out work and shall not except in the case of urgent necessity, and with the consent of the Minister, commence the work until two months after giving of notice.

Any proposed development on a site which is included in the RMP also requires planning permission from the Local Authority. Under Article 9 (i) (vii) of the Planning and Development Regulations 2001 any development which would:

consist of or comprise the excavation, alteration or demolition (other than peat extraction) of places, caves, sites, features or other objects of archaeological, geological, or historical, scientific or ecological interest, the preservation of which is an objective of a development plan for the area in which the development is proposed or, pending the variation of a development plan or the making of a new development plan, in the draft variation of the development plan or the draft development plan, save any excavation, pursuant to and in accordance with a licence granted under Section 26 of the National Monuments Act, 1930 (No. 2 of 1930) shall not be exempted development and therefore requires planning permission.

1.4 Aims and Objectives

The aim of the conservation management plan is to compile a detailed analysis of the site in question and to put forward proposals to ensure the conservation and protection of the site. The report will also include a heritage impact assessment of the proposal. The following has been carried out on the site:

- Research on the site.

- Site visit and recording the condition of the site.
- Photographic record of site.
- Recommendations on the care and conservation of the site.

1.5 Locational Information

Townland	Moneyduff	County	Galway
Parish	Oranmore	OS 6" Sheet	GA095
RMP No.	RMP No. GA095-084	RMP Designation	<i>castle, unclassified</i>
Form of Statutory Protection	National Monuments Acts 1930-2014		

1.6 Siting and Access

The site of Moneyduff Castle is located on the southern side of the village of Oranmore, west of the Galway to Gort road (N18) but accessed via the local road leading from Oranmore to Rinville (Illus. 1). Access is gained via the roadway serving the Oranhill housing estate which is located to the south and south-west of the site and then via a field under pasture.

2. Methodology

2.1 Guiding Principles

This report is carried out in compliance with International Council on Monuments and Sites (ICOMOS) and Historic Scotland's guidelines on Conservation Management Plans. The Plan follows the Department of the Environment 'Architectural Protection Guidelines for Planning Authorities'; Department of the Environment Advice Series; The Royal Institute of Architects of Ireland 'Guidelines for the Conservation of Buildings', and The Heritage Council's 'Guidance for the Care, Conservation and

Recording of Historic Graveyards'. A combined survey strategy was employed which consisted of the assessment of the archaeological, architectural and cultural heritage was based on a desktop study of published and unpublished documentary and cartographic sources, followed by a field visit. This consisted of:

- Consultation of primary sources including maps and relevant depositories
- Site inspections
- Photographic records
- Written descriptions

2.2 Research and Analysis

The main sources consulted included:

- The Record of Monuments and Places
- Aerial Photographs
- Irish Excavations Database
- The National Inventory of Architectural Heritage
- Cartographic Sources
- Photographic records
- Local Historical Societies
- Relevant publications and literature

Record of Monuments and Places

The RMP of the Department of Culture, Heritage and the Gaeltacht was established under the 1994 Amendment to the National Monuments Acts (1930-05). It is based on the pre-existing Sites and Monuments Record (SMR) and information from completed county archaeological inventories. As such, it records known upstanding archaeological monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as crop marks on vertical aerial photographs. The RMP information is compiled from the files of the Archaeological Survey, which combines cartographic sources, published and publicly available documentary sources, including periodicals, the records of the NMI, Geological Survey of Ireland 1:30,000 vertical aerial photographs and inspections of sites in the field. The information is read in conjunction with constraint maps, published at reduced six-inch scale, on which recorded sites are clearly marked. The RMP is constantly updated and is the first stage in the preparation of a national census of archaeological sites, with

inventories also published at an interim stage. The RMP sheet relevant to the project is sheet 118 of the O.S six-inch series for Mayo (which is based on the OS revision of 1913-14).

Aerial Photographs

Aerial photographs are an invaluable resource in archaeology for the recognition of new sites and contributing to the understanding of known sites. Features can be recognised from the air as earthworks in relief or as vegetation marks where a buried feature such as a wall or ditch affects the growth of the surrounding flora. The Geological Survey of Ireland Aerial Photograph Collection, based in Dublin, holds a comprehensive archive of high-level vertical photographs available for consultation by the public and researchers but may not be copied.

Irish Excavations Database

'Excavations' is an annual bulletin, now funded by the Department of the Environment, Heritage and Local Government, which contains summary accounts of all excavations carried out in Ireland – North and South. The bulletins can now be accessed on the Internet at www.excavations.ie. Compiled from the published excavation bulletins, the database contains summary accounts of all excavations carried out from 1970 to 2017. Both the bulletins and database were consulted to establish whether excavations have been previously carried out in the vicinity of the proposed development.

The National Inventory of Architectural Heritage

The NIAH is a section within the Department of Culture, Heritage and the Gaeltacht. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner.

Cartographic Sources

Cartographic sources consulted include the first edition map of the Ordnance Survey (O.S) six-inch series published in 1836.

3. Historical Information

3.1 Description of Historical Place

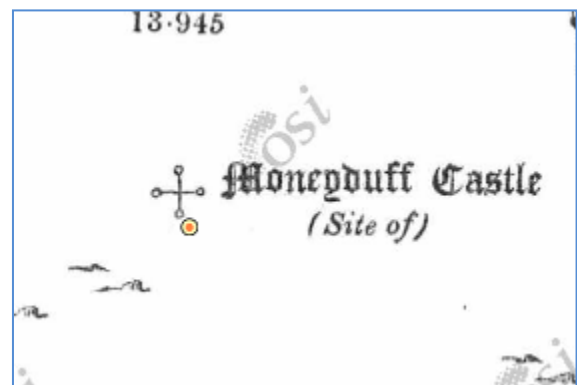
The site of Moneyduff Castle (RMP No. GA095-084) is located in the townland of Moneyduff, in the parish of Oranmore and the barony of Dunkellin. The name derives from the Irish *Muine Dubh*, meaning ‘black copse or thicket’.

3.2 Historical Background

Little is known about Moneyduff Castle. It is recorded as the seat of David Ballagh and Slighe Tybact in 1574 (Nolan, 1901), but the origin and occupation of the site is not known. It is depicted and named ‘Moneyduff Castle (Site of)’ on the First Edition OS 6” map of 1838, the Second Edition OS 25” map of 1890-98 and the 1920 Cassini edition of the OS 6” map (Illus.’s 4-6). Only the First Edition Map (Illus. 4) shows evidence of any structural feature on the site, with a rectangular building indicated on top of the mound, which is shown surrounded by a scatter of rocks.



Illus. 4 First Edition OS 6” map of 1838.



Illus. 5 Second Edition OS 25” map of 1890-98.

Illus. 6 Cassini edition of the OS 6” map of 1915-20.



4. Archaeological and Architectural Description

4.1 General Description

Field walking and pre-development testing were carried out on the site of the proposed development at Moneyduff townland by Richard Crumlish, Archaeologist, in November, 2017 and March, 2018 respectively. While no extant features apart from the site of Moneyduff Castle, Recorded Monument (GA095-084) were noted during field walking, two features of potential archaeological significance were uncovered during the pre-development testing; a midden (F1/C6) in Trench A and an area of burning (F2/C34) in Trench I.

The *in situ* architectural remains associated with the site of Moneyduff Castle are located on a small mound near the south-east corner of the proposed development site (Illus.'s 2-3; Plate 1). The extant remains comprise a roughly rectangular setting of stone walling, measuring 6.5m north-south and 8m east-west, extending only to three or four courses of medium-sized unhewn stone bonded with a strong mortar (Plates 2-3). The mortar appeared very rough and was not well finished and it was unusually strong for what was at first presumed to be a lime and sand mix. An examination of the mortar shows that while it is composed of sand, a large amount of aggregate and a small amount of lime, it also contains cement, which appears to account for its unusual strength. A sample was shown to have a porous texture, which is not associated with lime mortars but known from cementitious mixes¹. The walling, which has a maximum height of 1m varies in width from 1m to 2m. Due to the excessive growth of vegetation and to the denuded nature of the rectangular feature, only one area of the walling, that to the south-east, showed a clear, though rough, external face and no clear internal faces were noted in any area. The rectangular wall encloses a dished moss-covered area set on the summit of the mound. The sides of the mound below the rectangular feature are strewn with limestone blocks (Plate 4), some of which are covered with moss and a mantle of grass and there is a dense growth of hazel and other shrubs surrounding the masonry remains and extending to

¹ Laurik Mathieu, Conservation stonemason, pers comm.

the base of the mound. Further areas of cementitious mortar were noted on the southeastern down-slope, where they appear disturbed/re-deposited.



Plate 2 South-west corner of Moneyduff Castle.



Plate 3 Detail of aggregate-rich cementitious mortar adhering to undressed stone.



Plate 4 Loose stone on southwestern down slope of mound.



Plate 5 Dished area enclosed by mortared stone walls on top of summit of mound.



Plate 6 Site of Moneyduff Castle, from south-west.



Plate 7 Site of Moneyduff Castle, from southeast.



Plate 8 Moneyduff Castle, from east.



Plate 9 Moneyduff Castle, from north-west.



Plate 10 Grass-covered wall at north-west.

An examination of the walling at the south-east of the ruined rectangular structure showed it to be constructed of an external face and a hearting but with no internal face evident (Plate 5). The outer face is constructed of limestone random rubble masonry with no dressed stone in evidence. The masonry was bonded with a strong lime and cement mortar but it is not clear when this material would have been introduced to the site. Moss and grass cover the stones elsewhere, with hazel and ivy obscuring the north-western and preventing access to this area.



Plate 11 Moneyduff Castle, from



Plate 12 Interior of ruined castle, from south-west.



Plate 13 Masonry walling at south-west.

5. Assessment of Significance

5.1 Introduction

Little is known about Moneyduff Castle but the limited historic records relating to the site indicate it was extant in the mid-sixteenth century. It is possible the site was a tower house but it is not possible to classify the castle based solely on the remains currently on the site, which may be of more recent date. The rectangular structure currently on the top of the mound appears to have been extant in the mid-nineteenth century, as it is marked on the First Edition OS 6" Map, 1838, but the term 'site of' on the OS map suggests the castle itself was not extant and that the clearly marked rectangular structure may be later. It is also unclear if features possibly associated with the castle, such as a bawn wall or other functional buildings, were constructed in the vicinity. The archaeological testing undertaken by Richard Crumliss near the base of the mound did not reveal any structural remains.

5.2 Statement of Significance

The significance of the site of Moneyduff Castle can be seen in two main areas. The first is the historic value of the area through its association with the non-extant medieval castle. The 'site of' the castle is a Recorded Monument by virtue of its archaeological and historic nature. The original castle most likely formed part of the wider group of castles in the barony of Dunkellin, connected by their similarities in their dates and construction.

The second strand of significance of the site is its place in the local community. The Archaeological Survey of Ireland noted that 'current local tradition' held that the castle was located on the mound in Moneyduff townland. This mound is a prominent feature in the landscape and it will continue to be visible during and after the completion of the proposed housing development. The site of the castle also has an educational value and its preservation and the retention of its setting is an important factor in the development.

5.3 Vulnerability of Site

The ruined rectangular structure on top of the mound is very vulnerable in a number of ways. It is physically vulnerable in that it is a mortared masonry structure, roofless and without shelter. It appears to have been the subject of previous attempts at consolidation through the addition of what is most likely early to mid-twentieth century cementitious mortar. The feature survives as severely denuded low-level walls with rubble collapse in the interior. The location of the site within a housing development adds to the vulnerability of the site, unless conservation actions are taken. During the construction phase of the development, it will be vulnerable to accidental damage unless safety measures are put in place. It will continue to be vulnerable to damage when it is more accessible to the public following the completion of the housing development, if left in its current state.

6. Policy Aims and Objectives

6.1. Assessment and Analysis of Conservation Needs

The conservation needs of the site at Moneyduff, Recorded Monument, are complex. This is partly due to the incorporation of the site of a castle with possibly later structural remains present, in a housing development, as the conservation methodology must be formulated around some element of public interaction or access. The guiding principle of any works undertaken in the vicinity of a site like the site of Moneyduff Castle would stress minimal intervention, in compliance with best conservation practice. A buffer zone of 20m from the known edge of the Recorded Monument has been established within the development, with the intention to keep the site unfenced and open, allowing public access.

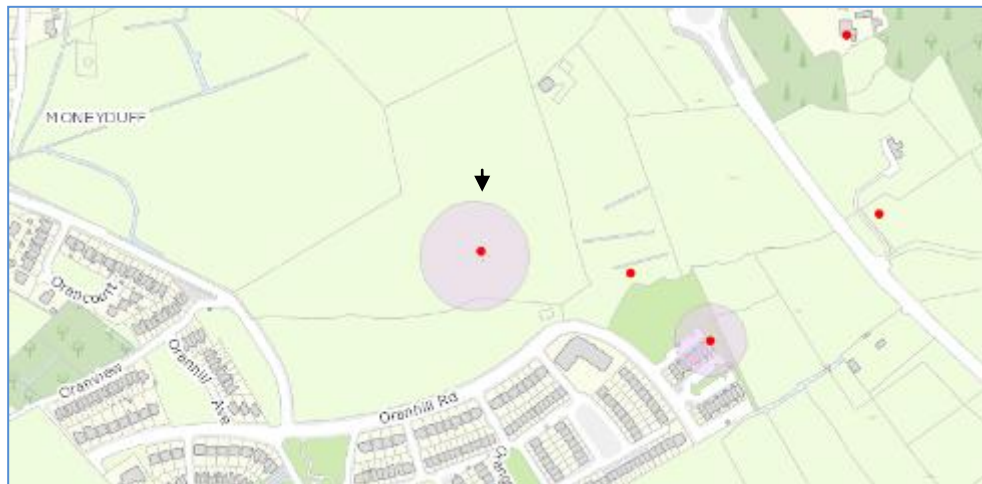
The site as it currently stands is unsafe for general public access but it is acknowledged that its location in the housing development means it will inevitably be accessed by the public. The options for the conservation of the site are as follows:

1. 'Do nothing' scenario. A 'do nothing' scenario would see the site in its current condition within the housing development, which would put the structural remains at risk and which involves a number of hazards to the public.
2. Erection of signage. The lowest level of action on the site comprises the erection of durable robust signage advising the public not to access the site and stating the historic significance of the site of the monument as well as details of its legal protection. It is felt that this action alone would not be sufficient.
3. Fencing the site. The construction of a fence of sufficient height and strength to prevent unregulated public access would potentially have a negative impact on the visual amenity of the site, particularly if this fence was at the base of the mound. This is not an option that the design team wish to pursue.
4. Conservation of the site. These works would comprise the conservation of the structural remains on the site and the landscaping of the rocky sides of the mound to allow public access via agreed paths. The aim would be to preserve the remains on the site and to facilitate the presentation of the site to the public, allowing public access following a detailed programme of works. Durable signage should also be provided, giving information on the historic significance the site.

6.2. Discussion

The preferred option is conservation of the site. This involves the removal of vegetation from the site under archaeological supervision. Following the clearance of vegetation from the site, it is proposed that archaeological investigations on the nature and extent of the existing structure are carried out. This would involve the removal of grass and moss from the walls and the area the walls enclose. Once the full extent of the masonry feature is revealed, the structural remains would be subject to conservation works, agreed with the National Monuments Service. These works would be carried out in accordance with a detailed method statement drawn up by the archaeologist and a conservation architect, and carried out by a conservation stonemason, according to best conservation practice. A method statement should also be prepared by a landscape architect on proposals to make the mound safe to access

for the public, including details of any proposed paths in the vicinity of the structural remains.



Illus. 7 Extract from Historic Environment Viewer, showing Zone of Notification around the site of Moneyduff Castle.

7. Heritage Impact Assessment

7.1 Proposed Conservation Works

The appearance of the site would be significantly altered as a result of the proposed works, with the feature on the summit of the mound visible and accessible and the sides of the mound made safe for public access. The works would have a positive impact on the heritage of the site as they would allow a detailed analysis of the remains and facilitate the preservation and presentation of these remains. The conservation of the site in the manner proposed would be preferable to other options presented above, including the erection of an enclosing fence that would cause further problems in terms of the ongoing control of vegetation within the enclosed area. Fencing off the site would also not realistically address the issue of public access.

10. Conclusions

The site of Moneyduff Castle, an unclassified late-medieval non-extant castle, is believed to have occupied the top of a natural rock-strewn mound in the southeastern side of Moneyduff townland, Oranmore, Co. Galway. The site as it currently stands comprises a rectangular setting of low denuded stone walls, enclosing a dished area, much of which is obscured from view by a dense growth of vegetation. The mortared remains appear stable, due in part to the application at some time in the early to mid-twentieth century of a cementitious mortar at the southeastern corner of the extant walling of the rectangular structure. The principal proposal in this Conservation Management Plan relates to managing the future threats to the site, which mainly comprise potential human damage due to public access.

A number of options are put forward to appropriately manage the site of the castle in the light of the proposed development. These include a ‘do-nothing’ scenario, where the site is left in its current state and an option for the erection of signage, which would advise the public of the presence of a Recorded Monument. A third option would be to fence off the site from the proposed development and to manage the growth of vegetation on the mound through periodic cutting-back of vegetation. The fourth option involves the full conservation of the site, with additional landscaping to make the mound on which the structural remains are located safer to access. The fourth option is the preferred choice as it will ensure the preservation of the site and it will also facilitate safe public access. It is intended that the conservation of the site will be carried out on a phased basis, with the results of each phase informing the next phase. Method statements for each phase will be prepared by the relevant consultants and submitted to the National Monuments Service for approval prior to any works being undertaken. The first phase will involve the clearance of the site of vegetation under archaeological supervision and the archaeological assessment under licence of the structure on the summit of the mound.

*All recommendations are subject to the approval of the National Monuments
Section, Department of the Culture, Heritage and the Gaeltacht.*

A handwritten signature in dark ink, reading "Anne Carey". The signature is written in a cursive style, with the first name "Anne" and the last name "Carey" clearly distinguishable. The signature is positioned above a horizontal line.

Anne Carey

Appendix 1

General Recommendations

1. Consult with your local National Parks and Wildlife Conservation Ranger regarding protected species within the site and comply with their recommendations.
2. All works should comply with all legislation, policy and guidance documents.
3. No machinery should be brought onto the site.
4. All excavation/digging must be undertaken by hand and under licence from the DCHG and the National Museum of Ireland.
5. The topography of the site should not be altered without prior consultation with the National Monuments Service *i.e.* no ground level reduction or major importing of soil should take place.
6. No vegetation should be removed during the bird nesting season from 1st March to 31st August inclusive.
7. No weed killer should be used on site.
8. Ivy and/or other dense vegetation should only be removed from masonry structures under advice from a conservation specialist.



Appendix 11-3

Abbreviations

List of Abbreviations

c. *circa*

CGDP County Galway Development Plan

E East

m metre

max. maximum

mm millimetre

N North

NGC National Grid Co-ordinates

NIAH National Inventory of Architectural Heritage

NMI National Museum of Ireland

OD Ordnance Datum

OS Ordnance Survey

RMP Record of Monuments and Places

RPS Record of Protected Structures

S South

SAC Special Area of Conservation

SMR Sites and Monuments Record

W West

***All recommendations contained in this assessment are subject to the final approval of the National Monuments Service, Department of Culture, Heritage and the Gaeltacht**

Appendix 12-1

Traffic and Transportation Statement

**Proposed Residential Development
At Moneyduff, Oranmore,
Co. Galway
For
Arlum Ltd.**

**Traffic and Transportation Statement
Planning Stage**

Rev C

June 2018

TOBIN CONSULTING ENGINEERS



Traffic and Transportation Statement

PROJECT:

**Proposed Residential Development at
Moneyduff, Oranmore, Co. Galway**

CLIENT:

Arlum Ltd.

COMPANY:

TOBIN Consulting Engineers
Fairgreen House
Fairgreen
Galway

www.tobin.ie

DOCUMENT AMENDMENT RECORD

Client: Arlum Ltd.

Project: Proposed Residential Development at Moneyduff, Oranmore, Co. Galway

Title: Traffic and Transportation Statement

PROJECT NUMBER: 10402				DOCUMENT REF: 10402-TR01			
C	Issue for Planning	RD	13/06/18	BR	13/06/18	BH	13/06/18
B	Issue	RD	08/06/18	BR	08/06/18	BH	08/06/18
A	Issue	ML	27/02/18	BR	27/02/18	BH	28/02/18
Revision	Description & Rationale	Originated	Date	Checked	Date	Authorised	Date
TOBIN Consulting Engineers							

Table of Contents

Contents

1 INTRODUCTION	3
1.1 PROPOSED DEVELOPMENT	3
2 ROAD NETWORK INFRASTRUCTURE	3
2.1 EXISTING ROAD NETWORK INFRASTRUCTURE	3
2.2 PROPOSED ROAD NETWORK INFRASTRUCTURE.....	4
3 GALWAY COUNTY COUNCIL SCOPING.....	5
4 TRAFFIC GENERATION	6
5 DESIGN GUIDELINES	7
6 CAR & BICYCLE PARKING PROVISION	8
7 ROAD SAFETY	8
8 MOBILITY MANAGEMENT PLAN.....	9
8.1 INTRODUCTION.....	9
8.2 WALKING.....	11
8.3 CYCLING	13
8.4 PUBLIC TRANSPORT	13
9 CONCLUSION	14

List of Appendices

Appendix A – TRICS Data

1 INTRODUCTION

TOBIN Consulting Engineers were appointed by Arlum Ltd. to provide design consultancy services for a new Residential Development at Moneyduff, Oranmore Co. Galway in December 2017. As part of these services, TOBIN were tasked with the liaising with Galway County Council on the requirements relating to Traffic and Transport in support of this Strategic Housing Development application.

1.1 PROPOSED DEVELOPMENT

The proposed development will consist of the following:

1. Construction of 212 no. residential units comprising:
 - 34 no. House Type A (four-bed semi-detached unit)
 - 54 no. House Type B (three-bed semi-detached unit)
 - 10 no. House Type C (four-bed detached)
 - 16 no. House Type D (three-bed terraced unit)
 - 24 no. House Type E (four-bed semi-detached unit with attic conversion)
 - 6 no. House Type F (four-bed detached unit)
 - 50 no. House Type G (25 no. two-bed ground floor duplexes and 25 no. three-bed first/second floor duplexes)
 - 6 no. House Type H (two-bed apartments)
 - 12 no. house Type J (two-bed terrace)
2. Development of a crèche facility (206 sqm) and associated outdoor play areas and car parking.
3. Provision of a new site access from the North-South Oranmore Distributor Road (the route of which was permitted under An Bord Pleanála Reference PL 07.237219, which was extended under PI Ref 15/1334.
4. Provision of shared communal and private open space, site landscaping, site services and all associated site development works.

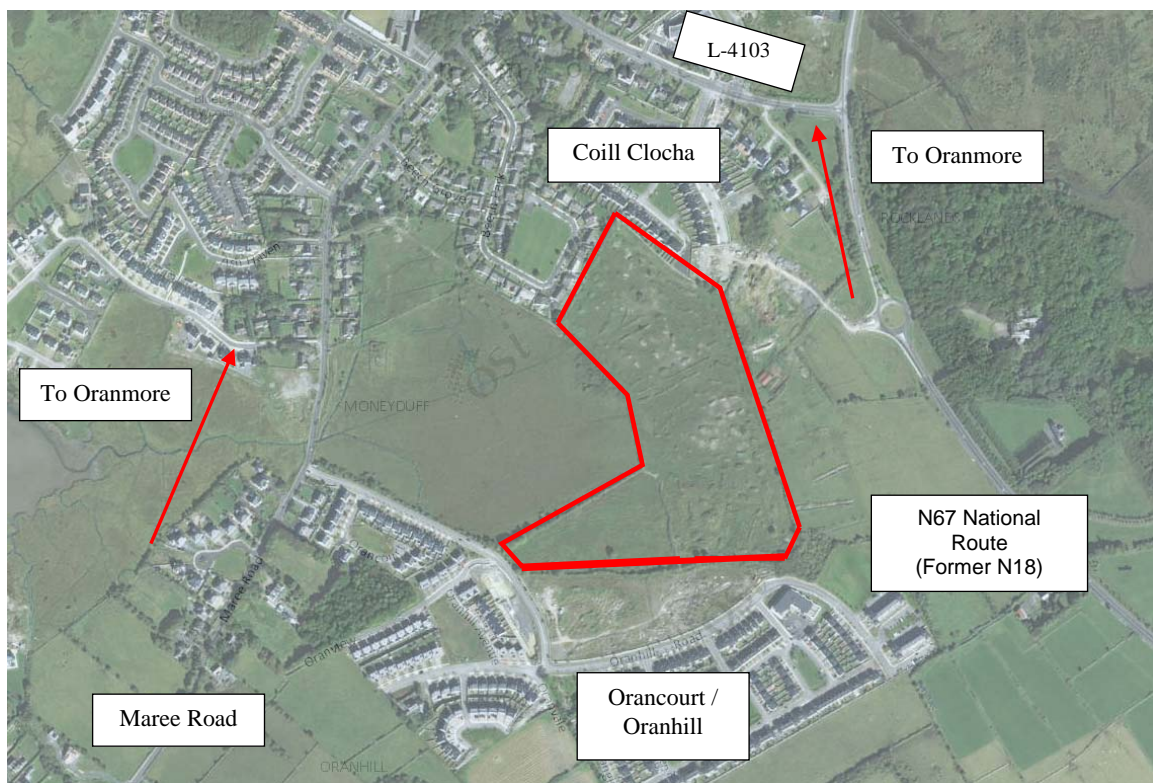
2 Road Network Infrastructure

2.1 EXISTING ROAD NETWORK INFRASTRUCTURE

The development site is a greenfield site located in Moneyduff, Oranmore in Co. Galway. The site is bounded to the East and West by existing greenfield sites, as detailed in Figure 2-1 below. The

site is also bounded by existing residential housing estates, Coill Clocha to the North and Orancourt/ Oranhill to the South.

To the east of the site is the N67 National Route (formerly the N18). An existing roundabout junction, known as the Rocklands junction, has previously been constructed to facilitate access to zoned lands. To the west, the Maree Road (local Road) serves access to the Orancourt/ Oranhill housing development. To the north, the L-4103 (Local Road) serves access from the N67 National Route, to Oranmore town centre and the Coill Clocha Housing Estate.



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Figure 2-1 Site Location

2.2 PROPOSED ROAD NETWORK INFRASTRUCTURE

Access to the proposed development is to be facilitated via the road infrastructure proposed as part of an adjoining committed development, as already permitted. The development, including the road network infrastructure, has previously been granted planning permission under Galway County Council (GCC) Planning Reference 09/1925 and as extended under GCC PR 15/1334.

The proposed road infrastructure of the adjacent development will comprise the construction of a New Link Road, from the existing road network infrastructure of the Coill Clocha Housing in the North, to the Orancourt / Oranhill Housing Estate in the South. In addition, a link road from the N67

Rocklands Roundabout Junction to the East is proposed across the adjacent greenfield site, to the applicant site, linking with the proposed North South Link Road as detailed in Figure 2-2 below.



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Figure 2-2 Proposed Road Network Infrastructure – GCC PR 09/1925 & 15/1334

Under Planning Reference 09/1925 and extended under PI Ref 15/1334, the proposed road network infrastructure was conditioned to include the upgrading of the proposals for the inclusion of dedicated Pedestrian and Cycle Facilities. This detail has been incorporated into the designs, with the detail submitted to Galway County Council as part of pre-development conditions under PI Ref 09/1925 and 15/1334 and confirmation of compliance received (GCC letter dated 21.06.2018).

3 Galway County Council Scoping

A meeting was held with Galway County Councils Roads Department on Friday 20th of January 2018 in relation to the requirements for:

- A Traffic and Transportation Report;
- A Road Safety Audit Report; and
- Mobility management Statement.

During the meeting it was advised that as the road infrastructure proposed under GCC PR 09/1925 (and extended under 15/1334) was designed to facilitate access to the development proposed under 09/1925, and to operate as a link road to serve traffic from the N67 National Route to the Maree Road (and future Development), that a requirement for a Traffic and Transportation Assessment would not be required. In lieu of a Traffic and Transportation Assessment, a statement with respect to the Traffic Volumes envisaged by the proposed Development should be included in the application.

GCC also advised that a Workplace Travel Plan Report would not be required for the proposed development. In Lieu of a Workplace travel Plan Report, a mobility management statement has been provided as outlined in section 8 of this report. A Road Safety Audit would be required for the proposed site layout, in accordance with the requirements of the Department of Transport, Tourism and Sports, Design Manual for Urban Roads and Streets. GCC advised that a Road Safety Audit of the road infrastructure proposed under GCC PR 09/1925 & 15/1334 would not be required in support of this SHD application.

Details of the proposed road infrastructure, including copies of the Road Safety Audit and the Traffic and Transportation Assessment undertaken in support of PR 09/1925 and 15/1334 are available from the Galway County Councils Planning Website.

4 Traffic Generation

TOBIN Consulting Engineers have procured TRICS data for similar sized residential developments in order to inform the trip rate associated with such a development. Details of the TRICS data utilised are included in Appendix A of this report.

Table 4-1 below details the applicable Trip Rate, and the associated generated traffic for the AM and PM peak hours.

TRAFFIC GENERATION							
AM Peak (08:00 – 09:00)				PM Peak (17:00 – 18:00)			
Arrivals Trip Rate Per Dwelling in AM Peak	Total No. Arrivals in AM Peak	Departures Trip Rate Per Dwelling in AM Peak	Total No. Departures in AM Peak	Arrivals Trip Rate Per Dwelling in PM Peak	Total No. Arrivals in PM Peak	Departures Trip Rate Per Dwelling in PM Peak	Total No. Departures in PM Peak
0.145	28	0.413	80	0.437	84	0.242	47

Table 4-1 Traffic Generation

The above table demonstrates that a total of 108 trip movements in the AM peak and a total of 131 trip movements in the PM peak are expected to result from the proposed development.

The strategic traffic counter (ref TMU N18 020.0 N) located on the N67 (formally N18) between Kilcolgan and Clarinbridge, Co. Galway has previously shown AADT's of 19,450 and 16,683 for the years 2016 and 2017 respectively. Since the new road M18 motorway opened in the September 2017, AADT's for the N18 has reduced by some 66% to 6617 for 2018.

It should be noted that the access to the adjacent development as permitted under 09/1925 and 15/1334 were granted under the conditions of the N67 at the time and prior to the opening of the M18 motorway. Therefore, due to the substantial reduction of traffic on the N67, the additional volumes of traffic proposed for the N67 generated from the proposed development will have a minimal effect on the traffic volumes.

5 Design Guidelines

The development is being developed in a manner which employs best practice in urban design and having regard to the following policy documents:

- Best Practice Guidelines for Delivering Homes Sustaining Communities 2007.
- Sustainable Residential Development in Urban Areas 2009.
- Sustainable Urban Housing: Design Standards for New Apartments 2015.
- Quality Housing for Sustainable Communities.
- Design Manual for Urban Roads and Streets.

As part of the road layout the design includes landscaping planters, increasing density, and ensuring greater contact with the surrounding areas can help create variety and improve the developments identity as an appropriate density homezone environment.

The use of narrow road profiles, paving stones, landscaping, etc. call for low vehicle speeds, benefiting the vulnerable user (*i.e.* roads should be there to serve a community - not to dominate it). The provision of good permeability for pedestrians, cyclists & public transport are all key objectives of the proposed site layout.

The objectives of the design are:

- To keep vehicle speeds low
- To minimise the intrusion of vehicle traffic
- To ensure ease of access for emergency services
- To encourage walking and cycling
- To create a safe, secure and pleasant environment for residents / users

Traffic calming measures included in design are:

- smaller corner radii
- horizontal alignment constraints to restrict speed
- Landscaping features
- Appropriate speed limits

6 Car & Bicycle Parking Provision

The parking provisions at the proposed development have been derived in accordance with the Galway County Development Plan 2015 – 2021. The development plan requires 1.5 no. parking spaces per 1-3 bedroom houses. This relates to 2 no. spaces per houses when provided on curtilage. The development plan requires 1 no. parking space per 4 no. children for the proposed crèche. The proposed crèche will allow for a capacity of 25 no. children and 5 no. staff.

The minimum number of parking spaces required for the proposed development, in line with the County Development Plan 2015 – 2021, is 371 while the actual number of parking spaces being provided throughout the proposed development is 383.

Secure cycle parking facilities are proposed throughout the proposed development to encourage non-motorised transport to and from the site. In accordance with section 5.7.7 of the National Cycle Manual, 2 no. spaces are to be provided per terrace and duplex units. Bicycle parking provisions for detached and semi-detached shall be in their individual private open spaces.

The minimum number of bicycle parking spaces required for the proposed development, in line with the national Cycle Manual, is 146 and the actual number of parking spaces being provided throughout the proposed development is 146.

7 Road Safety

A road safety audit has been carried out by RSM independently from the design team on the proposed development. Several iterations of the site layout have been carried out by the design team on the back of continued liaison and outcomes of the road safety audit. As a result, the final site layout provides a roads network throughout the development which incorporates measures (such as curved alignments, surface materials to differentiate pedestrian and vehicle routes etc.) that ultimately provide a high level of safety for both the pedestrian and the driver without comprising the overall quality of the development.

Please refer to the RSM Road Safety Audit included as part of this submission for further details.

8 Mobility Management Statement

8.1 Introduction

TOBIN Consulting Engineers were appointed by Arlum Ltd. to provide design consultancy services for a new Residential Development at Moneyduff, Oranmore Co. Galway in December 2017. As part of these services, TOBIN were required to provide a Mobility Management Statement for the proposed residential development at Moneyduff, Oranmore.

The purpose of the Mobility Management Statement is to promote sustainable transport for places of work and to encourage a shift in workers using private cars to other modes of transport.

Once the proposed development is completed and the dwellings are occupied, the mobility statement will provide the platform for investigating the commuting patterns of the residents. It is envisaged that the occupants of the development will benefit from healthier commutes to works, reduced congestion within the site, a reduction in demand for parking spaces and more informed travel options for the residents and visitors. Figure 8.1 below illustrates the local amenities and transport connections in the Oranmore vicinity.

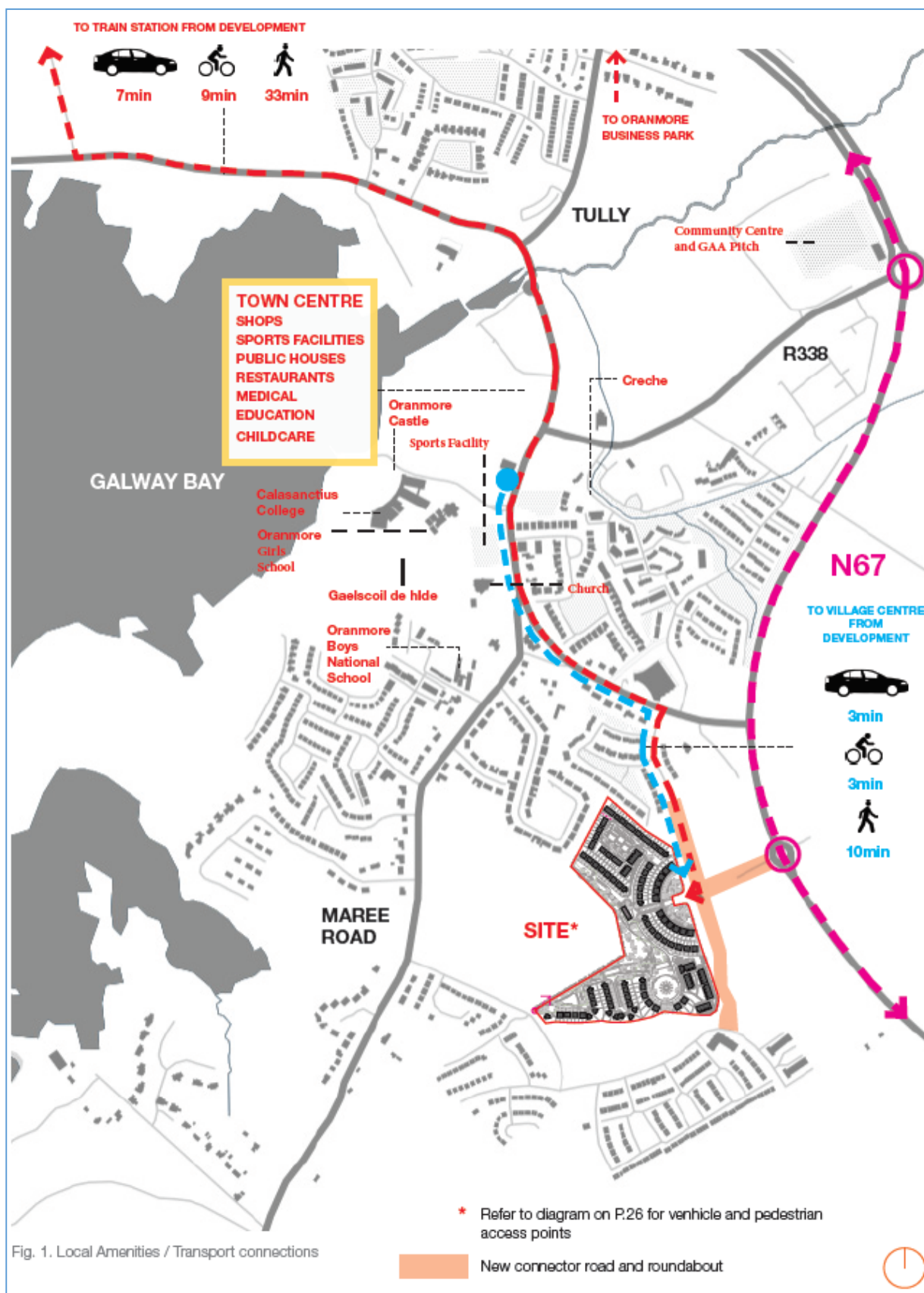


Fig 8.1 – local Amenities and Connection Routes

8.2 Walking

A network of footpaths throughout the proposed development will provide a high rate of accessibility to the local facilities with the town of Oranmore. The inclusion of these attractive, well designed walking routes will encourage pedestrians to access the local facilities on foot as opposed to taking their personal vehicles.

Oranmore village is located to the north of the proposed development. Pedestrian access to the village centre shall be via the network of proposed footways within the proposed development, the link road adjoining the proposed development and the Coill Clocha development and the existing footways on the approach to Oranmore village itself.

Pedestrian routes from the proposed development to the Oranmore town centre will be 1.00km in length and will take the average pedestrian 10 min to walk. Amenities in and around the town centre include local primary and secondary schools, shops, restaurants (refer to Fig 8.1).

The development is within 10min walk to the nearest bus stop which is located opposite the Oran town centre. The bus route 404 operated by Bus Eireann serves this location and provides a route into Galway City every 60 mins. The duration of the trip to Galway city centre is approx 30 mins with the bus availing of several bus lanes along the route.

It is proposed to provide a network of footpaths that will permeate through the residential area and provide a high degree of accessibility to the local facilities including bus and rail transport.



Fig 8.2 – Pedestrian routes through Site and routes to local amenities

8.3 Cycling

A shared cycle and vehicle surface shall be provided within the proposed development in line with DMURS 2013 guidelines. For commuter journeys, cycling can be considered as a feasible means of transport for those working within 8 km of the development. The Oranmore Business Park and Deerpark Industrial Estates are located approximately 3.1 km to the north. This represents a 10 to 15 min cycle time for the average cyclist from the proposed estate.

Additionally, the Oranmore rail station is approximately 3.0km to the North West. It is likely that a number of commuters to Galway City will use a combination of rail and cycling as a means of travelling. Cycling enthusiasts and regular cyclists will likely cycle further distance such a Galway City centre and Parkmore and Briar hill Industrial estates.

The Bike to Work scheme currently being promoted by the Government allows employers to purchase bicycles for up to the value of €1,000.00. Employees can use a salary sacrifice to pay for the bike allowing them to save up to 52% on the retail price of the bike. It is likely that this attractive option will be availed of by homeowners in the proposed development as the site is located in close proximity to several areas of where a high number of employers are located.

8.4 Public transport

The proposed residential development in Moneyduff is well connected to a number of means of public transport. The Oranmore rail station is located 3.0km to the north. The station is located on the main Galway to Athenry/Dublin line. A new carpark is located adjacent to the rail station. Currently there is no bus stop located at the rail station, however, it is possible that a stop on the 404 bus route may include a new stop at this location.

The development is within 12min and 19min walk to the nearest bus stop which is located opposite the Oran town centre. The bus route 404 operated by Bus Eireann serves this location and provides a route into Galway City every 60 mins. The duration of the trip to Galway city centre is approx 30 mins with the bus availing of several bus lanes along the route.



Fig 8.2 – Location of Rail and Bus stops

9 Conclusion

As population grows throughout Ireland and in particular, in popular commuting hub towns like Oranmore, a continued increase in traffic volumes is not sustainable. As a result, an ever-increasing approach by designers and planners to providing sustainable commuting alternatives is required. The use of public transport and promotion of walking and cycling will ultimately increase the overall quality of life for the people living in these fast paced, busy towns and villages located within commuter belts.

The proposed development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2013 and the National cycle Manual, which promotes the use of sustainable travel to and from the site. The Road safety audit carried out for the site allowed the design team to address any concerns initially flagged in the road safety audit. A continued and collaborative approach with the road safety auditors meant that a desirable and safe site layout could be achieved without negatively impacting the overall quality of the development.

The use of the private car will still be maintained as a primary mode of transport for a number the residents in the development. Trip generations to and from the proposed development are 108 in

the morning peak and 131 in the evening peak as noted in section 4 of this report. The internal roads on the development and the permitted link roads to be constructed adjoining the N67 and the development have been suitably designed in accordance with the DMURS manual. Progressive and regular liaison with Galway County Council Roads Department in relation to the internal roads and the permitted link roads layouts contributed to the final road design for the development.

The proposed development is suitably located close to a number of amenities located in the town of Oranmore including, schools, shops, sports facilities etc. The majority of these amenities are within a 10 min walk of the proposed development. The area of Oranmore also offers an excellent variety of public transport option with the nearest bus stop 10 min walk and has connections to Galway city. Additionally, the Oranmore rail station is approximately 7 min drive or 33 min walk from the proposed Development. The rail line is an attractive option for commuters to Galway City due to its strict departing schedule and the extremely low risk of delays when compared with road users who often suffer delays due traffic congestion.

It should be noted that due to the significant reduction in traffic volumes on the N67 since September 2017, as a result of the opening of the new M18 motorway, any increase in volumes on the N67 as a result of the proposed development will not have a significant impact.

APPENDIX A

TRICS Data

Filtering Summary

Land Use	03/A	RESIDENTIAL/HOUSES PRIVATELY OWNED
Selected Trip Rate Calculation Parameter Range	150-300 DWELLS	
Actual Trip Rate Calculation Parameter Range	151-280 DWELLS	
Date Range	Minimum: 01/01/06	Maximum: 12/10/16
Days of the week selected	Monday	1
	Tuesday	4
	Wednesday	1
	Thursday	1
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	2
	Edge of Town	5
Population <1 Mile ranges selected	1,001 to 5,000	2
	10,001 to 15,000	3
	15,001 to 20,000	1
	20,001 to 25,000	1
Population <5 Mile ranges selected	5,001 to 25,000	1
	50,001 to 75,000	3
	75,001 to 100,000	3
Car Ownership <5 Mile ranges selected	0.6 to 1.0	2
	1.1 to 1.5	4
	1.6 to 2.0	1
PTAL Rating	No PTAL Present	7

Calculation Reference: AUDIT-700101-180226-0208

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	WS WEST SUSSEX	1 days
11	SCOTLAND	
	FI FIFE	1 days
12	CONNAUGHT	
	GA GALWAY	1 days
13	MUNSTER	
	WA WATERFORD	1 days
17	ULSTER (NORTHERN IRELAND)	
	AN ANTRIM	2 days
	AR ARMAGH	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
 Actual Range: 151 to 280 (units:)
 Range Selected by User: 150 to 300 (units:)

Public Transport Provision:

Selection by: Monday-Friday 0700-1900
 Include days where PT not known: Yes
 Range: 9 to 250

Date Range: 01/01/06 to 12/10/16

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	4 days
Wednesday	1 days
Thursday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	6
No Sub Category	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C3	7 days
----	--------

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	2 days
10,001 to 15,000	3 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
50,001 to 75,000	3 days
75,001 to 100,000	3 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	4 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	6 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	7 days
-----------------	--------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

Site(1):	AN-03-A-08	Site area:	8.68 hect
Development Name:	HOUSES & FLATS	Number of dwellings:	204
Location:	LISBURN	Housing density:	26
Postcode:	BT28 2WP	Total Bedrooms:	598
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	29/10/13
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	430
Site(2):	AN-03-A-09	Site area:	9.48 hect
Development Name:	DETACHED & SEMI-DETACHED	Number of dwellings:	151
Location:	CARRICKFERGUS	Housing density:	18
Postcode:	BT38 8FW	Total Bedrooms:	459
Main Location Type:	Edge of Town	Survey Date:	12/10/16
Sub-Location Type:	No Sub Category	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	457
Site(3):	AR-03-A-01	Site area:	4.04 hect
Development Name:	MIXED HOUSES	Number of dwellings:	153
Location:	LURGAN	Housing density:	38
Postcode:	BT66 7SY	Total Bedrooms:	482
Main Location Type:	Edge of Town	Survey Date:	15/06/10
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	311
Site(4):	FI-03-A-03	Site area:	7.50 hect
Development Name:	MIXED HOUSES	Number of dwellings:	155
Location:	DUNFERMLINE	Housing density:	25
Postcode:		Total Bedrooms:	447
Main Location Type:	Edge of Town	Survey Date:	30/04/07
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	440
Site(5):	GA-03-A-02	Site area:	7.00 hect
Development Name:	TERRACED	Number of dwellings:	185
Location:	GALWAY	Housing density:	31
Postcode:		Total Bedrooms:	393
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	19/09/06
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	230
Site(6):	WA-03-A-04	Site area:	28.59 hect
Development Name:	DETACHED	Number of dwellings:	280
Location:	WATERFORD	Housing density:	12
Postcode:		Total Bedrooms:	1130
Main Location Type:	Edge of Town	Survey Date:	24/06/14
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	982
Site(7):	WS-03-A-04	Site area:	5.45 hect
Development Name:	MIXED HOUSES	Number of dwellings:	151
Location:	HORSHAM	Housing density:	46
Postcode:	RH12 1EP	Total Bedrooms:	465
Main Location Type:	Edge of Town	Survey Date:	11/12/14
Sub-Location Type:	Residential Zone	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	345

Trip Rates for Key Periods		Trips per 1 dwells DWELLS	
Period	Inbound	Outbound	Total
0800-0900	0.145	0.413	0.558
1700-1800	0.437	0.242	0.679

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	183	0.048	7	183	0.248	7	183	0.296
08:00 - 09:00	7	183	0.145	7	183	0.413	7	183	0.558
09:00 - 10:00	7	183	0.169	7	183	0.228	7	183	0.397
10:00 - 11:00	7	183	0.142	7	183	0.174	7	183	0.316
11:00 - 12:00	7	183	0.140	7	183	0.167	7	183	0.307
12:00 - 13:00	7	183	0.215	7	183	0.176	7	183	0.391
13:00 - 14:00	7	183	0.210	7	183	0.230	7	183	0.440
14:00 - 15:00	7	183	0.231	7	183	0.232	7	183	0.463
15:00 - 16:00	7	183	0.272	7	183	0.201	7	183	0.473
16:00 - 17:00	7	183	0.314	7	183	0.196	7	183	0.510
17:00 - 18:00	7	183	0.437	7	183	0.242	7	183	0.679
18:00 - 19:00	7	183	0.307	7	183	0.250	7	183	0.557
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:	2.630			2.757			5.387		

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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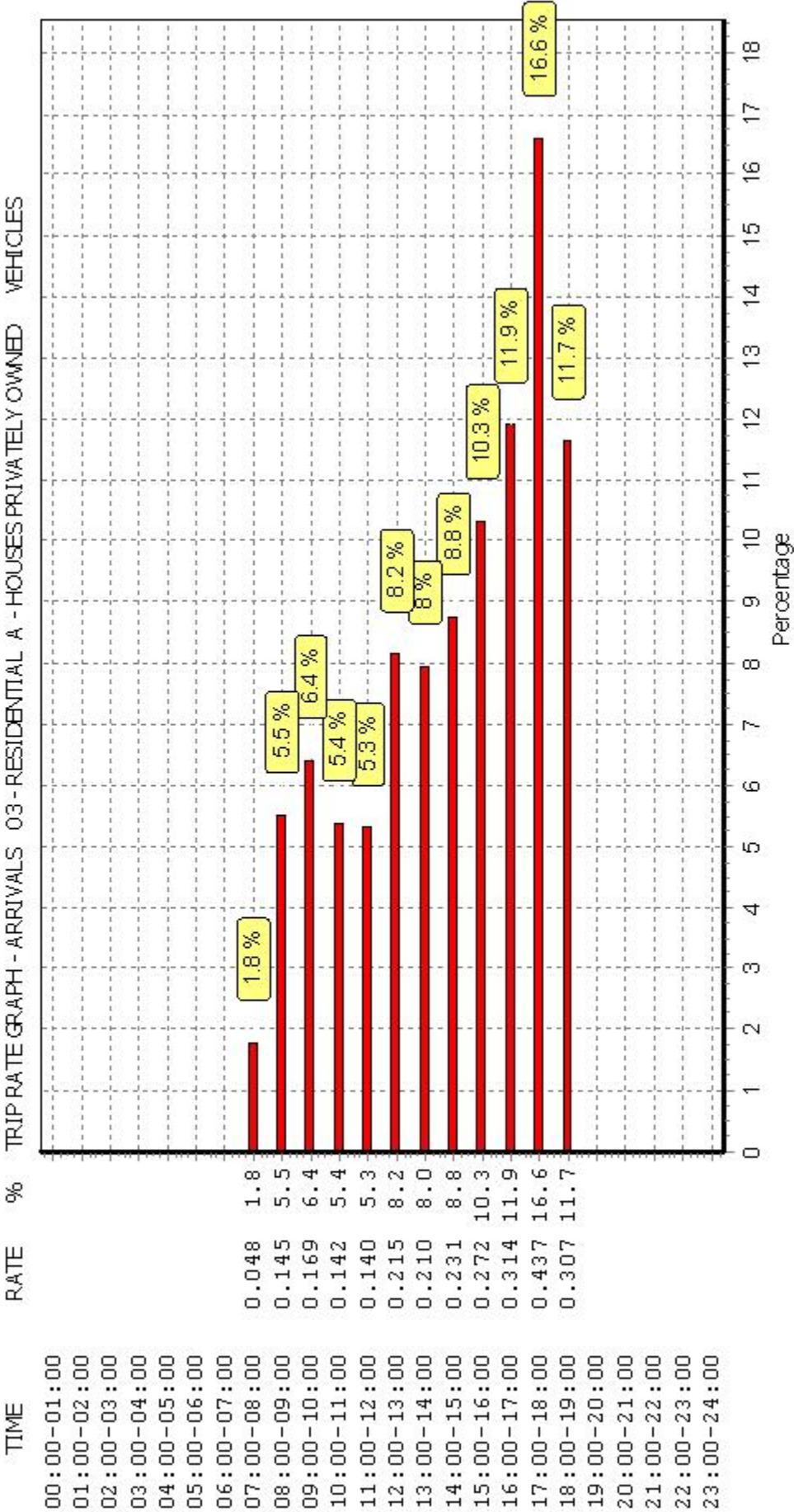
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Parameter summary

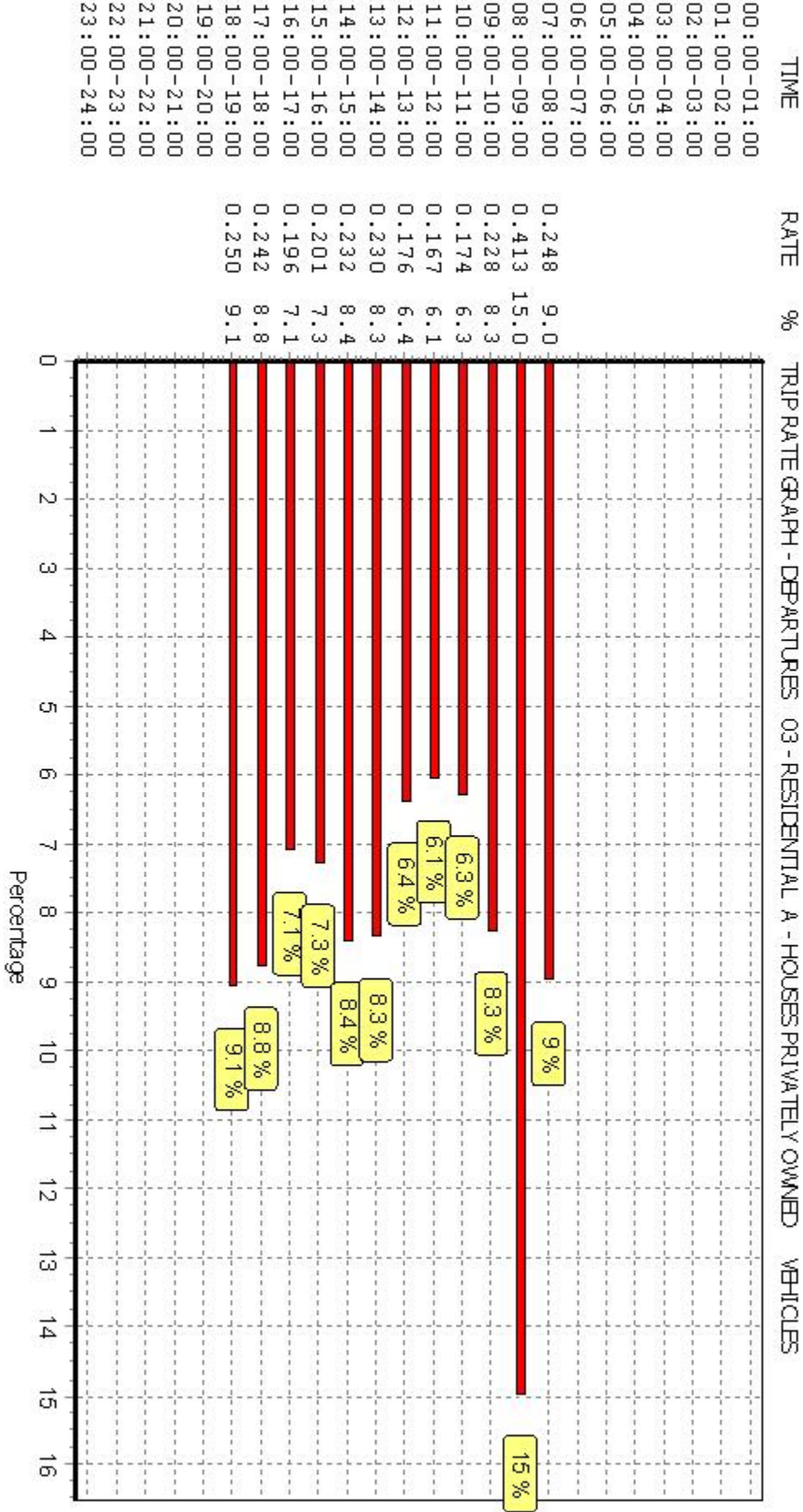
Trip rate parameter range selected:	151 - 280 (units:)
Survey date date range:	01/01/06 - 12/10/16
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

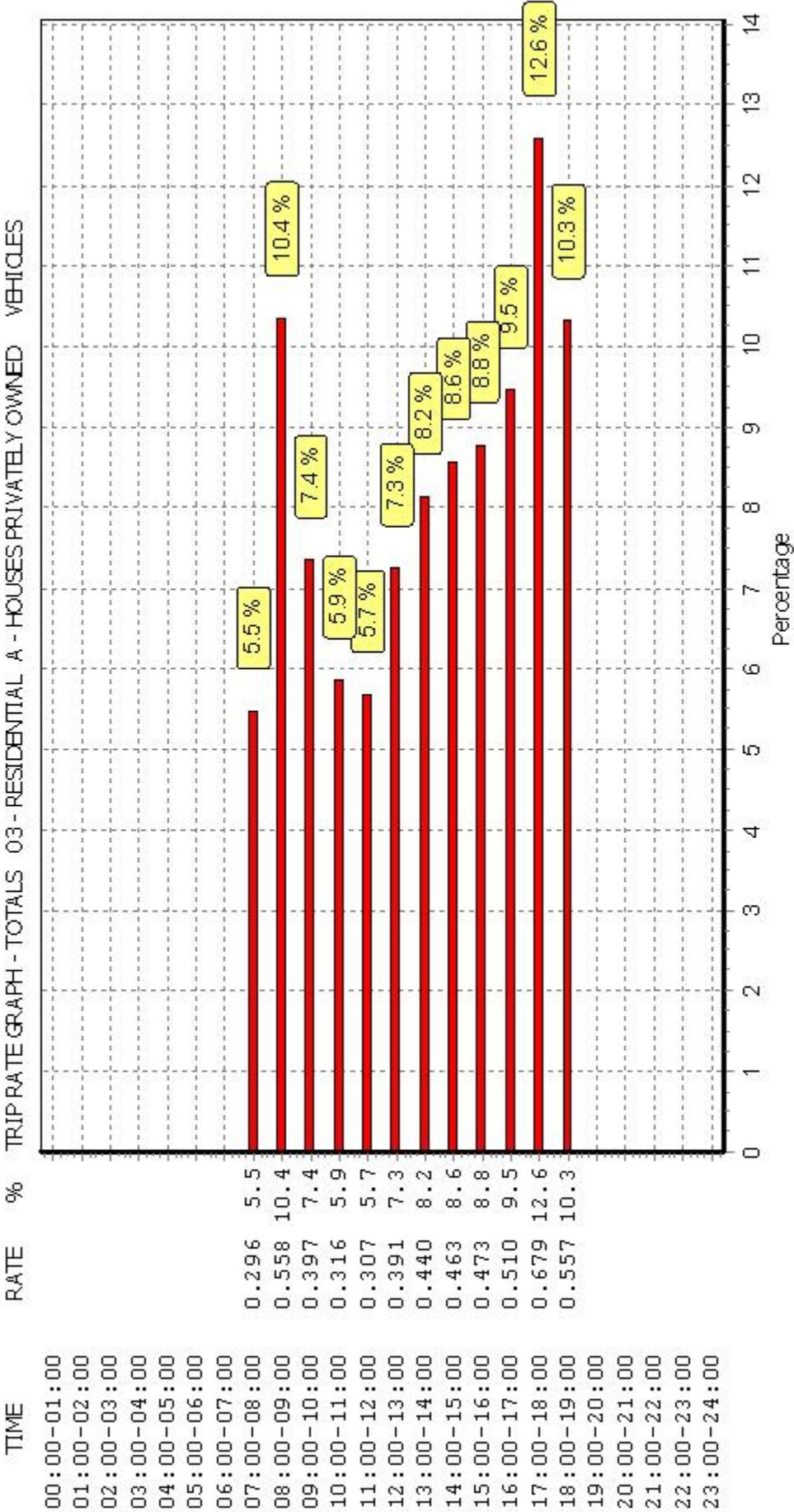
Licence No: 700101



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

TAXIS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	183	0.004	7	183	0.004	7	183	0.008
08:00 - 09:00	7	183	0.005	7	183	0.006	7	183	0.011
09:00 - 10:00	7	183	0.002	7	183	0.002	7	183	0.004
10:00 - 11:00	7	183	0.001	7	183	0.001	7	183	0.002
11:00 - 12:00	7	183	0.005	7	183	0.004	7	183	0.009
12:00 - 13:00	7	183	0.002	7	183	0.002	7	183	0.004
13:00 - 14:00	7	183	0.005	7	183	0.004	7	183	0.009
14:00 - 15:00	7	183	0.006	7	183	0.007	7	183	0.013
15:00 - 16:00	7	183	0.009	7	183	0.007	7	183	0.016
16:00 - 17:00	7	183	0.004	7	183	0.007	7	183	0.011
17:00 - 18:00	7	183	0.004	7	183	0.003	7	183	0.007
18:00 - 19:00	7	183	0.004	7	183	0.005	7	183	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.051			0.052			0.103

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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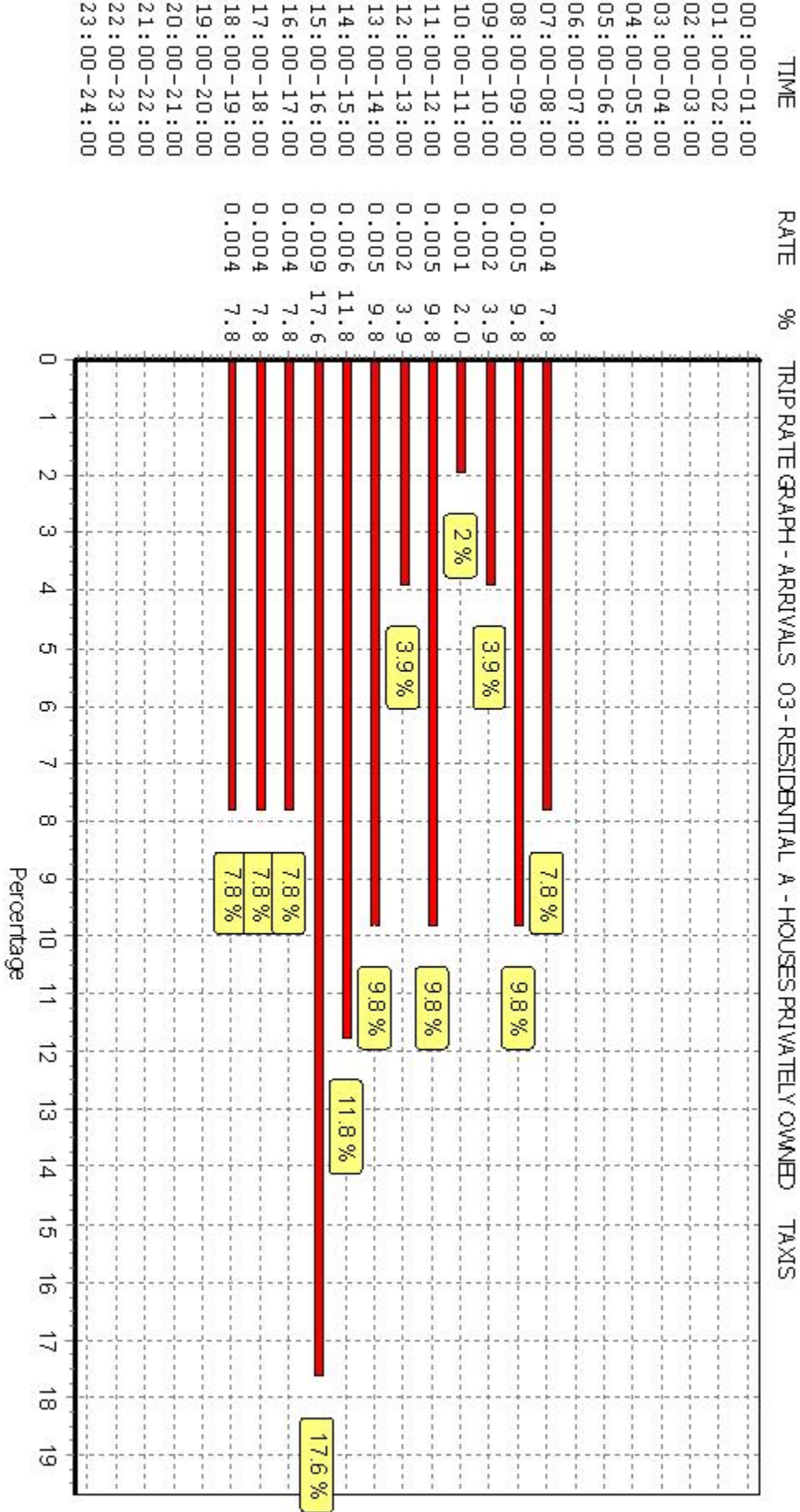
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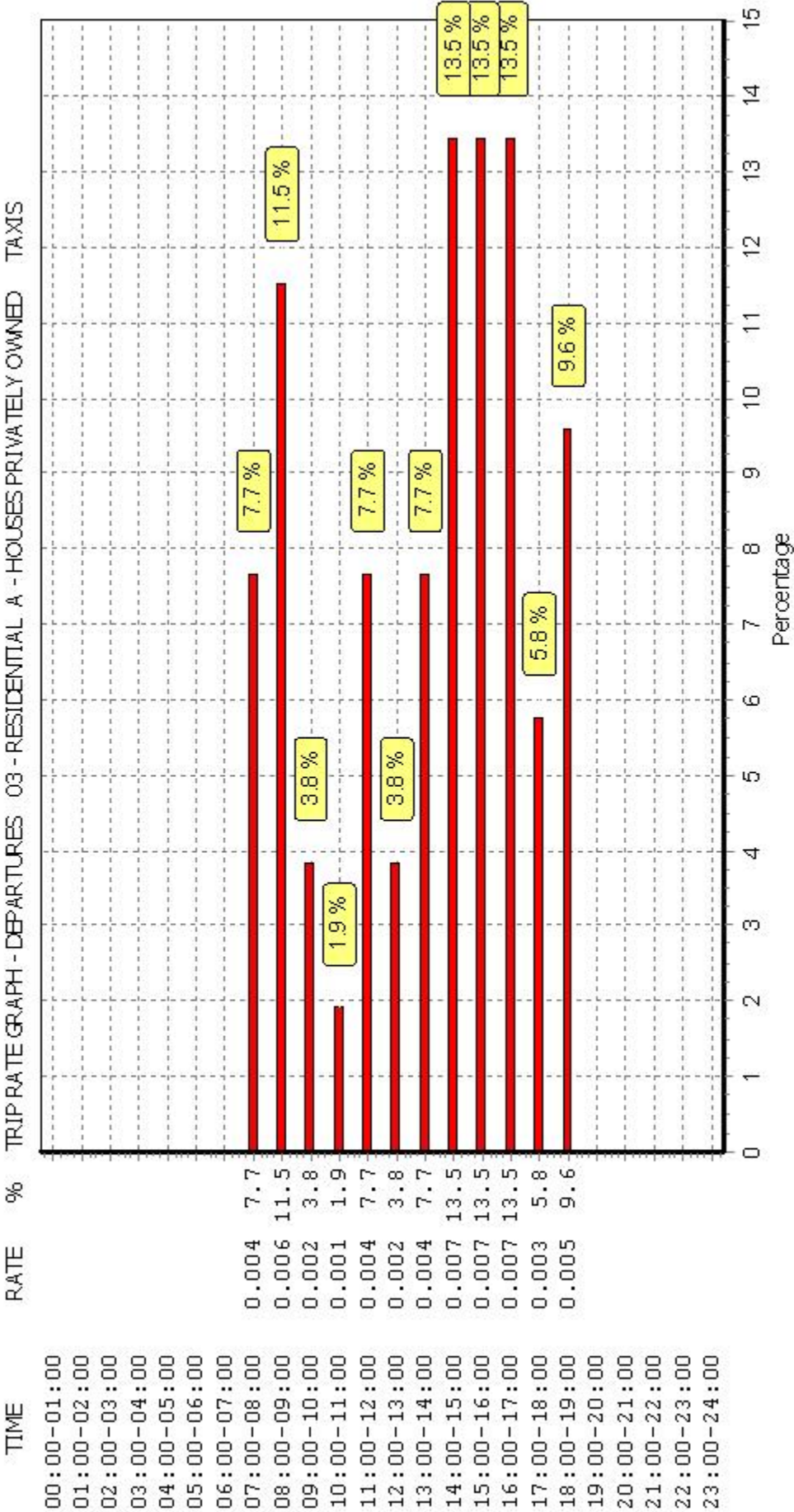
Parameter summary

Trip rate parameter range selected:	151 - 280 (units:)
Survey date date range:	01/01/06 - 12/10/16
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

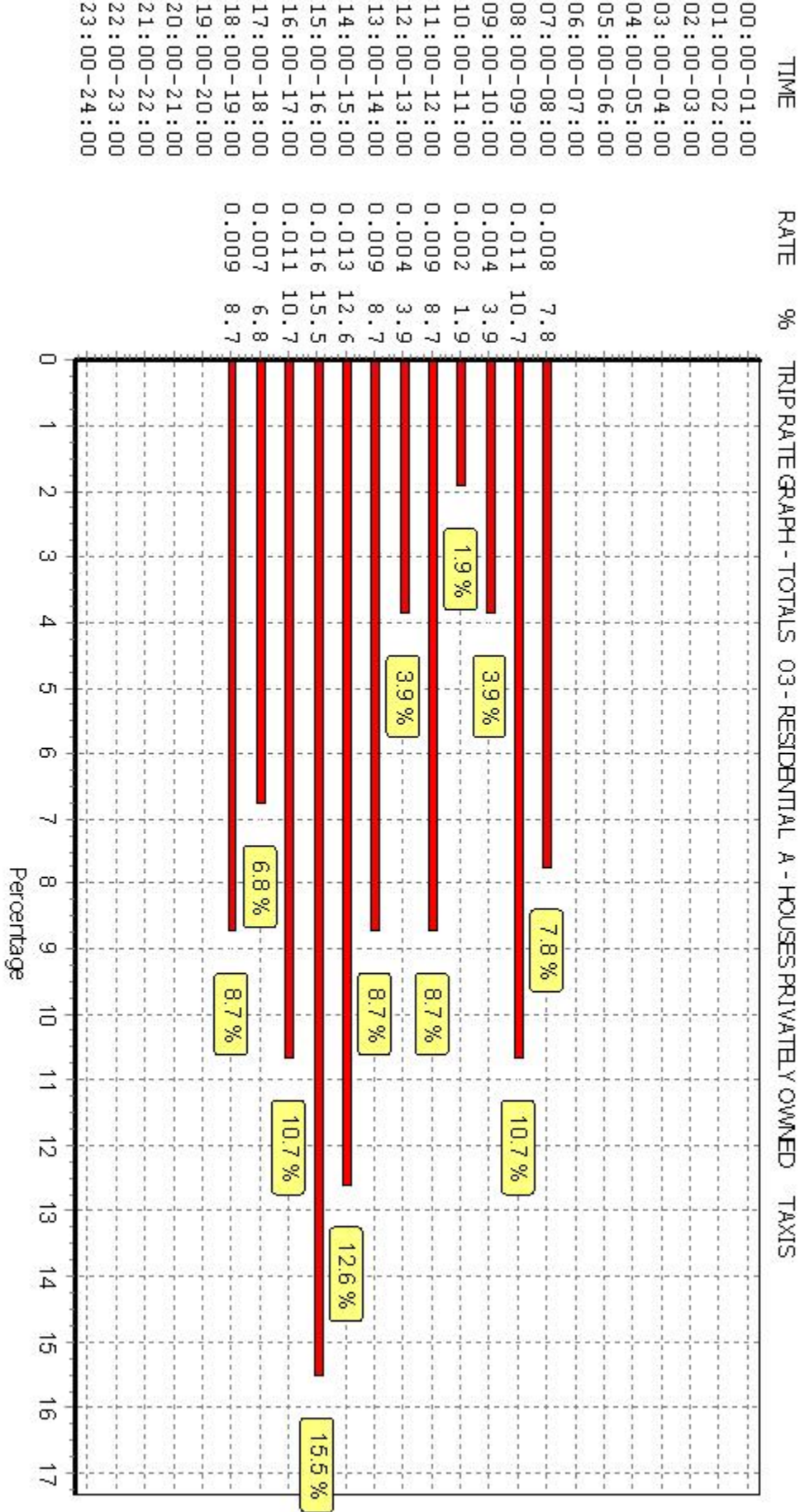
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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

OGVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	183	0.000	7	183	0.001	7	183	0.001
08:00 - 09:00	7	183	0.004	7	183	0.002	7	183	0.006
09:00 - 10:00	7	183	0.005	7	183	0.003	7	183	0.008
10:00 - 11:00	7	183	0.003	7	183	0.004	7	183	0.007
11:00 - 12:00	7	183	0.004	7	183	0.003	7	183	0.007
12:00 - 13:00	7	183	0.002	7	183	0.004	7	183	0.006
13:00 - 14:00	7	183	0.001	7	183	0.001	7	183	0.002
14:00 - 15:00	7	183	0.002	7	183	0.002	7	183	0.004
15:00 - 16:00	7	183	0.002	7	183	0.002	7	183	0.004
16:00 - 17:00	7	183	0.000	7	183	0.000	7	183	0.000
17:00 - 18:00	7	183	0.000	7	183	0.000	7	183	0.000
18:00 - 19:00	7	183	0.002	7	183	0.002	7	183	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.025			0.024			0.049

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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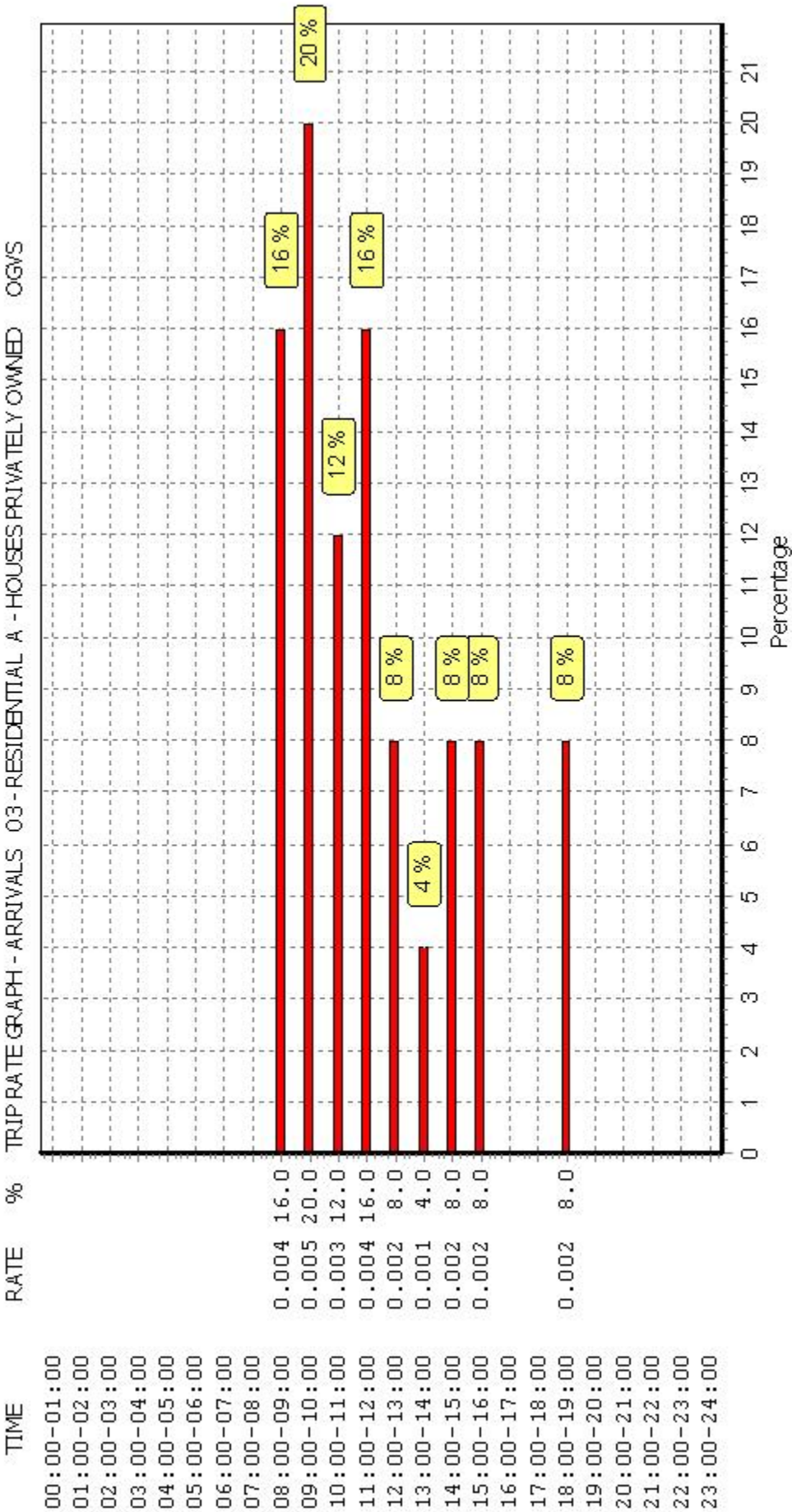
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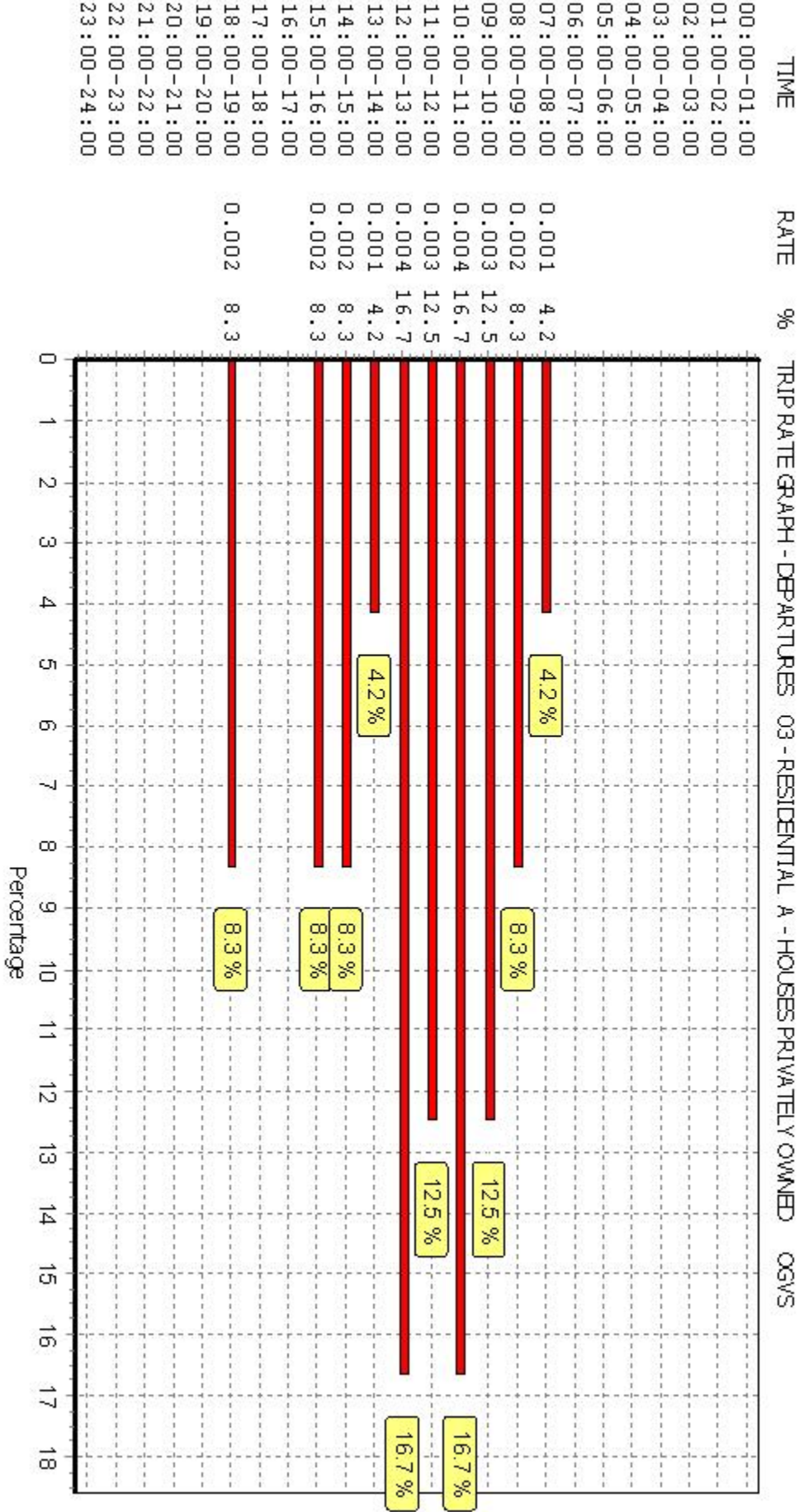
Parameter summary

Trip rate parameter range selected:	151 - 280 (units:)
Survey date date range:	01/01/06 - 12/10/16
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

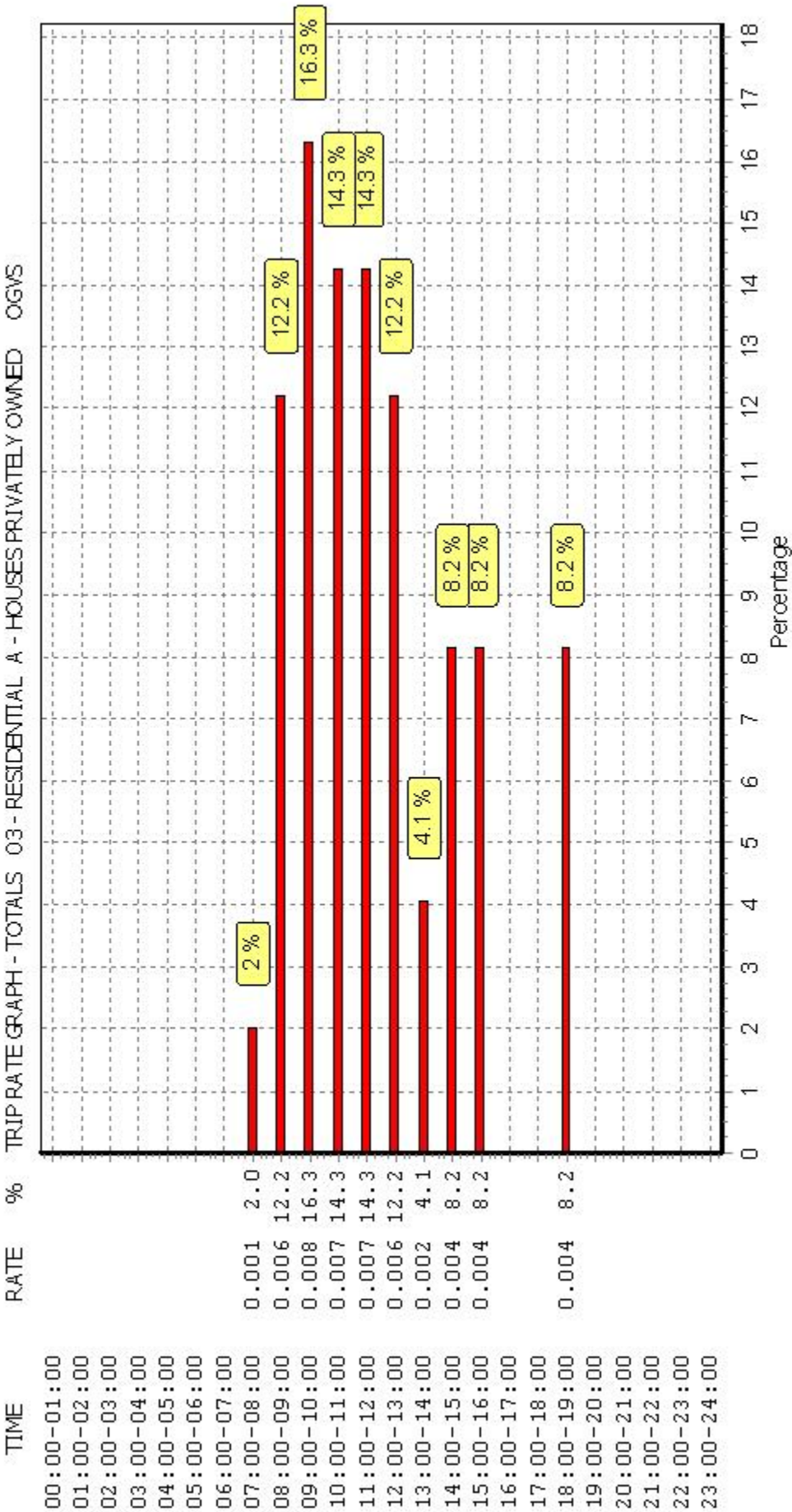
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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

PSVS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	183	0.000	7	183	0.000	7	183	0.000
08:00 - 09:00	7	183	0.005	7	183	0.005	7	183	0.010
09:00 - 10:00	7	183	0.000	7	183	0.001	7	183	0.001
10:00 - 11:00	7	183	0.000	7	183	0.000	7	183	0.000
11:00 - 12:00	7	183	0.000	7	183	0.000	7	183	0.000
12:00 - 13:00	7	183	0.000	7	183	0.000	7	183	0.000
13:00 - 14:00	7	183	0.000	7	183	0.000	7	183	0.000
14:00 - 15:00	7	183	0.002	7	183	0.001	7	183	0.003
15:00 - 16:00	7	183	0.002	7	183	0.002	7	183	0.004
16:00 - 17:00	7	183	0.000	7	183	0.001	7	183	0.001
17:00 - 18:00	7	183	0.001	7	183	0.000	7	183	0.001
18:00 - 19:00	7	183	0.001	7	183	0.001	7	183	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.011			0.011			0.022

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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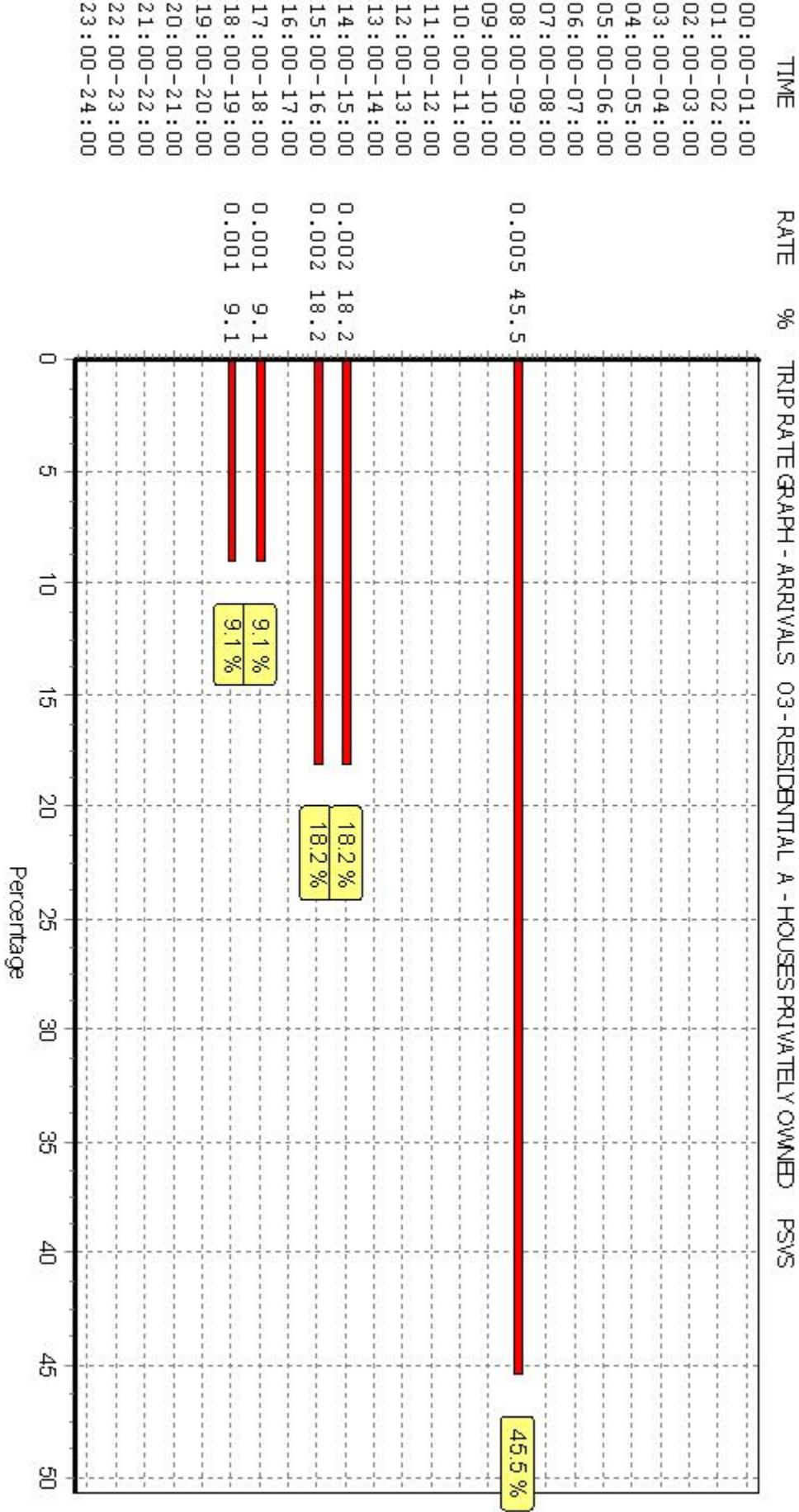
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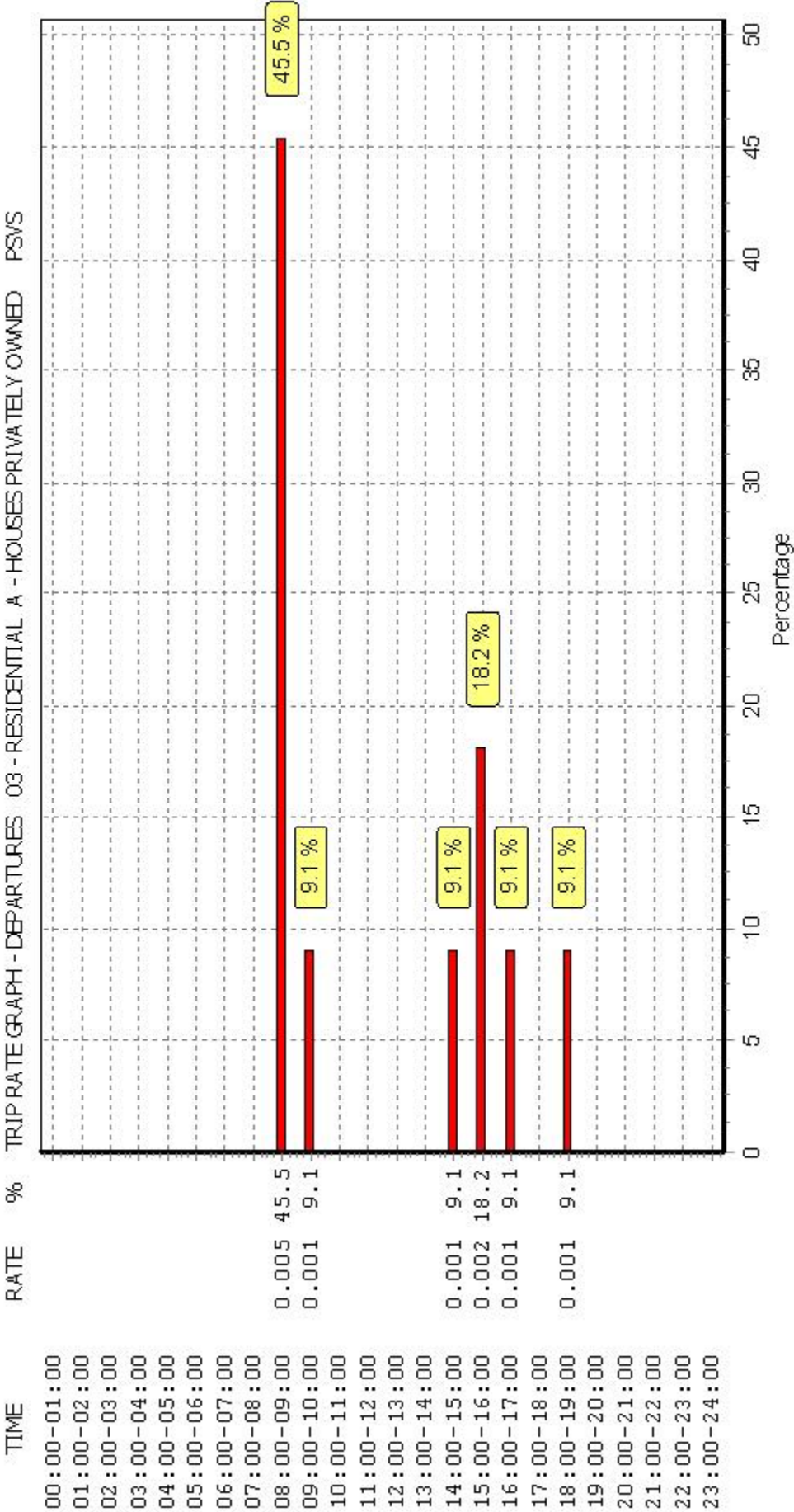
Parameter summary

Trip rate parameter range selected:	151 - 280 (units:)
Survey date date range:	01/01/06 - 12/10/16
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

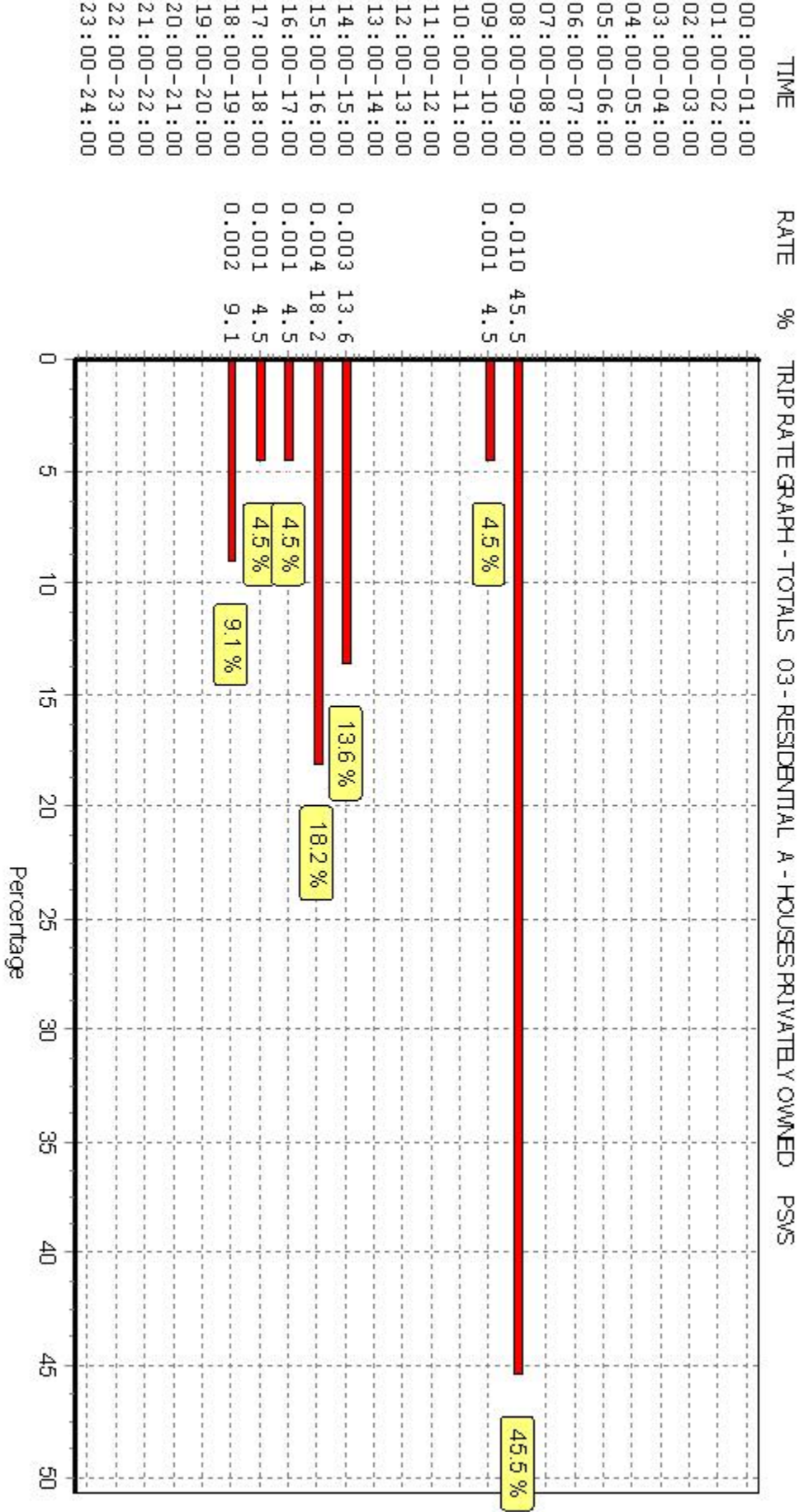
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TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	183	0.002	7	183	0.004	7	183	0.006
08:00 - 09:00	7	183	0.002	7	183	0.013	7	183	0.015
09:00 - 10:00	7	183	0.005	7	183	0.006	7	183	0.011
10:00 - 11:00	7	183	0.004	7	183	0.008	7	183	0.012
11:00 - 12:00	7	183	0.005	7	183	0.002	7	183	0.007
12:00 - 13:00	7	183	0.008	7	183	0.005	7	183	0.013
13:00 - 14:00	7	183	0.004	7	183	0.006	7	183	0.010
14:00 - 15:00	7	183	0.003	7	183	0.004	7	183	0.007
15:00 - 16:00	7	183	0.013	7	183	0.005	7	183	0.018
16:00 - 17:00	7	183	0.007	7	183	0.009	7	183	0.016
17:00 - 18:00	7	183	0.009	7	183	0.009	7	183	0.018
18:00 - 19:00	7	183	0.005	7	183	0.004	7	183	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:	0.067			0.075			0.142		

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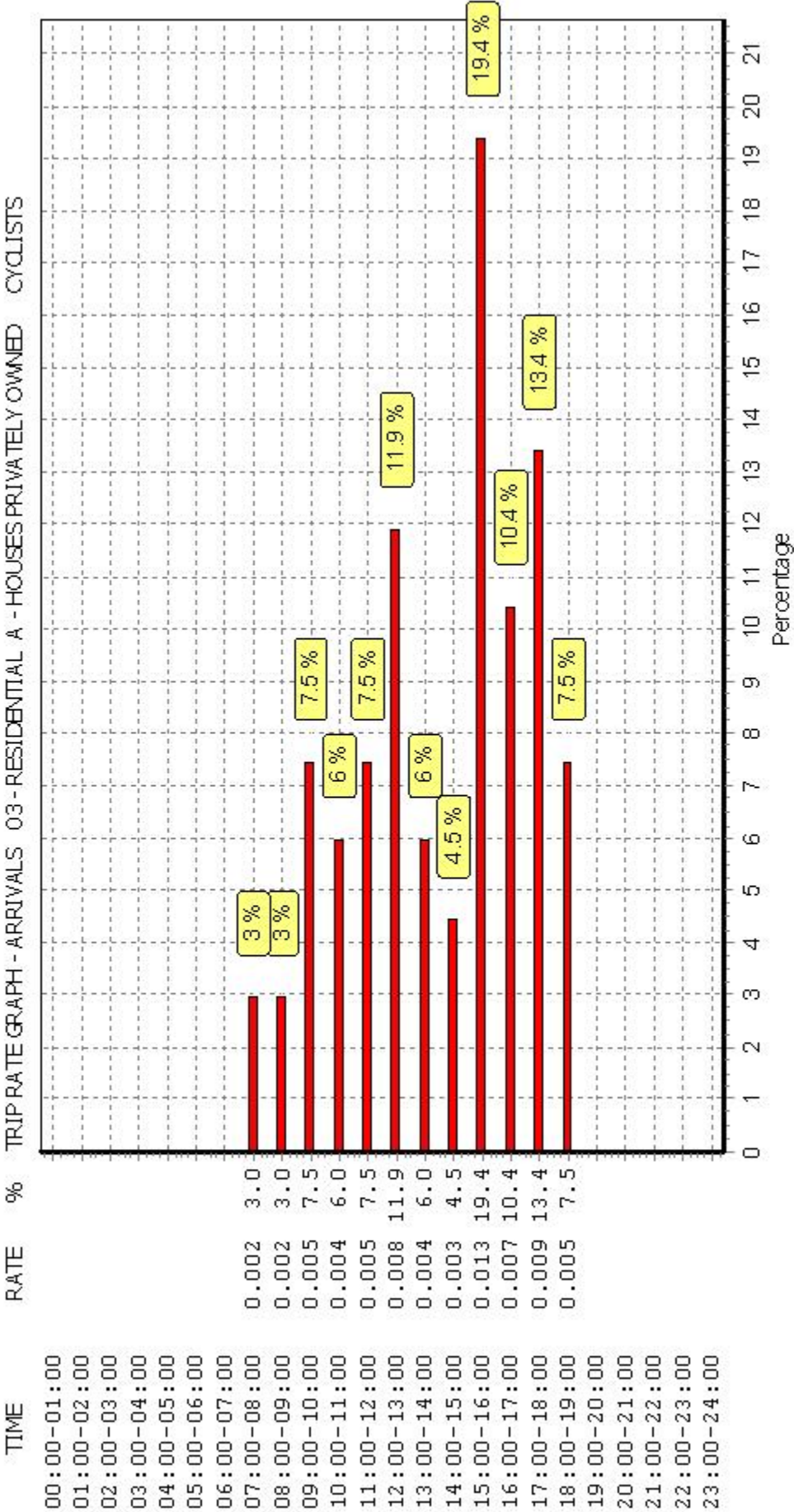
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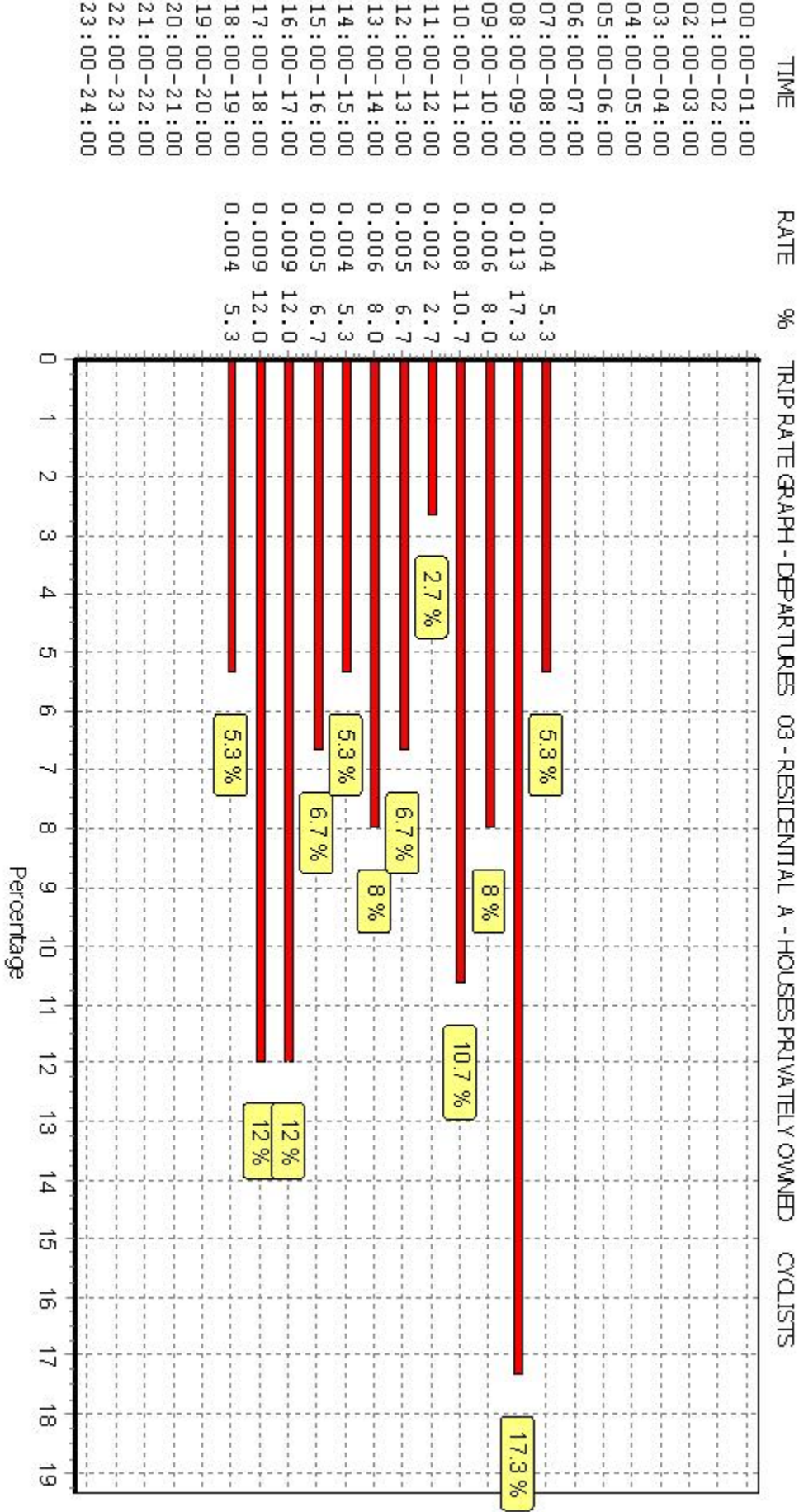
Parameter summary

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Survey date date range:	01/01/06 - 12/10/16
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

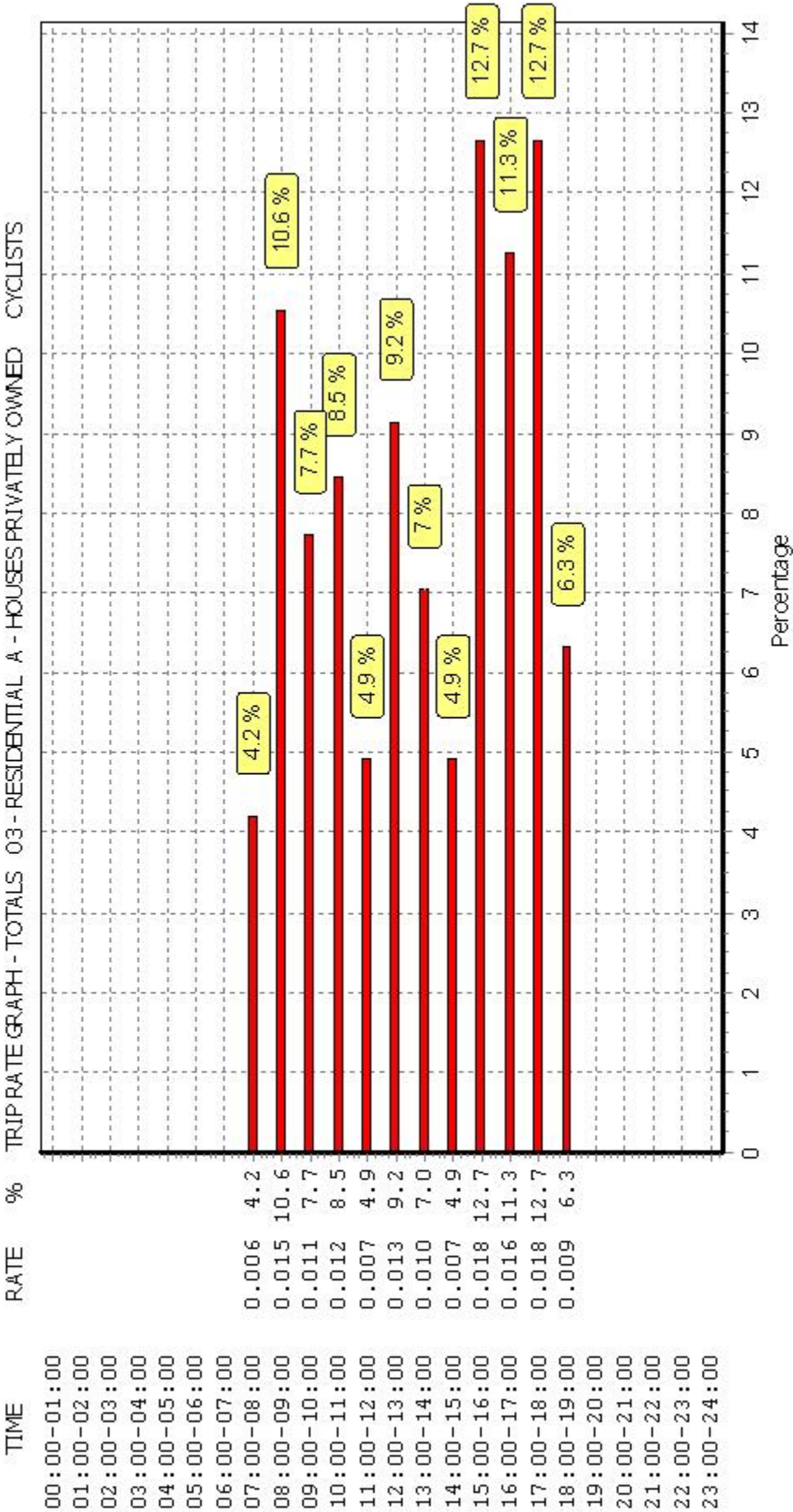
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NATIONAL NETWORK

Appendix 12-2

RSM Road Safety Audit

Road Safety Audit

Stage 1/2

for

MONEYDUFF HOUSING DEVELOPMENT

AT

ORANMORE, Co GALWAY

Date: April 2019

Report produced for: TOBIN Consulting Engineers

Report produced by: Road Safety Matters

Reference: RSM/MOB/090318/MONEYDUFFRSA1-2

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DOCUMENT CONTROL SHEET

Client	TOBIN Consulting Engineers
Project Title	Moneyduff Housing Development, Oranmore, Co Galway
Document Title	Stage 1/2 Road Safety Audit
Document Ref.	RSM/MOB/090318/MONEYDUFFRSA1-2
Status	Final – Note Previous Report Updated for New Application

Record of Issue

Rev	Originator	Team Member	Date	Distribution
DRAFT 1	M O' B	AJS	22/5/18	Brendan Rudden, TOBIN Consulting Engineers
FINAL	M O' B	AJS	13/6/18	Brendan Rudden, TOBIN Consulting Engineers
FINAL RE-LODGE	M O' B	AJS	4/4/19	Brendan Rudden, TOBIN Consulting Engineers

BACKGROUND INFORMATION

The report which follows is the Road Safety Audit - Stage 1/2 for access to a proposed residential development to the west of the N67 (old N18) in Oranmore, Co Galway, based on the information supplied to the RSA Team as detailed below. The scheme will involve construction of a creche and residential dwellings accessed via a network of internal roads and junctions, along with parking and all associated ancillary services.

Table 1: Information Supplied

Item		Supplied	Comment
A	Plans / Drawings	Y	10402-2005_C-Proposed Roads Layouts
			10402-2006_C-Proposed Roads Layouts
			10402-2017_B-Lighting Layout
			10402-2018_B-Autotrack Layout Refuse Vehicle
			10402-2019_B-Autotrack Layout Large Car
			10402-2020_B-Autotrack Layout Fire Truck
			10402-2014_A-Site Location Map
			House Type C-2325-P 027
			House Type F Curtilage-2325-P-018
			House Types A and B-Layout2
			House Types D and J-Layout2
			2325-P-025 Uncontrolled Pedestrian Crossing Detail-2325-P-025
			2325-P-026 Boundary Treatment Plan-2325-P-026
			2325-P-031-032 Home Zone +Duplex garden-2325-P-031
			10402 Moneyduff Access Mark Up
			2325-P003-P005_Rev D-2325-P-003_A
			2325-P003-P005_Rev D-2325-P-004
			2325-P003-P005_Rev D-2325-P-005
B	Traffic Volume Information	Y	10402-Traffic and Transportation Statement_Rev D

Table 1 Contd...			
C	Speed Count Data	N	
D	Collision Data	N	
E	Departures from Standards	N	
F	Audit Brief	Y	RSA 1/2 Scope of Audit to include internal site layout only
G	Other Data / Documents	Y	10402-DMURS - Statement of Consistency _ Rev D 2325_Planning Statement_Connections 2325_Planning Statement_Permeability

TABLE OF CONTENTS

	Page
Document Control Sheet	1
Background Information	2
1. Introduction.....	5
2. Issues Raised by the Stage 1/2 Rd Safety Audit.....	8
3. Audit Team Statement.....	19
Appendix A - Road Safety Audit Brief Checklist	
Appendix B - Photographs from Site Visit	
Appendix C - Scheme Drawing(s)	
Appendix D - Feedback Form	

1. INTRODUCTION

- 1.1 This report results from a Stage 1/2 Road Safety Audit (RSA) of the internal site layout at a new residential development, in Moneyduff, Oranmore, Co Galway, carried out at the request of TOBIN Consulting Engineers. The site is located to the west of the N67 (old N18) national road approximately 10km to the southeast of Galway City Centre, at the location shown in Figure 1. This Audit examines the road safety implications associated with development of the site including all internal access roads and junctions within the red line boundary of the site shown in figure 2. The Audit did not include the link road and roundabout running along the eastern boundary of the site or the connection to the existing roundabout on the N67, as this infrastructure has been granted permission through development of adjacent lands surrounding the subject site, and as such is subject to separate Auditing procedures.

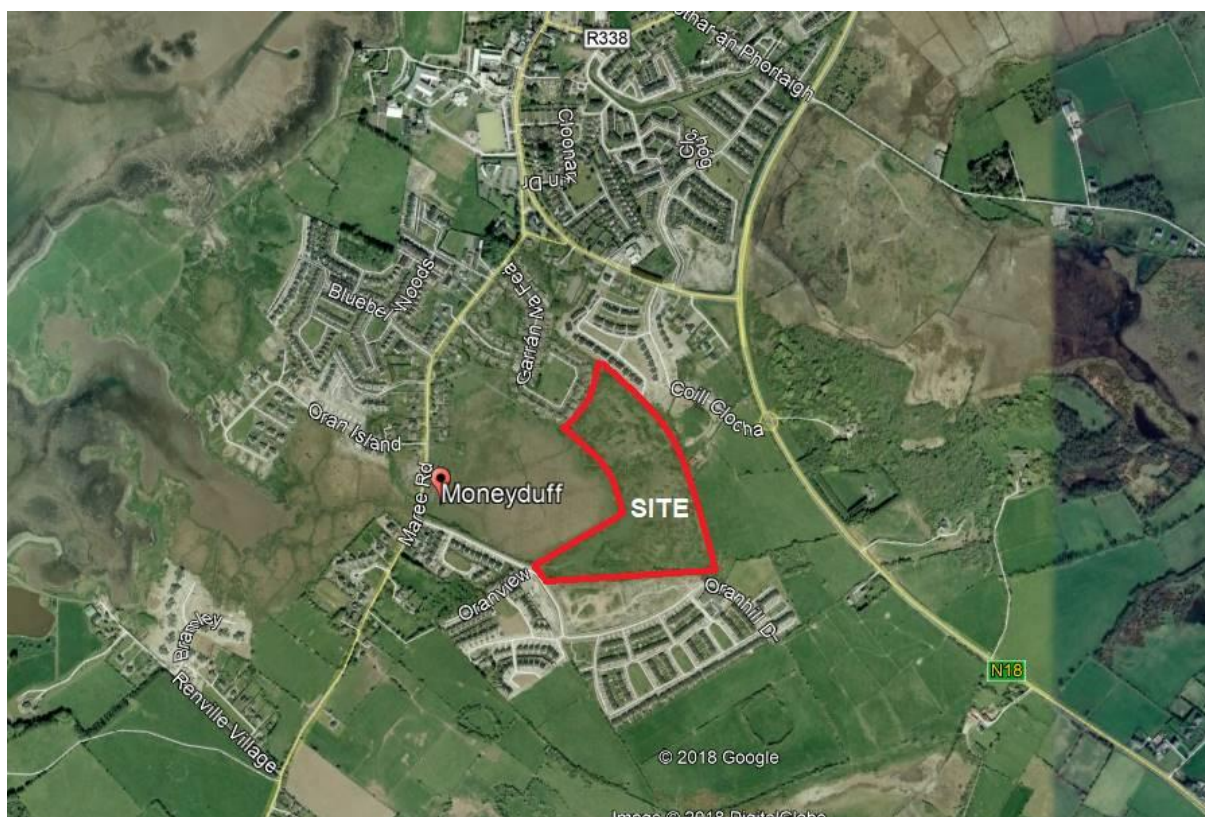


Figure 1: Site Location Plan (Red Line Boundary Indicative Only)



Figure 2: Internal Site Layout

- 1.2 The RSA was carried out during March and April 2018 and included a site visit by the Audit Team on Friday 9th March 2018 during daylight hours. The weather at the time of the site visit was fine and dry, and the surface of the road was predominantly dry. Traffic conditions on the N67 adjacent to the site were light and the posted speed limit on the N67 adjacent to the site was 100 km/hr.
- 1.3 The Audit Team Membership was as follows;
- | | |
|--------------|---|
| Team Leader: | Miriam O'Brien – BE (Civil) FIHE MIEI MCIHT SoRSA CoC |
| Team Member: | Anthony Sumner – HNC Civil Eng, AEng, MIEI, MIHT |
- 1.4 The Audit took place at the offices of Road Safety Matters following the site visit by the Audit Team. The Audit was undertaken in accordance with the Design Team's Audit Brief, and comprised an examination of the plans provided by the Design Team, as listed in Background Information, Table 1.
- 1.5 The terms of reference of the Audit are as described in TII GE-STY-01024 Dec 2017. The team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria. Comments on potential issues arising from a safety review of the site with reference to the Design Manual for Urban Roads and Streets (DMURS) have also been included where relevant, in respect of urban nature of the development. DMURS changes the approach to traffic safety in urban areas with the emphasis now on creating low-speed environments where it is clear to car drivers that they must give way to vulnerable road users (VRUs), thus reversing the traditional vehicle-dominated road hierarchy to favour non-motorised traffic.
- 1.6 Section 2 of this report contains issues raised by the Stage 1/2 RSA together with recommendations to be considered. Section 3 contains the Auditor Team Statement. Most issues raised in Section 2 can be cross-referenced with the scheme drawing (**Appendix C**) and photographs taken on the site visit (**Appendix B & Within Body of Report** where necessary).

2. ISSUES RAISED BY THE STAGE 1/2 ROAD SAFETY AUDIT

2.1 GENERAL

2.1.1 The designers have not advised of any departures from standard.

2.1.2 There was no information provided relating to cross sections or long sections.

2.1.3 A review of the Road Safety Authority (RSA) online collision database indicates that there were a number of collisions recorded on the N67 to the west of the site between 2005 and 2014 inclusive, as shown in Figure 3, all resulting in minor casualties. The cluster of 3 collisions recorded at the roundabout were single vehicle collisions. It should be noted that the RSA database is not a comprehensive record of collisions, and should be reviewed in conjunction with the Local Authority / Gardaí records for the site.

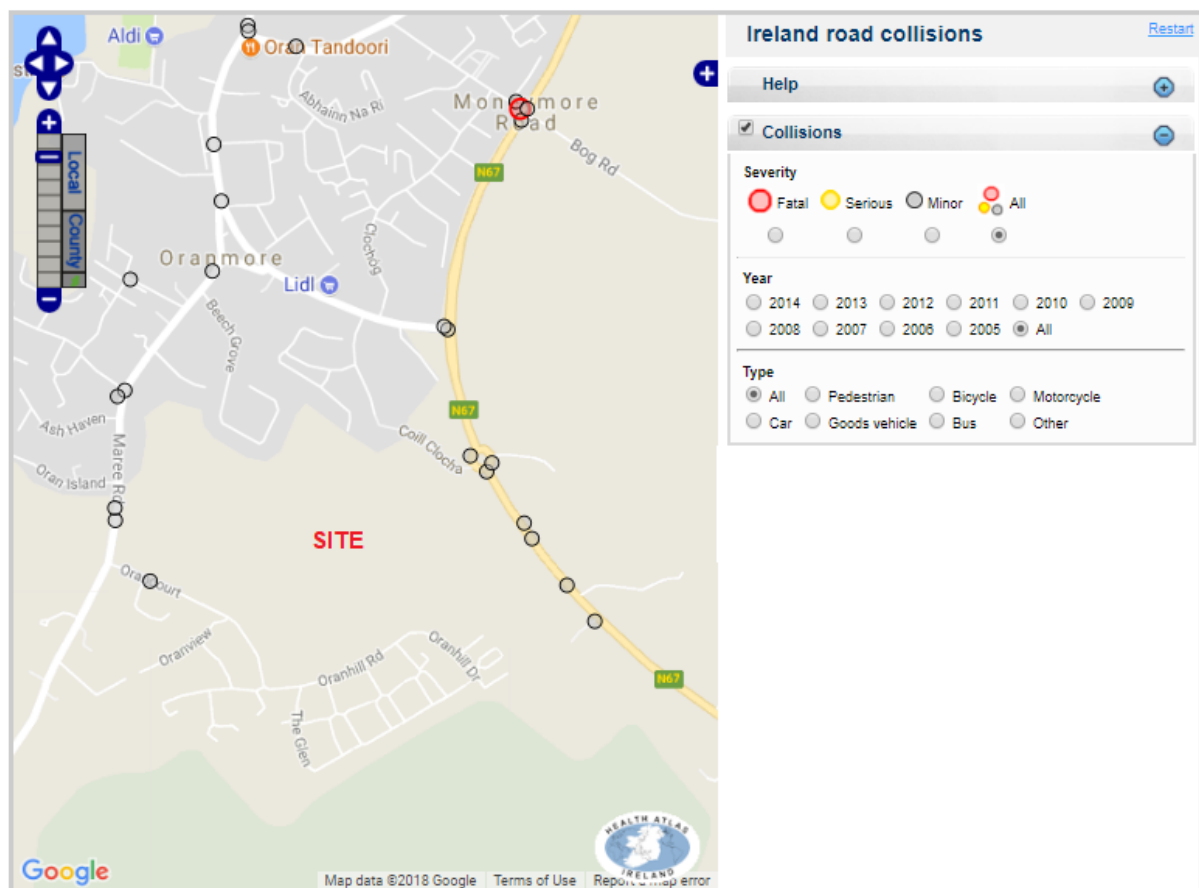


Figure 3: Collision Plot for Surrounding Road Network

2.1.4 Problem – Speed Limit at Site

The site will be accessed from a link connecting two roundabouts, one existing roundabout on the N67, which is shown in the photos in figures 4 and 5, and the other forming a new junction with a newly constructed network of roads serving proposed residential developments in the locality. The N67 is posted with a speed limit of 100 km/hr, and there is no other speed limit signage proposed on the internal estate roads. Observed site speeds on the N67 on approaches to the roundabout at the time of the site visit were considered high, which will increase the risks to all road users accessing the development from this direction. A pattern of single vehicle collisions was also noted in respect of the current collision history adjacent to the site, as outlined in paragraph 2.1.3, which are typically characterised by loss of control and speeds inappropriate to local conditions. 100 km/hr is characteristic of a high speed inter urban arterial route, and is considered too high for an area where a significant number of Vulnerable Road Users (VRUs, e.g. pedestrians and cyclists) should be anticipated, including children at play, and a speed limit of 30 km/hr or less would be considered more appropriate for an urban residential environment. The Designer has confirmed that it is expected that Vulnerable Road Users (VRUs) *i.e.* pedestrians and cyclist will access the nearby village via the permitted link road adjacent to the site and then through the adjacent Coill Clocha development to the North as this provides the shortest available and therefore most direct and desirable route. There is also a route via the adjacent Oranhill development to the South. It is anticipated that both of these routes are more desirable and safer than the N67 and VRU's will be encouraged to take these routes accordingly.



Figure 4: Northbound Approach to roundabout on N67



Figure 5: Southbound Approach to roundabout on N67

It was noted that there is provision for uncontrolled pedestrian courtesy crossings throughout the site, which should assist in encouraging low speeds, the cross sections have been updated following preliminary comments to increase the height to 100mm *i.e.* the same as the kerb height. There is also provision for an open space/home-zone area within the site, as highlighted in figure 6, while no details have been provided for signage at this preliminary stage, the road width has been reduced in line with DMURS in order to encourage slower speeds by way of driver recognition and a corresponding need for change in behaviour of drivers as per the principles of DMURS.



Figure 6: Proposed Home Zone Area

Recommendation

Ideally a 'Slow Zone' or a lower advisable speed limit appropriate to VRU priority in accordance with DMURS¹ should be applied to the internal estate roads, with clear signage within the 'Home Zone' area in particular. Signs for the reduced speed limit(s) should be posted in full view of motorists in a safe location with a minimum offset of 450mm from carriageway edge in a location

¹ Studies have shown that at an impact speed of 45-50 km/hr a pedestrian will have an estimated 27% chance of survival. At an impact speed of 60 km/hr or more the chance of survival is less than 1%. A reduction of 10 km/hr in travel speed reduces collision risk by 21% and fatality rates by 50%. Signage alone is unlikely to change driver behaviours, and some physical measures are usually necessary.

which does not obstruct the movement of pedestrians or cyclists. More conventional speed control measures with suitable vertical deflection should be considered throughout the site, and an investigation should be made into current speeds and the need for traffic calming on all links on approaches to the site where VRU desire lines will arise as a result of the development proposals to ensure risks are not exacerbated by any significant increase in traffic and VRU demands to access the site as a direct result of the development.

2.1.5 Problem – Parking

A traffic statement has been provided to the Audit Team including the anticipated traffic volumes and composition for the site, and the likely cumulative parking demand. Details are further shown on the legend of the architect's layout. Parking spaces have been provided to the left and right at a number of internal junctions within the site, and vehicles parked at these locations may create obstructions within visibility splays, which can increase the risk of right angled collisions and pulling out type incidents. Any demand for additional on street parking may also present issues in terms of safe two-way movement on links, as well as potential obstructions in visibility splays at nearby junctions. Perpendicular parking spaces have been provided at many locations throughout the road network surrounding the site, which may result in reversing manoeuvres into the path of Vulnerable Road Users (VRUs – including pedestrians and cyclists) and turning or passing traffic. At a number of locations, it was unclear if sufficient forward visibility and stopping sight distance has been provided towards vehicles potentially reversing from parking spaces, with building lines and/or proposed landscaping potentially causing obstruction.

Recommendations

All proposed junctions and links should cater for anticipated traffic demands and turning movements. Parallel parking to be provided wherever possible instead of perpendicular parking, to minimise the need for reversing manoeuvres within the site, particularly adjacent to likely pedestrian desire lines. Parking should be restricted adjacent to all junction visibility splays and at locations where intervisibility between road users could be compromised. Forward visibility and stopping sight distance at all junctions and along all links should be clear and unobstructed in accordance with traffic speeds. Parking on shared surface links to be closely monitored to

ensure vehicles do not obstruct the safe passageway of other vehicles or cause obstruction within desire lines for VRUs.

2.1.6 Problem – Boundary Treatment and Landscaping

The details provided on proposed boundary treatment throughout the site show provision for boundary heights ranging from 1.2-2m. Boundaries higher than driver eye height of 1.05m in close proximity to junctions and potential conflict points may restrict clear forward visibility towards oncoming traffic or reversing vehicles, and may also cause obstructions in visibility splays and compromise intervisibility between motorists and VRUs. The landscaping proposals for the site show proposed trees and landscaping located at positions which may also restrict forward visibility and intervisibility, both between parking spaces as well as between motorists and pedestrians wishing to cross on desire lines, depending on tree/landscaping heights. Trees located adjacent to pedestrian routes and footways can cause slippery conditions due to fallen leaves and can also compromise street lighting, with roots also potentially causing pavement damage over time.

Recommendations

Landscaping proposals to ensure that trees and landscaping are not located in positions which could increase the risk of conflict or have a negative impact on intervisibility at VRU desire lines within the site. Visibility splays at all junctions should be clear and unobstructed at all times in accordance with traffic speeds, hence any proposed landscaping or street furniture, signs, boundary treatments etc, including walls, which impact upon this visibility should be removed or relocated outside the visibility splay or maintained at a height less than 1.05m above ground level. Trees and landscaping should be offset a safe distance from the edge of running lane (recommended minimum 450mm) and ideally away from footways or areas where shedding leaves and tree roots may cause slip/trip hazards, or where street lighting luminescence may be compromised.

2.2 JUNCTION LAYOUT AND LINK ALIGNMENT/CROSS SECTION

2.2.1 Problem – Link and Junction Geometry

A swept path analysis has been provided to demonstrate that the proposed layout will accommodate the turning movements of all anticipated vehicle sizes, including emergency and refuse vehicles, with adequate margins of safety. The analysis shows encroachment into VRU areas and into the path of opposing vehicles at some locations, including on a number of relatively tight horizontal curves throughout the site, with no apparent provision for widening on the curves to facilitate safe two-way traffic movement at all times. Some vehicles waiting to turn from internal junctions will obstruct entering vehicles. VRUs are particularly vulnerable at tight radii where larger vehicles / HGV traffic can encroach into the footway and compromise pavement stability as well as increase the risk of conflict with VRUs.

Recommendations

The geometry should be reviewed to ensure that the proposed layout at all proposed junctions and links within the site will accommodate the turning movements of all anticipated vehicles sizes with adequate margins of safety, at all times, and to ensure that two-way movement will be possible, to prevent the risk of head on and side swipe collisions, and to ensure that vehicles waiting to turn from junctions on minor roads do not obstruct the movement of vehicles waiting to turn in from the major roads. Alternatively, the Designer should demonstrate that simultaneous access by larger vehicles will be infrequent.

2.2.2 Problem – Kerb and surfacing Details

There were no cross-section details provided to show kerb heights surrounding the site and details of surfacing types, as well as the treatment of joints between differing paving types, and no details are shown for the treatment of apparent level differences surrounding the castle tower, with no cross-section details provided to demonstrate safe slopes. Similar paving colours and types are also shown on the plan in respect of open space / pedestrian routes, parking areas, and through routes, with an example shown in figure 7, which may lead to confusion for both motorists and pedestrians, particularly the visually impaired. The distinction between similar

surface types can fade dramatically during wet and dark conditions, when the function of different areas becomes unclear and the risk of trip hazards are significantly increased. Figure 7 shows an ambiguous layout where it appears that vehicle movements will be possible immediately adjacent to a proposed playground, where young children will be playing and the risk of conflict is significantly higher.



Figure 7: Ambiguous Layout

Recommendations

The playground should ideally be offset from the neighbouring traffic routes and locations where vehicles will be passing or turning. Provision should be made for suitable dropped kerbs to facilitate vehicular access at driveways. All pedestrian routes and desire lines should be very clearly visually distinguishable from vehicular routes and parking areas wherever possible, including on shared surfaces at the same level. The treatment of joints between different paving types at similar levels should also be clarified, with trip hazards for pedestrians and obstructions for the mobility impaired to be minimised through provision of maximum kerb upstands of 6mm on all likely pedestrian desire lines across the path of moving traffic. Clearly visible and ideally textured delineation should be provided between level areas to be used by motorised traffic and those to be used by pedestrians for the benefit of the visually impaired.

2.2.3 Problem – Junction Form of Control

There are yield road markings shown at internal junctions within the site, which have a more onerous visibility requirement, which is unlikely to be satisfied within the proposed design layout.

Recommendations

The internal priority-controlled junctions should ideally be stop controlled, with appropriate signs and road markings. The treatment of all junctions should be rationalised and consistent where possible to enable a clear and predictable, self-explaining layout to be provided for all road users.

2.3 NON-MOTORISED USER PROVISION

2.3.1 Problem – Pedestrian Provision

A number of issues were noted in respect of the detailed design proposals for pedestrians throughout the site, including mobility and visually impaired pedestrians as follows:

- No dropped kerbs and tactiles have been provided across the mouth of internal site junctions for the benefit of visually and mobility impaired pedestrians
- Ambiguous crossing layouts are provided within site, which do not conform to standard layouts. A number of crossings located in close proximity appear to have different layouts/treatments, as highlighted in figure 8, which is likely to cause confusion for road users, who should be presented with consistent layouts throughout the same area. All crossings should generally conform either as controlled or uncontrolled to prevent confusion regarding rights of way.



Figure 8: Conflicting Layouts for Crossings

- details of pedestrian connectivity to the surrounding network should be considered prior to construction.

Recommendations

Pedestrian activity, desire lines and demands should be considered prior to construction taking into account all issues raised above, with dropped kerbs and suitable tactile paving to be installed on all desire lines to cross the carriageway across the path of moving vehicles. Footways should be clear and unobstructed at all times, with all street furniture located to rear of footway where possible in a location which does not compromise the footway width to less than the absolute minimum desirable width of 1.2m on isolated sections, and 2m elsewhere. All chamber covers effected by the works to be raised or lowered should be flush with surrounding pavement and ideally located outside pedestrian and cyclist desire lines.

2.4 ROAD SIGNS, MARKINGS AND LIGHTING

2.4.1 Problem – Lighting

A preliminary design has been provided for proposed lighting within the site. The new scheme will need to be adequately lit to minimise the risk of collisions occurring during the hours of darkness.

Recommendation

The detailed design drawings should include for new lighting where required throughout the site. All lighting columns should be placed to the rear of footway where possible, and ideally passively safe, particularly those located within the shared space areas, with all columns throughout the site to be located at a minimum offset of 450mm from the carriageway edge to avoid being struck by passing vehicles.

2.4.2 Problem – Signing and Lining Generally

A lining drawing has been provided showing the road markings and thus the priority at junctions. There is no signing schedule provided with the detailed design drawings for this planning stage, including Stop signs and road markings, cul de sac signs, signage warning of children at play, warning signs for pedestrian crossings, warning signs regarding vertical deflection, home zones and reduced internal speed limit signs.

Recommendations

Proposed signing and lining to be reviewed where necessary at detailed design stage in light of items raised above with a lining and signing schedule to be produced, commensurate with detailed design requirements. Any new signs should be placed in a location which is clearly visible to approaching motorists in accordance with traffic speeds. The lowest edge of all signs should be set at a height of 2.1m or higher over footway and at 2.4m or higher over a surface which may be used by cyclists, with all signs / street furniture to be located a minimum 450mm from the edge of kerb to minimise the risk of being struck by passing / turning vehicles.

All road markings and signage to be highly reflective material to ensure visibility during the hours of darkness.

3. AUDIT TEAM STATEMENT

We certify that we have visited the site and examined the drawings and information supplied. This examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems identified have been noted within the report, together with suggestions for improvements which are recommended to be studied for implementation. No one on the Audit Team has been otherwise involved with the design of the measures audited. This audit has been carried out in accordance with TII GE-STY-01024 December 2017.

Signed:

A handwritten signature in blue ink, appearing to read 'Miriam O'Brien', written over a horizontal line.

Date: 4/4/19

MIRIAM O'BRIEN

Signed:

A handwritten signature in blue ink, appearing to read 'Anthony Sumner', written over a horizontal line.

Date: 4/4/19

ANTHONY SUMNER

APPENDIX A – ROAD SAFETY AUDIT BRIEF CHECKLIST

Have the following been included in the audit brief?: (if 'No', reasons should be given below)

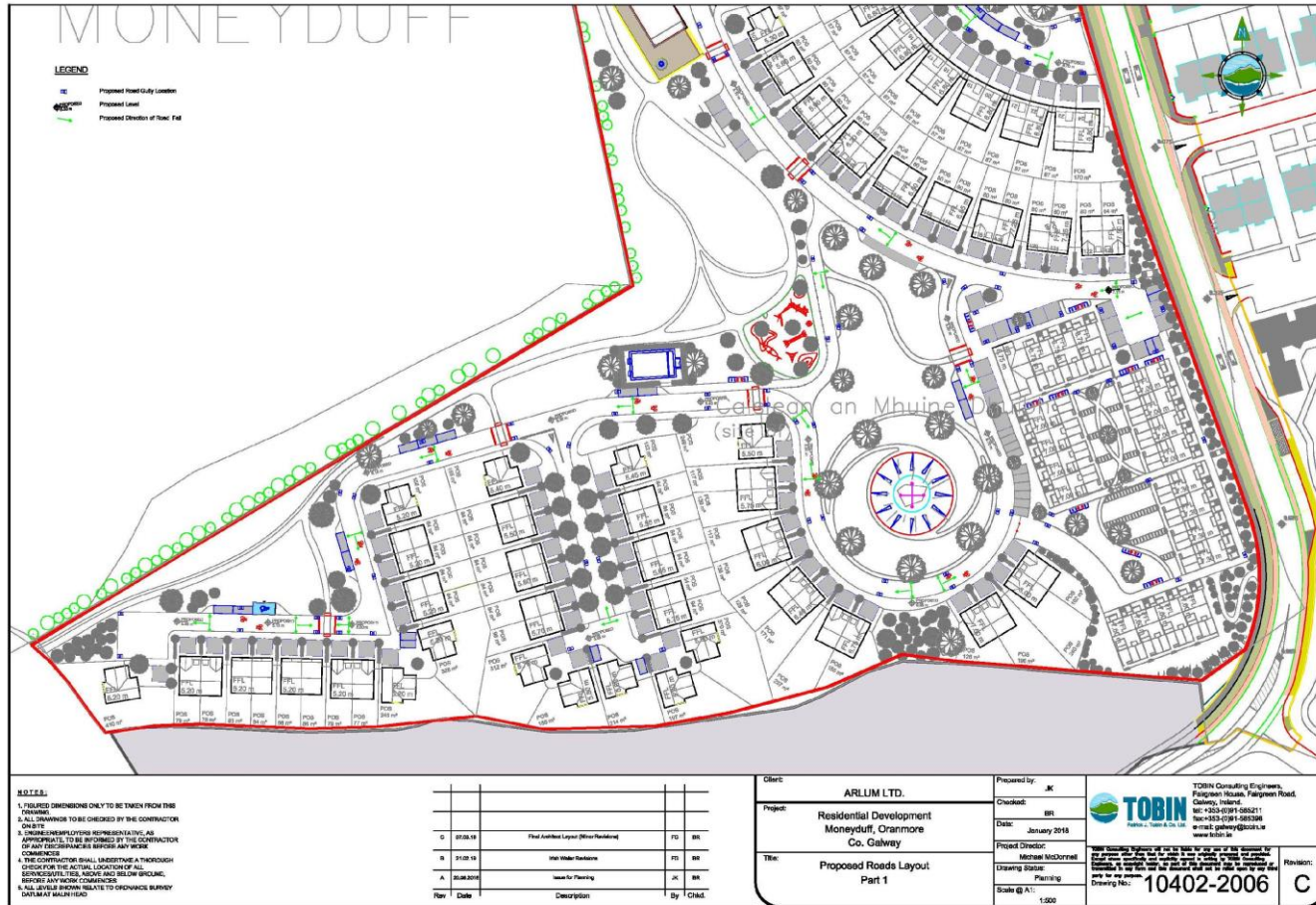
	Yes	No
1. The Design Brief	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Departures from Standard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Scheme Drawings	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Scheme Details (e.g. signs schedules, traffic signal staging)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Collision data for existing roads affected by scheme	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Traffic surveys	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Previous Road Safety Audit Reports and Designer Responses/Feedback Form	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Previous Exception Reports	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Start date for construction and expected opening date	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Any elements to be excluded from audit	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Any other information?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Re 10. Audit scope includes internal site layout only. External infrastructure excluded

APPENDIX B – SITE PHOTOGRAPHS







Road Safety Audit Feedback Form

Scheme: Residential Development, Moneyduff, Oranmore, Co Galway

Route No. N/A

Audit Stage: 1/2

Date Audit Completed: April 2019

	To Be Completed By Designer			To Be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting recommended measure	Alternative measures or reasons accepted by auditors (yes/no)
Section 2.1.4 Speed Limit at Site	Yes	Yes	Speed control measures revised. Speed limit signage detail to be investigated at detail design phase - provisionally 30 km/hr limit is envisaged aided by passive control through layout and uncontrolled pedestrian crossings (revised detail included with greater vertical deflection). Design will include for less signage and minimisation of hazards	Yes

Section 2.1.5 Traffic Volumes and Parking	Yes	Yes. Traffic Statement and parking layout revised	Parking Layout revised. The parking has been kept as far away from the junctions as possible and also kept on properties in order to keep traffic away from parking on kerbs etc where possible.	Yes
Section 2.1.6 Boundary Treatment and Landscaping	Yes	Yes	Landscape Layout updated. There will be a management company put in place to maintain the paths and keep them free from leaves and the company will carry out repairs etc. In terms of street tree specification we would intend to use <i>"Extra Heavy Standards / Trunk Girth 18-20cm / Height at planting 4.5-5m / Clear Stem Minimum 2m height"</i> i.e. all tree canopies will be minimum of 2m clear of ground level when planted ensuring clear sightlines. In general visibility to be maintained, e.g. tree crowns to be kept high to allow adequate visibility.	Yes
Section 2.2.1 Link and Junction Geometry	Yes	Yes	Swept path analysis provided. As it is in a residential development access by large vehicles will be infrequent and will not occur at the same time.	Yes
Section 2.2.2 Kerbs and Surfacing Details	Yes	Yes	Layout and details revised. The playground will be fenced and setback (see boundary treatment plan and Drg 2325-P-032).	Yes

			The architect has provided further details on dropped kerbs (example shown on Drg 2325-P-027), kerbs and colour contrast. Kerb and surfacing details are now provided.	
Section 2.2.3 Junction Form of Control	Yes	Yes	Road markings added to layout to provide clear direction to all road users.	Yes
Section 2.3.1 Pedestrian Provision	Yes	Yes	Details updated. Pedestrian route drawing and drop kerb details now available. Dropped kerbs to be provided at junctions. Layout of area in figure 8 revised. Footways at crossings have been widened. Footways to be kept clear. Full permeability provided (see excerpt from design statement).	Yes
Section 2.4.1 Lighting	Yes	Yes	Lighting Layout provided with adequate lighting throughout the site.	Yes
Section 2.4.2 Signing and Lining	Yes	Yes	Lining Layout provided. Detailed signage scheme to be provided at detailed design stage.	Yes

Signed: Breelan Ruckless

Designer

Date 21/03/19

Signed: Duncan P. Smith

Audit Team Leader

Date 4/4/19