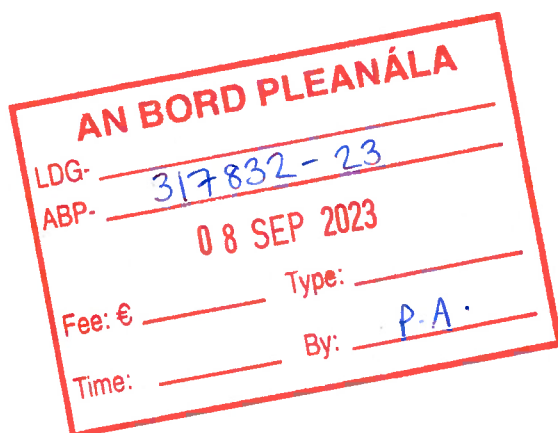
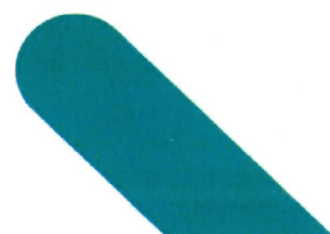




Environmental Impact Assessment Report

Sky Castle Ltd – Moygaddy
Mixed Use Scheme, Co.
Meath & Co. Kildare

Volume 3b: Site B – Healthcare
Facilities Appendices





APPENDIX 2-1

SCOPING RESPONSES

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David Naughton

From: Environmental Co-ordination (Inbox) <Environmental_Co-ordination@agriculture.gov.ie>
Sent: Wednesday 27 October 2021 08:56
To: David Naughton
Subject: FW: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Good Morning David

Further to my email below, I wish to inform you that the Department of Agriculture, Food & the Marine has no observations on the scoping document for the proposed development at this time.

Kind regards

Cathy Hewitt

Executive Officer

An tAonad um Chomhordú Timpeallachta, An Rannóg um Athrú Aeráide agus Beartas Bithfhuinnimh,
Environmental Co-ordination Unit | Climate Change & Bioenergy Policy Division |

An Roinn Talmhaíochta, Bia agus Mara

Department of Agriculture, Food and the Marine

Pailliún A, Páirc Gnó Grattan, Bóthar Átha Cliath, Port Laoise, Co Laoise, R32 K857

Pavilion A, Grattan Business Park, Dublin Road, Portlaoise, Co Laois, R32 K857

T +353 (0)57 868 9915 environmentalco-ordination@agriculture.gov.ie

www.agriculture.gov.ie

From: Environmental Co-ordination (Inbox)
Sent: Friday 22 October 2021 08:34
To: 'dnaughton@mkoireland.ie' <dnaughton@mkoireland.ie>
Cc: Hennebry, Breeda <Breeda.Hennebry@agriculture.gov.ie>
Subject: RE: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Good Morning David

I have received your query below. Upon checking it would appear that we did not receive your original request for comments on the 9th August. The email you used as incorrect (there is an underscore excluded). However, I will forward the documents to the relevant sections and ask them to revert with any obs they may have ASAP.

Kind regards

Cathy Hewitt

Executive Officer

An tAonad um Chomhordú Timpeallachta, An Rannóg um Athrú Aeráide agus Beartas Bithfhuinnimh,
Environmental Co-ordination Unit | Climate Change & Bioenergy Policy Division |

An Roinn Talmhaíochta, Bia agus Mara

Department of Agriculture, Food and the Marine

Pailliún A, Páirc Gnó Grattan, Bóthar Átha Cliath, Port Laoise, Co Laoise, R32 K857

Pavilion A, Grattan Business Park, Dublin Road, Portlaoise, Co Laois, R32 K857

T +353 (0)57 868 9915 environmentalco-ordination@agriculture.gov.ie

www.agriculture.gov.ie

From: McGoldrick, David
Sent: Thursday 21 October 2021 16:48
To: Environmental Co-ordination (Inbox)
Subject: FW: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Hello,

Please see query below. Thanks.

David

From: David Naughton <dnaughton@mkoireland.ie>

Sent: 20 October 2021 16:24

To: Info@agriculture.gov.ie

Subject: FW: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

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Dear Sir or Madam,

Just following up on the below to see if the department has any comments or recommendations on the proposed project.

Kind regards,



David Naughton B.Sc. (Env.)

Environmental Scientist

MKO

Tuam Road, Galway

Ireland, H91 VW84

+353 (0) 91 735611

www.mkoireland.ie



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From: David Naughton

Sent: Monday 9 August 2021 15:11

To: environmentalco-ordination@agriculture.ie

Subject: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Dear Sir or Madam,

Please find attached a cover letter and Scoping Document for a proposed mixed use development in Moygaddy, Co. Meath. The site is located just north of Maynooth town.

As part of the scoping exercise for the proposed development, we would welcome any comments in relation to the proposed project.

If you have any queries, please do not hesitate to contact me.

Kind regards,



David Naughton B.Sc. (Env.)

Environmental Scientist

MKO

Tuam Road, Galway

Ireland, H91 VW84

+353 (0) 91 735611

www.mkoireland.ie



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Department of Agriculture, Food and the Marine

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An Roinn Talmhaíochta, Bia agus Mara

Tá an t-eolais san ríomhphost seo, agus in aon ceangláin leis, faoi phribhléid agus faoi rún agus le h-aghaidh an seolaí amháin. D'fhéadfadh ábhar an seoladh seo bheith faoi phribhléid profisiúnta nó dlíthiúil. Mura tusa an seolaí a bhí beartaithe leis an ríomhphost seo a fháil, tá cosc air, nó aon chuid de, a úsáid, a chóipeál, nó a scaoileadh. Má tháinig sé chugat de bharr dearmad, téigh i dteagmháil leis an seoltóir agus scrios an t-ábhar ó do ríomhaire le do thoil.

Emily Lynch

From: CorporateSupport.Unit <CorporateSupport.Unit@decc.gov.ie>
Sent: 27 August 2021 15:21
To: David Naughton
Cc: CorporateSupport.Unit
Subject: Reply from DECC re EIS 21/ 297 Proposed Mixed Use Development at Moygaddy, Co. Meath
Attachments: GSI datasets relevant to EIA & SEA_20210421.pdf; 21_297 Proposed Mixed Use Development at Moygaddy Co. Meath.pdf; 20210809 Frm MKO re DECC cover letter ref 210414.pdf

Good afternoon,

Please see attached and below a reply from Ms. Trish Smullen and Dr Clare Glanville (Senior Geologist) on behalf of Geological Survey Ireland, (a division of the Department of Environment, Climate and Communications) for the subject below.

Please forward an acknowledgment of receipt to CorporateSupport.Unit@decc.gov.ie at your earliest convenience. I have attached your letter of 09/08/2021 for reference.

Regards,
Enda Brady,
Corporate Support Unit ,
Department of Environment, Climate and Communications.

From: GSI Planning
Sent: 27 August 2021 13:52
To: CorporateSupport.Unit
Cc: Clare Glanville; GSI Planning
Subject: Re: EIS 21/ 297 Proposed Mixed Use Development at Moygaddy, Co. Meath

Hi Enda,
Please see attached for return to MKO.
Thanks and regards,
Trish

From: GSI Planning
Sent: 10 August 2021 10:14
Cc: GSI Planning
Subject: EIS 21/ 297 Proposed Mixed Use Development at Moygaddy, Co. Meath

EIS 21/ 297 Proposed Mixed Use Development at Moygaddy, Co. Meath.

Request for observations by MKO for direct reply. Scoping document attached.

Regards,
Trish

Emily Lynch

From: CorporateSupport.Unit <CorporateSupport.Unit@decc.gov.ie>
Sent: 21 October 2021 10:34
To: David Naughton
Cc: CorporateSupport.Unit
Subject: RE: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Good morning David,

Corporate Support Unit have forwarded two replies to you on 16/08/2021 (Inland Fisheries Ireland) and 27/08/2021 (Geological Survey Ireland). I have circulated the reminder below to the other appropriate contacts and asked for a reply (if any) before the end of this month. If there are any observations I will forward these to you.

Regards,
Enda Brady,
Corporate Support Unit,
Department of Environment, Climate and Communications.
087 623 7714

From: David Naughton [mailto:dnaughton@mkoireland.ie]
Sent: 19 October 2021 16:14
To: CorporateSupport.Unit
Cc: CorporateSupport.Unit
Subject: RE: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

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Dear Sir or Madam,

Just following up on the below to see if the department has any comments or recommendations on the proposed project.

Kind regards,



David Naughton B.Sc. (Env.)
Environmental Scientist

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Ireland, H91 VW84
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www.mkoireland.ie



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Mr. David Naughton BSc
MKO,
Tuam Road,
Galway
H91VW84
1st September 2021

Re: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

Dear David,

The Department of Transport would like the following to be taken into consideration in relation to the proposed mixed use development at Moygaddy, Co. Meath

Given the proximity of the Moygaddy sites to the Royal Canal Greenway and NTA plans for additional cycling and pedestrian facilities within Maynooth, it will be vital that the masterplan being developed includes significant provision for cycling and pedestrian access from the sites to Maynooth train station, the University and the Royal Canal Greenway and also significant provision for cycle parking within the sites.

Yours sincerely,

Jacqui Traynor
Reform Communications Emergency Planning

An Roinn Iompair
Department of Transport

Lána Liosain, Baile Átha Cliath, D02 TR60
Leeson Lane, Dublin, D02 TR60

T +353 (0)1 604 1177
Jacquitraylor@transpo.rtgov.ie www.gov.ie/transport

David Naughton

From: planning applications <planning.applications@failteireland.ie>
Sent: Thursday 19 August 2021 11:48
To: David Naughton
Subject: RE: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath
Attachments: Fáilte Ireland EIAR Guidelines.pdf

Hello David,

Thank you for your email regarding the scoping document for the proposed Mixed Use Development at Moygaddy, Co. Meath

Please see attached the updated copy of Fáilte Ireland's Guidelines for the Treatment of Tourism in an EIA, which you may find informative for the preparation of the Environmental Impact Assessment for the proposed project. The purpose of this report is to provide guidance for those conducting Environmental Impact Assessment and compiling an Environmental Impact Assessment Reports (EIAR), or those assessing EIARs, where the project involves tourism or may have an impact upon tourism. These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2.

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 7224 | M +353 (0) 860357590 | www.failteireland.ie



Please consider the environment before printing this email

From: David Naughton <dnaughton@mkoireland.ie>
Sent: Monday 9 August 2021 16:16
To: planning applications <planning.applications@failteireland.ie>
Subject: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

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Dear Sir or Madam,

Please find attached a cover letter and Scoping Document for a proposed mixed use development in Moygaddy, Co. Meath. The site is located just north of Maynooth town.

As part of the scoping exercise for the proposed development, we would welcome any comments in relation to the proposed project.

If you have any queries, please do not hesitate to contact me.

Kind regards,



David Naughton B.Sc. (Env.)
Environmental Scientist

MKO

Tuam Road, Galway
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Fáilte Ireland

National Tourism Development Authority

EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects



An tÚdarás Náisiúnta Forbartha Turasóireachta
Áras Fáilte, 88–95 Sráid Amiens
Baile Átha Cliath 1
D01 WRB6
Éire

National Tourism Development Authority
Áras Fáilte, 88 - 95 Amiens Street
Dublin 1
D01 WRB6
Ireland

Phone 1890 525 525
or +353 1 884 7700
Email info@failteireland.ie
www.failteireland.ie

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1. Introduction

Tourism is a growing sector and substantial part of the Irish Economy. It contributes to both urban and rural economies in every part of the country. The impact and interaction of tourism with the environment is complex and the assessment of environmental impacts is of utmost importance to creating a sustainable tourism economy and protecting the natural resources that are so often a tourism attraction.

The purpose of this report is to provide guidance for those conducting Environmental Impact Assessment and compiling an Environmental Impact Assessment Reports (EIAR), or those assessing EIARs, where the project involves tourism or may have an impact upon tourism. These guidelines are non-statutory and act as supplementary advice to the EPA EIAR Guidelines outlined in section 2.

This guidance document has been prepared by Cunnane Stratton Reynolds on behalf of Fáilte Ireland to update their EIA guidelines in line with changes in legislative requirements.

2. Background to this Document

Tourism is one of the largest and most important sectors of the economy, providing employment for approximately **260,000 people**, an economic contribution of **€8.4 billion**, and exchequer revenue of **€1.78 billion** in 2018, which helps fund other key public services.

In 2018 Ireland welcomed **10.6 million overseas visitors**.

Fáilte Ireland is the National Tourism Development Authority. Fáilte Irelands role is to support the tourism industry and work to sustain Ireland as a high-quality and competitive tourism destination. They provide a range of practical business supports to help tourism businesses better manage and market their products and services.

Fáilte Ireland also work with other state agencies and representative bodies, at local and national levels, to implement and champion positive and practical strategies that will benefit Irish tourism and the Irish economy.

Fáilte Ireland promotes Ireland as a holiday destination through a domestic marketing campaign (DiscoverIreland.ie) and manage a network of nationwide tourist information centres that provide help and advice for visitors to Ireland.

Tourism related projects cover a broad range of plans, programmes and developments, from the Wild Atlantic Way to a single hotel conversion. These guidelines apply to projects involving or impacting upon tourism. A tourism plan, strategy or programme where it is part of the statutory plan making process under the Planning and Development Acts (as amended), may be more appropriately assessed by a Strategic Environmental Assessment (SEA) as discussed in the next section.

It should be borne in mind that EIA is required where there is anticipated to be a significant impact on the environment, where tourism projects are of a prescribed type or meet thresholds identified below.

Where Natura 2000 Designated Sites are potentially affected by tourism development Appropriate Assessment must be carried out by the appropriate authority in accordance with Article 6(3) of the EU Habitats Directive.

3. Legislation and Statutory Guidance

Environmental Impact Assessment is a procedure that ensures that the environmental implications of decisions are taken into account before planning based decisions are made. The assessment results in a report, called an Environmental Impact Assessment Report (EIAR).

Legislation

These guidelines are produced under current EIAR legislative requirements, having regard to Directive 2011/92/EU (known as 'Environmental Impact Assessment' – EIA Directive), as amended by Directive EU 2014/52 which came into effect in May of 2017. These requirements were transposed into Irish Law on 1 September 2018 as most of the provisions of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) came into effect. The principle of both Directives is to ensure that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation.

Statutory Guidance

In response to the changes to the EIAR requirements under Directive EU 2014/52, the Environmental Protection Agency (EPA) developed Draft guidelines on the information to be contained in Environmental Impact Assessment Reports in August 2017. At the time of this document the guidelines have not been adopted from draft.

In addition to the EPA statutory guidance, the Department of Housing has produced Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment in August 2018.

The process of EIA is set out in the EPA EIAR Guidelines, which this document should be read in conjunction with and used as supplementary guidance to. The process for ascertaining whether an EIAR is required is known as 'screening' and the process to determine the breadth and scope of an EIAR is known as 'scoping'. Guidance on this can be found in Section 3.2 of the EPA Guidelines.

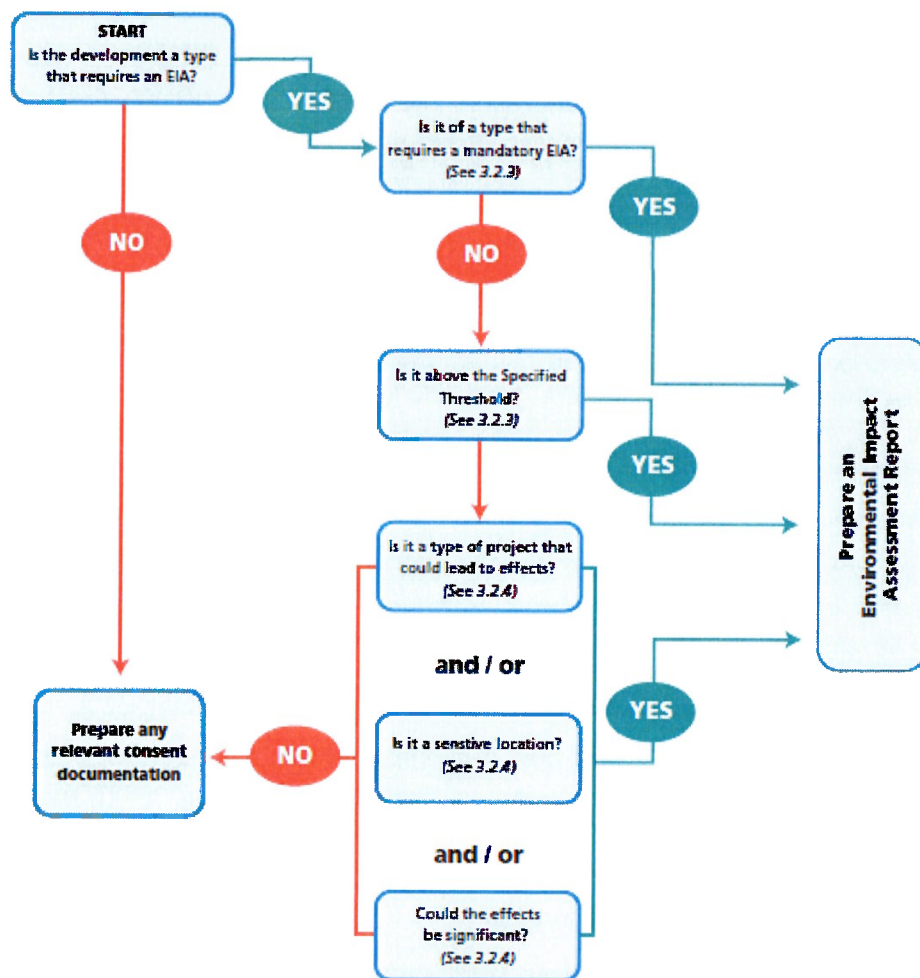
Screening

Through EIAR Screening, developments are either considered as requiring an EIAR due to the project type or because they exceed a threshold level. The screening process begins by establishing whether the proposal is a 'project' as understood by the Directive (as amended).

The prescribed development types and thresholds are set out in Annex I and II of the EIA Directive as transposed into Schedule 5 of the Planning and Development Regulations 2010-2018 (as amended). Development which do not exceed these thresholds but may require an EIAR are called sub threshold. Sub-Threshold considerations are outlined in Schedule 7 of European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) as transposed from Annex III of the Directive. The Guidelines on Environmental Impact Assessment Reports note that projects at first glance may not appear to come under the Schedule

but on closer examination when the process is further examined, they may do so because of the sensitivity or significance of the receiving environment etc. Sub threshold developments require an EIAR if they are likely to have significant environmental impacts and must undergo assessment for likely significant impacts through an EIAR screening report. The contents of a screening report for subthreshold development are contained in Annex III of the EIA Directive.

Figure 1: EIAR Screening Process



(Taken from Fig 3.2 of the EPA Guidelines)

Tourism locations should be identified as sensitive receptors in screening assessments for particular impacts, depending on scale and sensitivity, as they would in a full EIAR. Section 6 below can act as guidance for Screening Reports as well as for full EIAR.

The screening process for considering where an EIAR is necessary, is summarised below in Figure 1 (excerpted from Figure 3.2 of the EPA Guidelines).

Strategic Environmental Assessment (SEA) is a more strategic level of environmental assessment that examines plans, policies, objectives and programmes specifically rather than projects. For some tourism developments it may be more appropriate that they be examined through SEA, while individual projects or specific proposals are likely to be more assessed through EIAR. If a project is part of a plan, programme or policy/objective assessed by SEA there will still be a requirement for an EIAR for that development.

EIAR Scoping

Scoping an EIAR is an opportunity to look at the breadth of issues and ensure that any areas of possible significant impact are assessed. Identifying sensitivities and stakeholders should take account of tourism facilities and consider Fáilte Ireland in scoping requests where necessary.

4. Assessing Tourism

There is no legal definition of 'tourism' in Irish legislation. The UNWTO definition of sustainable tourism is *"Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities"*. This is widely accepted as a key definition of tourism as we move to a more sustainable future.

Tourism assessments are frequently carried out by economic consultants and by specific tourism consultants. It is always advisable, particular for tourism projects, that suitably qualified and experienced personnel are used to determine the impact of tourism related projects or to assess the impact of more general proposals on a tourism asset identified in a particular location. There is a requirement for EIAR under current legislation to contain a statement of competency within all EIAR documents, including screening and scoping reports.

Projects which involve a tourism element

Tourism projects are wide ranging and diverse. While there are some projects which cater to tourism and are easily identified as such - Hotels, Museums, etc. there are other projects where tourism is a key service or element, but which may not be immediately obvious - forest trails, community facilities and others. EIAR conducted for developments containing tourist elements should be completed in accordance with the current guidance from the EPA.

Projects which include a tourism element have potential particular environmental effects which differ from a non-tourism development. These impacts can be intermittent, event related, inconsistent, dependent on weather, temporal, temporary or seasonal. This is considered within the prescribed environmental topics for EIAR outlined in Section 7 below.

Projects which may have an impact upon tourism

While tourism projects may be diverse, the projects which can impact tourism are considerably more wide ranging, from large infrastructural developments to local energy developments. Disruption to or suppression of a tourist resource or amenity can have very local or more strategic impacts, directly or indirectly- for example energy projects in a rural area can have both a negative and positive impact in different regards. There can be temporary, periodic or even seasonal impacts occurring during construction or operational periods.

According to the Fáilte Ireland Tourism Facts 2018 Report, the most important factors in determining the attractiveness of tourism destinations for visitors to Ireland are;

- Beautiful Scenery and Unspoiled Environment
- Hospitality
- Safety
- Nature, Wildlife and Natural Attractions
- History and Culture
- Pace of Life

These factors used for the promotion of tourism in Ireland are also barometers of sensitivity to change in tourism sensitive or dominant locations where development may have an impact upon the tourism asset. The potential for development to impact these sensitivities, and the environmental criteria under which they can be considered, are identified in section 7 of the guidelines.

5. Guiding Principles of EIAR

As outlined in the EPA Draft EIAR Guidelines, the fundamental principles to be followed when preparing an EIAR, including screening and scoping, are:

- Anticipating, avoiding and reducing significant effects
- Assessing and mitigating effects
- Maintaining objectivity
- Ensuring clarity and quality
- Providing relevant information to decision makers
- Facilitating better consultation.

Environmental assessment should be undertaken in accordance with the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

6. Consideration of Competency and Qualifications

As per Section 2.5 of the EPA Guidelines, EIAR is required to be completed by 'competent experts'.

Contributors to the preparation of environmental impact assessment reports, including screening and scoping assessments, should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality so that a full and proper assessment can be undertaken.

For tourism related projects, or projects likely to affect tourism assets, competent experts in the area of tourism should be utilised in the environmental assessment.

The competency of all involved in the production of an EIAR or any related report (eg. Screening and scoping) is required to be stated at the beginning of the EIAR report with further details as necessary in each following chapter.

Where tourism projects involve for example heritage or cultural components, input from heritage consultants, conservation architects, or historians may be required.

7. EIAR Requirements

The following are the key requirements for an EIAR under the current guidance. This is not a definitive list and should be read in conjunction with regulations.

- project description;
- assessment of alternatives considered;

- baseline assessment;
- impact assessment;
- cumulative impact
- interaction of impacts
- mitigation.

Project Description

Project descriptions are required to describe the whole project including site, scale, design and key factors. It is important that the EIAR and design team have a consistent understanding of the development description in full. The key requirements are outlined in section 3.5 of the EPA Guidelines however they identify the following;

- the location of the project
- the physical characteristics of the whole project
- the main characteristics of the operational phase of the project
- an estimate, by type and quantity, of the expected residues and emissions

The location of the project should include identifying key sensitive receptors (including tourism receptors). In the operational phase of the project any tourism based, or potentially tourism related activity, should be identified.

Assessment of Alternatives

The assessment of alternatives is a requirement of EIAR

Where tourism projects are location dependent the assessment of alternatives should consider alternative methods and technologies, detail the key considerations culminating in the selection of the design, the reasoning for these and the environmental effect of these decisions. This is particularly important for tourism projects which are often location tied. The developer is expected to consider reasonable alternatives. What is considered reasonable may vary from case to case.

Baseline Assessment

Baseline descriptions are evidence based, current descriptions of environmental characteristics with consideration of likely changes to the baseline environment evidenced in planning histories, unimplemented permissions, and applications pending determination. Baseline assessments should identify any tourism sensitivities in the zone of influence of a development. This zone of influence of a development is highly dependant on its **Context, Character, Significance, and Sensitivity**, as outlined in the Draft Guidelines. These characteristics apply to both the development and the environment.

For example, in a tourism context;

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

The character of an area from a tourism perspective should be described and the principal types of tourism in the area. Where relevant, the specific environmental resources or attributes in the existing environment which each group uses or values should be stated and where relevant, indicate the time, duration or seasonality of any of those activities.

The significance of the tourism assets or activities likely to be affected should be highlighted. Reference to any existing formal or published designation or

recognition of such significance should be. Where possible the value of the contribution of such tourism assets and activities to the local economy should be provided.

If there are any significant concerns or opposition to the development known to exist among tourism stakeholders and interest groups, this should be highlighted. 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 or impacted.

In addition, the baseline should include any methodologies employed in the study to obtain information, if particular databases are used to locate sensitive receptors they should be acknowledged. In relation to tourism information, the suggested information sources at the end of this document are a non-exhaustive list which may be of assistance in identifying tourism receptors.

Impact Assessment

The topics for consideration of impact are prescribed in the EIA Directive and transcribed into Irish law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). Impact assessment should contain the likely significant effects of a development arising from both construction and operation of a development. Advice on describing the effects is contained within the Draft Guidelines and includes the **quality, significance, extent, probability, type** and **duration** of the effect, with particular descriptors for each. In describing effects upon tourism receptors these descriptors should take account of the particular aspects and sensitivities of tourism, for example a temporary annual effect from a development may have different impacts upon tourism if it falls at peak season rather than off-peak.

Impact assessment should be carried out as per EPA guidelines and the best practice for that prescribed topic. It may be considered appropriate to consider impact on tourism assets under the 'material assets' topic below.

Population and Human Health

The consideration of tourism projects within the Population and Human Health is extensive, with impacts ranging from rural employment population impacts of seasonal tourism, to the health impact of air pollution from increased traffic in urban areas.

The impact upon tourism can be considered within this section through the sensitivities of Hospitality, Safety and Pace of Life. Changes in population can impact the perception of pace of life or safety in a particular location. Impacts upon these issues in areas which rely heavily on tourism or have a particular sensitive tourism generator should be considered in this section.

Biodiversity

Particular tourist activities can have a significant impact upon biodiversity. Landscapes which are 'unspoiled' can be attractors of tourism. However, the disturbance to ecology must be managed to minimise impact. Biodiversity is also a tourism asset and should be protected as such from other development and should be provided for in proposals where possible.

Land, Soils and Geology

A link between tourism and this prescribed environmental factor, beyond the normal development impacts, is rare, however particular activities or facilities which use geological features may have an impact upon soils and geology, such as mountain biking trails, recreational uses of old quarries etc. Indirect impacts such as material use for extensive landscaping and public realm should also be considered.

Water

Tourism uses can be water intense, depending on development type. Recreational use of a surface water feature, water-based leisure centres etc have different impacts to standard development.

Air Quality and Climate

Tourism impact upon air quality is dependent on activity proposed and sensitivity of the location.

Noise and Vibration

A link between tourism and this prescribed environmental factor, beyond the normal development impacts, is rare, however the impact upon tourism of issues of noise and vibration can be significant. Construction adjoining hotels for example should consider the sensitivity of the development and ensure mitigation is in place.

Material Assets; Traffic and Transport

The different transport patterns associated with tourism activities is a key impact of tourism and should be considered especially for tourism projects. These produce temporal and seasonal changes on the norm and specialist consideration and interpretation should be given. Tourism proposals should, where possible, be well served by public transport and should be accessible by modes other than the car. The impact of traffic on tourism assets can be substantial and can vary in severity according to season, the weather, etc. The impact of construction traffic can be a particular concern in tourism sensitive areas in terms of noise pollution and visual impact. The construction programme of developments should work to avoid peak tourism periods in tourism areas and should consider planned or anticipated tourism events and festivals.

Cultural Heritage

Cultural heritage can be a key component of tourism projects and the impact of tourism on the maintenance of cultural heritage should be given the utmost consideration, whether positive or negative. As a tourism attraction, cultural heritage should be strongly considered in non-tourism developments and the impact upon tourism considered as a potential impact.

Archaeology

Archaeology can be of tourism interest and can be an attractive or key component of tourism projects. Archaeology can be a tourism attractor but is generally not kept in situ except in key cases which could also be considered under cultural heritage.

Material Assets; Waste Management

Tourism is a resource heavy activity and can impact waste streams and waste segregation. Impacts here should be considered strongly and with knowledge of the variation that arises from the particular tourist activity. Waste and Waste disposal issues can also impact the perception of an unspoiled environment, effecting tourism, which should be considered.

Material Assets

Material assets are utilities and infrastructure. Tourism itself could be considered a material asset as its impact upon the economy and the infrastructure in place to support it is a material consideration in assessing economic impact.

Landscape

The visual impact of a tourism development, especially in locations which are visually sensitive or renowned for their scenic or landscape beauty, should be considered carefully. A

development intended to utilise or enjoy a particular vista or environment should minimise impact upon that environment.

Major Accident and Natural Disaster

There is a requirement for tourist developments to describe expected significant effects on the environment of the proposed development's vulnerability to major accidents and/or natural disasters relevant to it. Where appropriate measures should be identified to prevent or mitigate the significant adverse effects of such accidents or disasters, including resulting from climate change, on the environment and detail the preparedness for the proposed response.

Interaction of Effects

Where two or more environmental impacts combine or interact they should be considered under the prescribed topics. It is best practice to provide a table of interactions within an EIAR or EIAR Screening Report.

Mitigation

Mitigation should follow the hierarchy of minimisation in descending order of preference- Avoid, Reduce, Remedy

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 impact

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.

Remedy any unavoidable significant residual adverse effects on tourism resources or activities.

Mitigation measures must be measurable and achievable within the bounds of the project.

Cumulative Impact

The cumulative impact is that of the project combined with any known likely project which will interact or compound an environmental impact.

Transboundary Impact

Transboundary impacts should be included in EIAR. In the case of tourism, especially international travel, the transboundary impacts may not be proximate to the EIAR site.

8. Sources of information on Tourism

Information available online

Fáilte Ireland

Fáilte Ireland offers detailed research analysis and insights into the Irish Tourism Industry. The National Tourism Development Authority has a portfolio of research across a number of areas including facts and figures, briefing papers and reports and visitor feedback. The Fáilte Ireland website has a dedicated research library which can be accessed [here](#)

Tourism Ireland

Tourism Ireland is responsible for marketing the island of Ireland overseas as a holiday and business tourism destination. Tourism Ireland publishes a range of research documents including; visitor facts and figures, seasonal updates and industry insights which are accessible [here](#)

Local Authorities

Local Authorities are an invaluable source of information. They produce tourism strategies and audits of tourism assets within their jurisdiction. Local authorities will also produce landscape and seascape studies. Protected views and prospects as well as the record of protected structures and other designated protected buildings are contained within the Statutory Development Plans.

Regional Authorities

Regional Authorities can also be consulted on high level strategic tourism and potential Regional Spatial and Economic Strategies (RSEs) should be consulted.

Central Statistics Office

The Central Statistics Office (CSO) is Ireland's national statistical office and their purpose is to impartially collect, analyse and make available statistics about Ireland's people, society and economy. The Tourism and Travel Section of the Central Statistics Office is the major source for tourism statistics in Ireland and is updated regularly.



David Naughton
MKO
Tuam Road
Galway
H91 VW84

27 August 2021

Re: Proposed Mixed Use Development at Moygaddy Co. Meath
Your Ref: 210414
Our Ref: 21/297

Dear David,

Geological Survey Ireland is the national earth science agency and is a division of the Department of the Environment, Climate and Communications. We provide independent geological information and advice and gather various data for that purpose. Please see our [website](#) for data availability. Use of our data or maps should be attributed correctly to 'Geological Survey Ireland'.

With reference to your letter dated 09 August 2021, concerning the proposed Mixed Use Development at Moygaddy Co. Meath, Geological Survey Ireland would encourage use of and reference to our datasets. Please find attached a list of our publicly available datasets that may be useful to the environmental assessment and planning process. We recommend that you review this list and refer to any datasets you consider relevant to your assessment. The remainder of this letter and following sections provide more detail on some of these datasets.

Geoheritage

Geological Survey Ireland is in partnership with the National Parks and Wildlife Service (NPWS, Department of Housing, Local Government and Heritage), to identify and select important geological and geomorphological sites throughout the country for designation as geological NHAs (Natural Heritage Areas). This is addressed by the Geoheritage Programme of Geological Survey Ireland, under 16 different geological themes, in which the minimum number of scientifically significant sites that best represent the theme are rigorously selected by a panel of theme experts.

County Geological Sites (CGSs), as adopted under the National Heritage Plan, include additional sites that may also be of national importance, but which were not selected as the very best examples for NHA designation. All geological heritage sites identified by Geological Survey Ireland are categorised as CGS pending any further NHA designation by NPWS. CGSs are now routinely included in County Development Plans and in the GIS of planning departments, to ensure the recognition and appropriate protection of geological heritage within the planning system. CGSs can be viewed online under the Geological Heritage tab on the online [Map Viewer](#).

The audit for Co. Meath was carried out in 2007. The full report details can be found at [The Geological Heritage of Meath](#). **Our records show that there are no CGSs in the vicinity of the proposed mix use development.**

Groundwater

Geological Survey Ireland's [Groundwater and Geothermal Unit](#), provides advice, data and maps relating to groundwater distribution, quality and use, which is especially relevant for safe and secure drinking water supplies and healthy ecosystems.

Proposed developments need to consider any potential impact on specific groundwater abstractions and on groundwater resources in general. We recommend using the groundwater maps on our [Map viewer](#) which should include: wells; drinking water source protection areas; the national map suite - aquifer, groundwater vulnerability, groundwater recharge and subsoil permeability maps.



For areas underlain by limestone, please refer to the karst specific data layers (karst features, tracer test database; turlough water levels (gwlevel.ie). Background information is also provided in the Groundwater Body Descriptions. Please read all disclaimers carefully when using Geological Survey Ireland data.

The Groundwater Data Viewer indicates a ‘Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones’ underlies the proposed development. The Groundwater Vulnerability map indicates a range of groundwater vulnerabilities within the vicinity of the proposed development. We would therefore recommend use of the Groundwater Viewer to identify areas of High to Extreme Vulnerability and ‘Rock at or near surface’ in your assessments, as any groundwater-surface water interactions that might occur would be greatest in these areas.

[GWClimate](#) is a groundwater monitoring and modelling project that aims to investigate the impact of climate change on groundwater in Ireland. This is a follow on from a previous project (GWFlood) and the data may be useful in relation to Flood Risk Assessment (FRA) and management plans. Maps and data are available on the [Map viewer](#).

The Groundwater Protection Response overview and link to the main report is here: <https://www.gsi.ie/en-ie/programmes-and-projects/groundwater-and-geothermal-unit/projects/protecting-drinking-water/what-is-drinking-water-protection/county-groundwater-protection-schemes/Pages/default.aspx>.

Geological Mapping

Geological Survey Ireland maintains online datasets of bedrock and subsoils geological mapping that are reliable and accessible. We would encourage you to use these data which can be found [here](#), in your future assessments.

Geotechnical Database Resources

Geological Survey Ireland continues to populate and develop our national geotechnical database and viewer with site investigation data submitted voluntarily by industry. The current database holding is over 7500 reports with 134,000 boreholes; 31,000 of which are digitised which can be accessed through downloads from our [Geotechnical Map Viewer](#). We would encourage the use of this database as part of any baseline geological assessment of the proposed development as it can provide invaluable baseline data for the region or vicinity of proposed development areas. This information may be beneficial and cost saving for any site-specific investigations that may be designed as part of the project.

Natural Resources (Minerals/Aggregates)

Geological Survey Ireland provides data, maps, interpretations and advice on matters related to minerals, their use and their development in our [Minerals section](#) of the website. The Active Quarries, Mineral Localities and the Aggregate Potential maps are available on our [Map Viewer](#).

We would recommend use of the Aggregate Potential Mapping viewer to identify areas of High to Very High source aggregate potential within the area. In keeping with a sustainable approach we would recommend use of our data and mapping viewers to identify and ensure that natural resources used in the proposed development are sustainably sourced from properly recognised and licensed facilities, and that consideration of future resource sterilization is considered.

Geochemistry of soils, surface waters and sediments

Geological Survey Ireland provides baseline geochemistry data for Ireland as part of the Tellus programme. Baseline geochemistry data can be used to assess the chemical status of soil and water at a regional scale and to support the assessment of existing or potential impacts of human activity on environmental chemical quality. Tellus is a national-scale mapping programme which provides multi-element data for shallow soil, stream sediment and stream water in Ireland. At present, mapping consists of the border, western and midland regions. Data is available at <https://www.gsi.ie/en-ie/data-and-maps/Pages/Geochemistry.aspx>. This page also hosts Geochemical Mapping of Agricultural and Grazing Land Soil of Europe (GEMAS) and litho-geochemistry (rock geochemistry) from southeast Ireland datasets.



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications



Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Geological Survey Ireland and partners are undertaking applied geochemistry projects to provide data for agriculture ([Terra Soil](#)), waste soil characterisation ([Geochemically Appropriate Levels for Soil Recovery Facilities](#)) and mineral exploration ([Mineral Prospectivity Mapping](#)).

Other Comments

Should development go ahead, all other factors considered, Geological Survey Ireland would much appreciate a copy of reports detailing any site investigations carried out. Should any significant bedrock cuttings be created, we would ask that they will be designed to remain visible as rock exposure rather than covered with soil and vegetated, in accordance with safety guidelines and engineering constraints. In areas where natural exposures are few, or deeply weathered, this measure would permit on-going improvement of geological knowledge of the subsurface and could be included as additional sites of the geoheritage dataset, if appropriate. Alternatively, we ask that a digital photographic record of significant new excavations could be provided. Potential visits from Geological Survey Ireland to personally document exposures could also be arranged.

The data would be added to Geological Survey Ireland's national database of site investigation boreholes, implemented to provide a better service to the civil engineering sector. Data can be sent to Beatriz Mozo, Geological Mapping Unit, at Beatriz.Mozo@gsi.ie, 01-678 2795.

I hope that these comments are of assistance, and if we can be of any further help, please do not hesitate to contact me Clare Glanville, or my colleague Trish Smullen at GSIPlanning@gsi.ie.

Yours sincerely,

Clare Glanville
Senior Geologist
Geological Survey Ireland

Enc: Table - Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes.

Geological Survey Ireland's Publicly Available Datasets Relevant to Planning, EIA and SEA processes following European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018)

[illegible]

Notes:

1. The maps and data listed above are available on the Geological Survey Ireland map viewer <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>

1. The maps and data listed above are available on the Geological Survey Ireland map viewer <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>.
2. Please read all disclaimers carefully when using Geological Survey Ireland data
3. Geological Survey Ireland and Irish Concrete Federation published guidelines for the treatment of geological heritage in the extractive industry in 2008.

Geology and Ireland

ver



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Environmental Health Department
County Clinic
Navan
Co. Meath
T: 046 9098758
E: meath.peho@hse.ie

MKO Consultants
Tuam Rd
Galway
Ireland
H91 VW84

9th September 2021

Re: HSE SCOPING SUBMISSION REPORT

Dear Sir/Madam,

Please find enclosed the HSE consultation report in relation to the above proposal. The following HSE departments were notified of the consultation request for this development on 11th August 2021.

- Emergency Planning – Brendan Lawlor
- Estates – Helen Maher
- Assistant National Director for Health Protection – Kevin Kelleher/Helen Mulcahy
- CHO – Des O’Flynn

This report only comments on Environmental Health impacts of the scoping request. If you have any queries regarding this report the contact is Ms Elish O’Reilly, Principal Environmental Health Officer, Co. Clinic, Navan, Co. Meath.

Yours sincerely,

A handwritten signature in blue ink that reads 'Elish O'Reilly'.

Principal Environmental Health Officer



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Environmental Health Department
County Clinic
Navan
Co. Meath
T: 046 9098758
E: meath.peho@hse.ie

HSE EIS SCOPING REPORT

Environmental Health Service Consultation Report

(as a Statutory Consultee (Planning and Development Acts 2000,
& Regs made thereunder).

Date: 9th September 2021

Type of consultation: Scoping

Planning Authority: An Bord Pleanála

EHIS Reference: 1908

Applicant: Skycastle Ltd

Proposed Development: Development of site at Moygaddy, Maynooth, Co. Meath. The subject site is comprised of four main parcels of land including; residential units, an office/ tech business park, community infrastructure including a nursing home, primary care centre and public hospital and tourism and amenity centre, including a hotel, retail, sport and leisure facilities and a cultural heritage centre. It is envisaged that the Proposed Development will consist of six to eight separate planning applications for the different aspects of the proposed Moygaddy development. The EIAR will cumulatively assess all elements of the Proposed Development and will be submitted alongside the lodgement of the first planning application for Moygaddy, which is likely to be the nursing home and primary care centre elements of the Proposed Development.

This report only comments on Environmental Health impacts of the proposed development. We have made observations on the following specific areas:

Description of the Project:

The EIAR must fully describe the existing physical environment and detail any potential impacts on the existing environment both during the construction and operational phase of the project.

The design characteristics of the project and the reasons for proposing same should be outlined. It is recommended a diverse variety of household types is provided in the residential development to offer people a range of lifestyle, affordability and lifestage choices. All residential development should incorporate the 'Universal Design' Principle to ensure the housing can meet the needs of the occupants regardless of their age, size, ability or disability.

It is also recommended that the development proposals are assessed to ensure compliance with the objectives of the Meath County Development Plan 2020 -2026.

Later Consents Required:

Information on any possible future monitoring requirements for the proposed strategic urban development should be included in the EIAR.

Consideration of Alternatives:

The EIAR should fully describe and consider any alternatives to this project. The applicant should outline a rationale for the site selection and the proposed scheme design.

Public Consultation:

The EIAR should describe measures the applicant took to inform the public about the project. Details of feedback from the public regarding the proposal should be included within the EIAR. Public consultation should be a two way process between the applicant and the public. The EIAR should clearly demonstrate how the legitimate concerns of the public have been assessed and evaluated and how the outcome of consultation with the public influenced decision making within the environmental impact assessment.

Construction

The construction phase of the development creates the potential for temporary emissions which may have a negative impact on the environment and on the health of local residents. The applicant should assess the impacts of construction works having particular regard to:

- Waste Management,
- Pest Control Management,

- Dust Impacts,
- Excessive Noise
- Emissions to Surface/Groundwater

All sensitive receptors in the vicinity of construction works should be identified and measures implemented to ensure they are protected. It is also recommended a Site Specific Construction Management Plan is prepared and included in the EIAR.

Drainage

Any natural flood plains or wetlands on or in the vicinity of the site should be identified and measures implemented to ensure they are protected from the development. The impact of the proposed Strategic Urban Development on watercourses/wetlands further downstream should be assessed.

An integrated approach to surface water management should be implemented on the site. It is recommended that green space and nature based solutions are provided for the storage and conveyance of rainwater on site and to improve flood mitigation in line with the principals outlined in the Greater Dublin Strategic Drainage Study (SUDS)¹.

Climate

It is recommended the applicant ensures climate considerations are fully integrated into the planning of the strategic urban development and outlines how the proposed buildings contribute to climate action through their design. Specific measures which conserve energy consumption and reduce carbon emissions should be outlined in the EIAR.

The applicant should assess the vulnerability of the proposed development against the predicted impacts of a warming climate and they should predict and should outline proactive adaption measures to ensure the long term resilience of the site infrastructure to the impacts of climate change.

Health

Directive 2014/52/EU has an increased requirement to assess potential significant impacts on Population and Human Health. In the experience of the EHS impacts on human health are generally inadequately assessed in EIA in Ireland. It is recommended that the wider determinants of health and wellbeing are considered. Guidance on determinants of health can be found at www.publichealth.ie

The proposed strategic urban development should be explored for any opportunity to promote physical activity and any potential for health gain should be exploited.

¹ <https://www.sdcc.ie/en/download-it/publications/gdsds-new-development.pdf>

It is recommended that measures to promote walking and cycling throughout the development are implemented along with proposals to ensure the connectivity of the site with the wider urban area. Recreational facilities should be provided to cater specifically for the needs of adolescents and the elderly, along with younger children.

Sustainable transport

The impact of traffic from the proposed Strategic Urban Development should be assessed by carrying out a traffic and transport assessment. An assessment of existing sustainable transport facilities and capacity should also be carried out. It is recommended that the applicant outlines a travel plan for the proposed development which will facilitate and promote the use of public or active transport options for residents.

Landscape

Green recreational space is proven to have positive impacts on health, both physical and mental.² The recent global pandemic has highlighted the importance of access to open green space for recreational purposes for the public. The provision of quality, usable, urban green space is of paramount importance as housing design becomes more compact.

The applicant should assess the impact the proposed Strategic Urban Development will have on existing biodiversity in the area. The applicant should also assess the impact of any possible loss of recreational and amenity green area as a result of the proposed development.

It is recommended that green planting is integrated at all opportunities throughout the development to improve the quality of the built environment and the applicant should outline a diverse range of green spaces for the development in the EIAR. The applicant shall also outline proposals to protect and promote biodiversity on the site.

Noise:

The World Health Organisation (WHO) has identified Environmental Noise as an increasing cause of ill health and detrimental effect on health and wellbeing³.

A full and thorough noise survey must be carried out to assess the impact of noise from the proposed Strategic Urban Development on the residents living in the vicinity. Noise

² Urban Green Space Interventions and Health – a review of impacts and effectiveness, WHO, 2017
https://www.euro.who.int/_data/assets/pdf_file/0010/337690/FULL-REPORT-for-LLP.pdf

³ http://www.euro.who.int/_data/assets/pdf_file/0008/136466/e94888.pdf

from traffic movements or heavy goods vehicles associated with the operation of the development should also be included in the noise assessment.

It is essential that up to date baseline monitoring is carried out to establish the existing noise environment. All noise sensitive receptors in the vicinity of the facility shall be identified. The selection of noise monitoring locations for background noise is of critical importance in the noise survey, therefore the rationale for choosing the number and the positioning of these should be provided by the applicant.

Once the existing noise environment has been established, the predicted increase in noise from the proposed Strategic Urban Development should then be quantified and assessed. It is this department's opinion that adherence to specified noise limit values does not always protect sensitive receptors from noise nuisance therefore the significance of the predicted change in the noise environment should be fully assessed. It is requested that this information is outlined and displayed clearly in the EIAR.

Sustainable Development

The significance of the impact the new Strategic Urban Development will have on the existing town centre of Maynooth should be examined and assessed in the EIAR. The applicant should demonstrate compliance with the Retail Planning Guidelines 2013⁴ and Retail Design Manual 2012⁵ which promote *"town centre vitality through a sequential approach to planning"*.

It is recognised that Maynooth is designated as a strategic development area in the greater Dublin Metropolitan Area. There has already been a large volume of residential development permitted for the Maynooth area. It is imperative that the key infrastructure facilities and amenities currently within the town of Maynooth are examined to ensure the town can sustainably accommodate the proposed increase in residential development.

The cumulative impacts of any other proposed housing developments in the vicinity should also be assessed.



Lisa Maguire
Environmental Health Officer

⁴ <https://www.gov.ie/en/publication/aa2d8-retail-planning-guidelines-april-2012-418-mb/>

⁵ <https://www.gov.ie/en/publication/0b081-retail-design-manual-april-2012/>



Iascach Intíre Éireann
Inland Fisheries Ireland

16/08/2021

RE: EIA Scoping Document for the Proposed Mixed-Use Development at Moygaddy, Co. Meath

Inland Fisheries Ireland is responsible for the protection, management and conservation of the inland fisheries resource. "Fisheries" includes all inland fisheries recreational and commercial, sea angling and mollusc fisheries stipulated under the Fisheries Acts, the physical habitat upon which the fishery relies, the facilities and access, the quantity and quality of the water and the plant and animal life on which fish depend for shelter and food and the spawning areas where in fish deposit their eggs. The protective role of IFI relates to all aspects of the aquatic environment and all factors that influence the biotic communities within waters, which in any way relate to the propagation of fish stocks

The following observations and comments are of necessity of a general nature, while they apply to the proposed development in general, IFI request you have particular regard to the following in the proposed development:

The proposed development is located within the River Ryewater catchment, an important salmonid system. The River Rye Water supports a resident population of Brown trout, a migratory population of Sea trout and importantly a healthy population of the Atlantic salmon. Thus, it is vital to note that salmonid waters constraints apply to any development in this area. The Ryewater also supports populations of Freshwater Crayfish and Lamprey (both Habitats Directive Annex II species). It is also an important spawning tributary of the Liffey. The River Liffey itself is exceptional among most rivers in the area in supporting Atlantic salmon (*Salmo salar*, listed under Annex II and V of the EU Habitats Directive) and Sea trout, resident Brown trout (both *Salmo trutta*) and several other fish species. This highlights the sensitivity of local watercourses and the Liffey catchment in general. The river is regarded as a very important fishery.

IFI's policy is to maintain watercourses in their open natural state in order to prevent habitat loss preserve and enhance biological diversity and aid in pollution detection. An undisturbed buffer zone between development area and the Ryeriver bank should be maximised (10m minimum). The Moygaddy stream which runs through the middle of the site should not be altered or diverted and again an undisturbed buffer zone between development area and riverbank should be maximised. Riparian vegetation should be retained in as natural a state as possible at all times while providing open space and recreational amenity for river users. IFI is strongly opposed to any development on floodplain lands.



Iascach Intíre Éireann
Inland Fisheries Ireland

An Invasive Species and Biosecurity Plan should be included to treat and manage identified invasive species onsite.

Best practice should be implemented at all times in relation to any activities that may impact on surface water. Any discharges to surface streams present on the site must not impact negatively on the salmonid status of the system. Comprehensive surface water management measures must be implemented at the construction and operational stage to prevent any pollution entering local waterways. As specific details of the construction works at this site are as yet unknown IFI are not in a position to comment further on potential impacts

Consultation between the project team and IFI will be essential in order that a fisheries-sustainable solution is arrived at and incorporated in the final works programme.

Pre-construction baseline data (biotic and abiotic) is essential within the EIA process and IFI would be delighted to contribute any information that may be relevant to the fishery section (fish data can be accessed at <http://wfdfish.ie/>). Potential impacts (likely and significant effects) of the development on the system should be comprehensively assessed and recommendations and mitigation measures should be formulated. The identification of good baseline data across a range of sites, both close to the development and at a distance from the site will allow for comparison between the current situation and that which may develop over time if the project proceeds.

IFI have recently published the following guidelines which should also be referred to in the EIAR. They can be accessed on our website www.fisheriesireland.ie :

Revised "Planning for watercourses in the urban environment" which can provide guidance on site specific measures to enhance, protect, rehabilitate or establish riparian and aquatic habitats.

"River Restoration Works - Science based Guidance centred on Hydromorphological Principles in an Era of Climate Change – 2020" has also been published by IFI and describes a framework to plan, design, implement and monitor river restoration projects. A list of best practice riparian and instream measures are presented alongside measures to address channel connectivity and invasive species that are compliant with the EU Water Framework Directive (WFD), other EU Directives and State regulations.



Iascach Intíre Éireann
Inland Fisheries Ireland

I trust you will take our observations on board when compiling the EIAR.

Kind regards,

Roisin O' Callaghan

Fisheries Environmental Officer
Inland Fisheries Ireland - Dublin

Iascach Intíre Éireann
Inland Fisheries Ireland

Telephone: +353 (01) 8842651

Email: roisin.ocallaghan@fisheriesireland.ie

David Naughton

From: INFO <Information@tii.ie>
Sent: Thursday 23 September 2021 10:18
To: David Naughton
Subject: RE: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

You don't often get email from information@tii.ie. [Learn why this is important](#)

Dear Mr. Naughton,

Thank you for your email of 9 August 2021 regarding the above.

TII will endeavour to consider and respond to planning applications referred to it given its status and duties as a statutory consultee under the Planning Acts. The approach to be adopted by TII in making such submissions or comments will seek to uphold official policy and guidelines as outlined in the Section 28 Ministerial Guidelines 'Spatial Planning and National Roads Guidelines for Planning Authorities' (DoECLG, 2012). Regard should also be had to other relevant guidance available at www.tii.ie.

The issuing of this correspondence is provided as best practice guidance only and does not prejudice TII's statutory right to make any observations, requests for further information, objections or appeals following the examination of any valid planning application referred.

With respect to EIAR scoping issues, the recommendations indicated below provide only general guidance for the preparation of an EIAR, which may affect the national road network.

The developer/scheme promoter should have regard, inter alia, to the following:

- TII notes that the subject site accesses the regional/local road network prior to access to the M4, national road, consultations should be had with the relevant Local Authority/National Roads Design Office with regard to locations of existing and future national road schemes,
- TII would be specifically concerned as to potential significant impacts the development would have on the national road network (and junctions with national roads) in the proximity of the proposed development,
- The developer should assess visual impacts from existing national roads,
- The developer should have regard to any Environmental Impact Statement and all conditions and/or modifications imposed by An Bord Pleanála regarding road schemes in the area. The developer should in particular have regard to any potential cumulative impacts,
- The developer, in preparing EIAR, should have regard to TII Publications (formerly DMRB and the Manual of Contract Documents for Road Works),
- The developer, in preparing EIAR, should have regard to TII's Environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (National Roads Authority, 2006),
- The EIAR/EIS should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development will affect future action plans by the relevant competent authority. The developer may need to consider the incorporation of noise barriers to reduce noise impacts (see Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1st Rev., National Roads Authority, 2004)),

• It would be important that, where appropriate, subject to meeting the appropriate thresholds and criteria and having regard to best practice, a Traffic and Transport Assessment (TTA) be carried out in accordance with relevant guidelines, noting traffic volumes attending the site and traffic routes to/from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. In relation to national roads, TII's Traffic and Transport Assessment Guidelines (2014) should be referred to in relation to proposed development with potential impacts on the national road network. The scheme promoter is also advised to have regard to Section 2.2 of the NRA/TII TTA Guidelines which addresses requirements for sub-threshold TTA. Any improvements required to facilitate development should be identified. It will be the responsibility of the developer to pay for the costs of any improvements to national roads to facilitate the private development proposed as TII will not be responsible for such costs,

• The designers are asked to consult TII Publications to determine whether a Road Safety Audit is required,

• In the interests of maintaining the safety and standard of the national road network, the EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network.

• TII recommends that that applicant/developer should clearly identify haul routes proposed and fully assess the network to be traversed. Where abnormal 'weight' loads are proposed, separate structure approvals/permits and other licences may be required in connection with the proposed haul route and all structures on the haul route through all the relevant County Council administrative areas should be checked by the applicant/developer to confirm their capacity to accommodate any abnormal 'weight' load proposed.

The national road network is managed by a combination of PPP Concessions, Motorway Maintenance and Renewal Contracts (MMaRC) and local road authorities in association with TII. The applicant/developer should also consult with all PPP Companies, MMaRC Contractors and road authorities over which the haul route traverses to ascertain any operational requirements such as delivery timetabling, etc. and to ensure that the strategic function of the national road network is safeguarded.

Additionally, any damage caused to the pavement on the existing national road arising from any temporary works due to the turning movement of abnormal 'length' loads (e.g., tearing of the surface course, etc.) shall be rectified in accordance with TII Pavement Standards and details in this regard shall be agreed with the Road Authority prior to the commencement of any development on site.

Designers should consult TII Publications to determine whether a Road Safety Audit is required for any of the temporary works proposed. Any recommendations should be incorporated into designs.

Notwithstanding any of the above, the developer should be aware that this list is non-exhaustive, thus site and development specific issues should be addressed in accordance with best practice.

I trust that the above comments are of use in your EIAR preparation.

Yours sincerely,

Alban Mills

Senior Regulatory & Administration Executive

Ref No. TII21-114295



From: David Naughton <dnaughton@mkofireland.ie>

Sent: Monday 9 August 2021 18:05

To: Landuse Planning <LandUsePlanning@tii.ie>

Subject: 210414 - Scoping Document for Proposed Mixed Use Development at Moygaddy, Co. Meath

CAUTION: This email originated from outside of TII. Do not click links or open attachments unless you recognise the sender and are sure that the content is safe.

Dear Sir or Madam,

Please find attached a cover letter and Scoping Document for a proposed mixed use development in Moygaddy, Co. Meath. The site is located just north of Maynooth town.

As part of the scoping exercise for the proposed development, we would welcome any comments in relation to the proposed project.

If you have any queries, please do not hesitate to contact me.

Kind regards,



David Naughton B.Sc. (Env.)
Environmental Scientist

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APPENDIX 4-1

MOBILITY MANAGEMENT PLAN



OCSC

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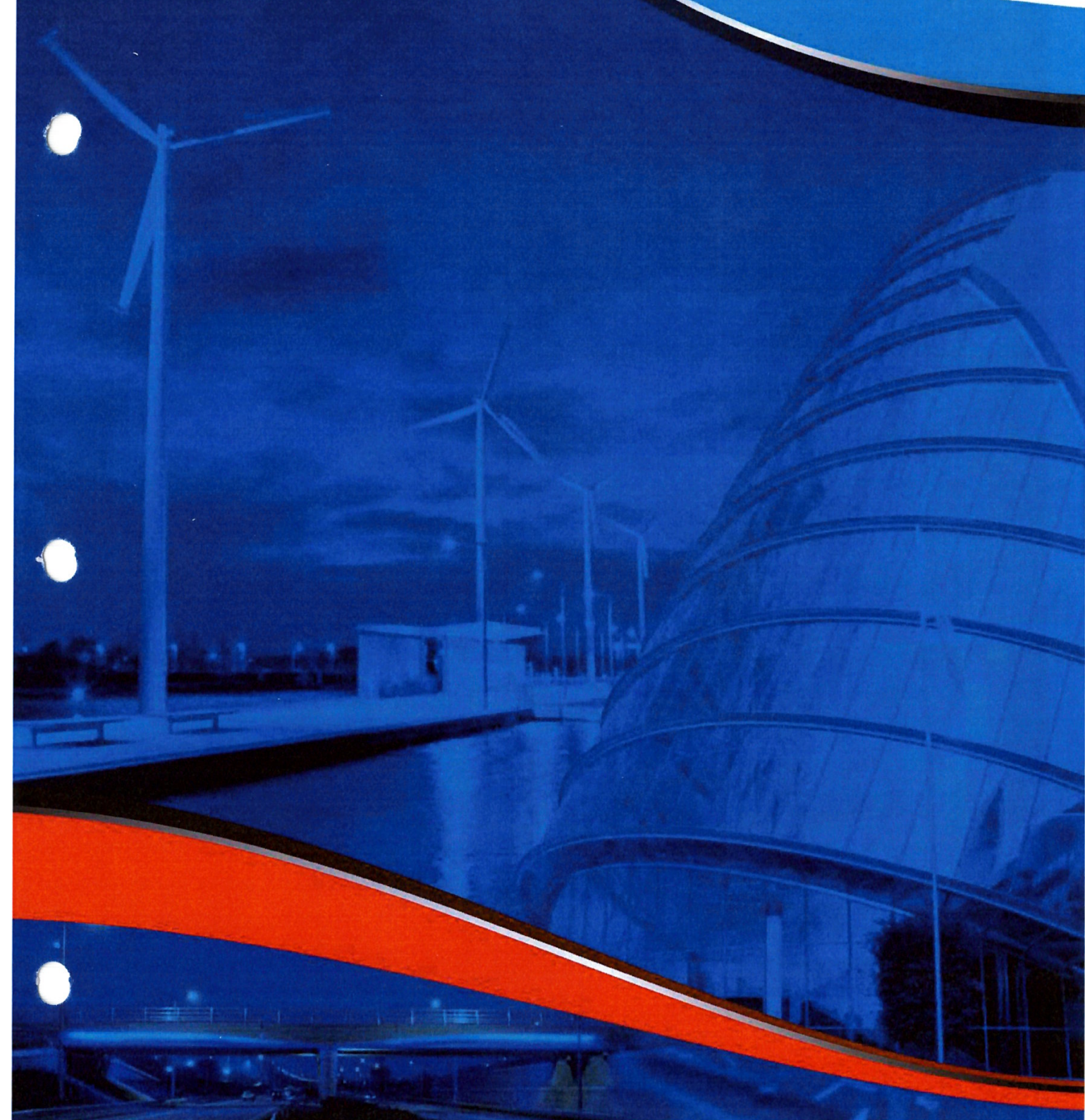
Multidisciplinary
Consulting Engineers

MOBILITY MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME

Sky Castle Ltd
S665

24 August 2022



MOBILITY MANAGEMENT PLAN

Primary Care Centre & Nursing Home

Sky Castle Ltd

S665

24 August 2022

MOBILITY MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME



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DOCUMENT CONTROL & HISTORY

OCSC Job No.: S665	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision
	S665	OCSC	1B	XX	RP	C	0005	S4	P05
Rev.	Status	Authors	Checked	Authorised	Issue Date				
P05	S4	J.Tai	W.Marais	A.Horan	16.08.2022				
P04	S4	J.Tai	W.Marais	A.Horan	29.07.2022				
P03	S4	J.Tai	W.Marais	A.Horan	26.04.2022				
P02	S2	J.Tai	W.Marais	A.Horan	25.03.2022				
P01	S2	J.Tai	S.McGivney	A.Horan	09.12.2021				

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1 INTRODUCTION

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by *Mobility Management Plan* to carry out the Mobility Management Plan associated with the development of a proposed Primary Care Centre (PCC) and a Nursing Home development on lands at Moygaddy, Co. Meath to the west of R157, north of the settlement of Maynooth and west Carton Demesne, Co. Kildare

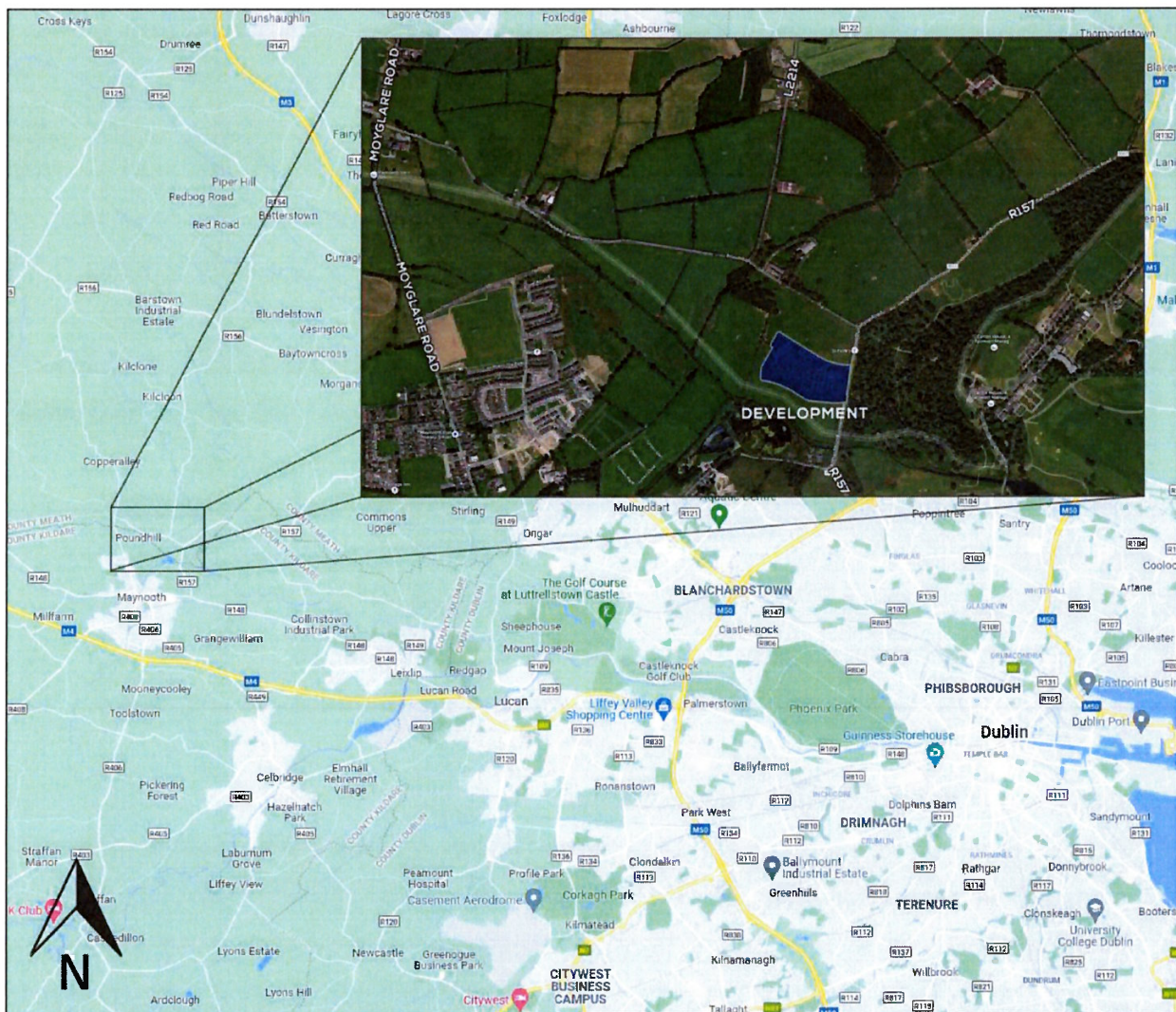


Figure 1: Site Location

The overall gross site area is **c.8-hectares**, and is zoned by Meath County Council for Community Infrastructure in the Adopted Meath County Development Plan 2021 – 2027 and the balance of 5.08 ha zoned is high amenity.

The site is currently greenfield and used for agricultural purposes, and can be accessed from the R157, Maynooth to Dunboyne Road, which aligns the eastern boundary of the subject site.

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.

The proposed development comprises:

1. Construction of a new two-storey Nursing Home of 156 no. bedrooms with a Gross Floor Area (GFA) of 8,576m², including vehicular drop-off area and service road.
2. Construction of a new three-storey Primary Care Centre (PCC) with a Gross Floor Area (GFA) of 3,049m², including vehicular drop-off area.
3. The development includes a shared surface car park providing 161 no. car parking spaces (comprising of 151 no. standard car parking spaces and 10 no. accessible car parking spaces) and approximately 160 no. bicycle parking spaces.
4. Provision of foul and surface water drainage including an underground wastewater pumping station.
5. Connection to potable water supply at Kildare Bridge.
6. Provision of communal (semi-private) and public open space.
7. Provision of hard and soft landscaping including amenity equipment, fencing and gates.
8. Provision of substation and public lighting.
9. Proposed road improvement and realignment works along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556), including:
 - (i) Construction of a new 2-way, 6m-wide access road from the R157 Dunboyne Road to include a priority T-junction on the R157 which includes a right-turn lane from the R157 into the access road,
 - (ii) Upgrade works to a section of the R157 from the new site entrance south to Kildare Bridge on the R157 (representing delivery of a 15m-wide portion of the Maynooth Outer Relief Road (MOOR)), including creation of a new 2m-wide

footpath, 3m-wide cycle lane and pedestrian and cycle link adjacent to Kildare Bridge,

(iii) Provision of pedestrian and cycle improvement measures.

10. All other site development works and services ancillary to the proposed development.

11. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the planning application.

A separate application will be made to the Kildare County Council for the upgrade of the R157 south of the Kildare Bridge. This overlap of applications will ensure unimpeded access to the proposed development lands for all modes of transport including vehicular and dedicated pedestrian and cyclists facilities.

This plan is being prepared as a transportation demand management tool for the site and is aimed particularly at visitors and staff to encourage travel by sustainable modes of transport.

The MMP targets set out herein will take account of future potential improvements in sustainable transport infrastructure over and above those currently in operation.

2 CONTENT OF THE TRAVEL PLAN

The Meath County Development Plan 2021 -2027 considers that a Mobility Management Plan (MMP) is to provide for the achievement of acceptable modal shares for both public and private transport within an appropriate timeframe. In addition, MMP is considered a tool to reduce dependency on private car use by promotion of public transport, cycling, walking and provision of the physical infrastructure to support cycling/walking.

Hence, based on the best practice, this MMP is intended to meet the following requirement,

- Provide a comprehensive outline of public transport services available (proposed and existing);
- Promote alternative sustainable travel options i.e. walking and cycling;
- Prepare a statement on the nature and extent of facilities that will be considered for provision, and that would serve to encourage walking and cycling;
- Provide an outline of various schemes that may be appropriate to facilitate a change in travel patterns to and from work.

Based on the above, this report is a statement of the broad objectives in respect of Mobility Management for the site as a whole. The plan sets out targets and objectives along with the mechanisms, including both hard and soft measures, which could be put in place to support the modal shift.

However, at this stage, the plan is intended to be preliminary and will be revised accordingly once more detailed information regarding the final occupiers becomes available. Moving forward from this, the plan will continue to be regularly updated based on experience gained from its implementation and operation.

3 EXISTING PUBLIC TRANSPORT, CYCLE & PEDESTRIAN FACILITIES

The proposed development site is considered to be located within walking distance of the town centre of Maynooth which is well serviced by several existing public transport options. In addition, the patients and workers of the proposed development site will be enabled to conveniently access the Maynooth Town centre by foot via the existing pedestrian access on Carton Avenue.

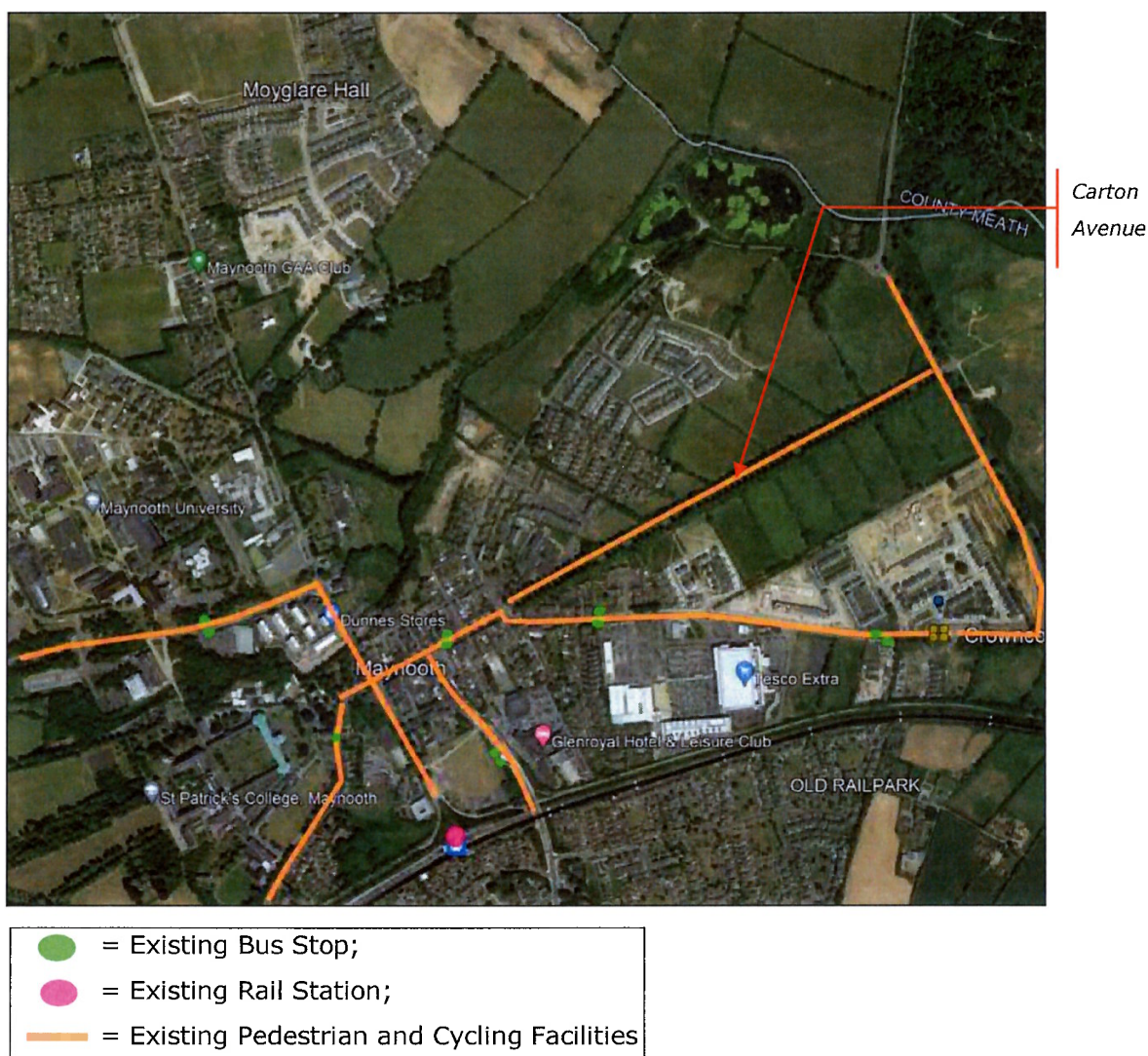


Figure 2: Overall Existing Facilities in Local

EXISTING BUS SERVICES

The closest existing bus stop to the development site is a 16-minute walk (1.3km) from the proposed site. Routes serving this location along the R148 include several Dublin Bus services including the 66, 66x, C3, C5, X25, and X26 as well as route 139 which is operated by JJ Kavanagh & Sons. The existing bus routes in this service stop will link the proposed development to Blanchardstown, Maynooth, Clane, Sallins and Nass General Hospital. In addition, dedicated Bus Éireann stops are located opposite the Glenroyal Hotel in Maynooth town centre is a 22-minute walk (1.8km) from the proposed site that provides access to several Bus Éireann routes including 20 (Galway – Dublin City – Dublin Airport), 22 (Ballina – Dublin Airport), 23 (Sligo – Dublin Airport), 115 (Mullingar – Dublin).

The key routes serving the bus stop within a short walk of the development site are summarised in the table below.

Route	Description
Route 66	Merrion Square – Maynooth
Route 66x	Maynooth – UCD Belfield
Route 139	Naas – Blanchardstown
Route 115	Mullingar – Kinnegad – Engield – Kilcock – Dublin
Route 115c	Mullingar – Kinnegad – Engield – Kilcock – Dublin
Route C3 / C5	Maynooth – Ringsend
Route 20	Galway – Dublin City – Dublin Airport
Route 22	Ballina – Dublin Airport
Route 23	Sligo – Dublin Airport

Table 1: Local Bus Services

The above services are operated by Dublin Bus, Bus Éireann and JJ Kavanagh & sons. More details of these bus services can be found at www.dublinbus.ie, www.buseireann.ie & jjkavanagh.ie.

It is expected that the future staff and visitors can utilise the existing bus routes to travel to/from the development site from/to other local areas of residential via the Maynooth Town Centre.

EXISTING RAIL SERVICES

The proposed site will be a 26-minute walk (2.1km) from Maynooth Train Station via the existing pedestrian access in Carton Avenue that provides convenient access to the Dublin Sligo railway service line that provides intermediate stops at Carrick on Shannon, Longford, Mullingar, Enfield, Leixlip, Clonsilla, Drumcondra.

More details of the existing rail service can be found at www.irishrail.ie.

The imminent DART+ Programme will also provide higher frequency connections and capacity to the Maynooth line connecting to Dublin Connolly & the proposed Spencer Dock stations. The further improvement of the current railway line will be covered in this report later.

EXISTING CYCLE FACILITIES

Existing cycling infrastructure in Maynooth is currently confined to the town centre only. Within Maynooth Town Centre there is a mix of on and off-road cycle tracks, as outlined with Green Line in the figure below.

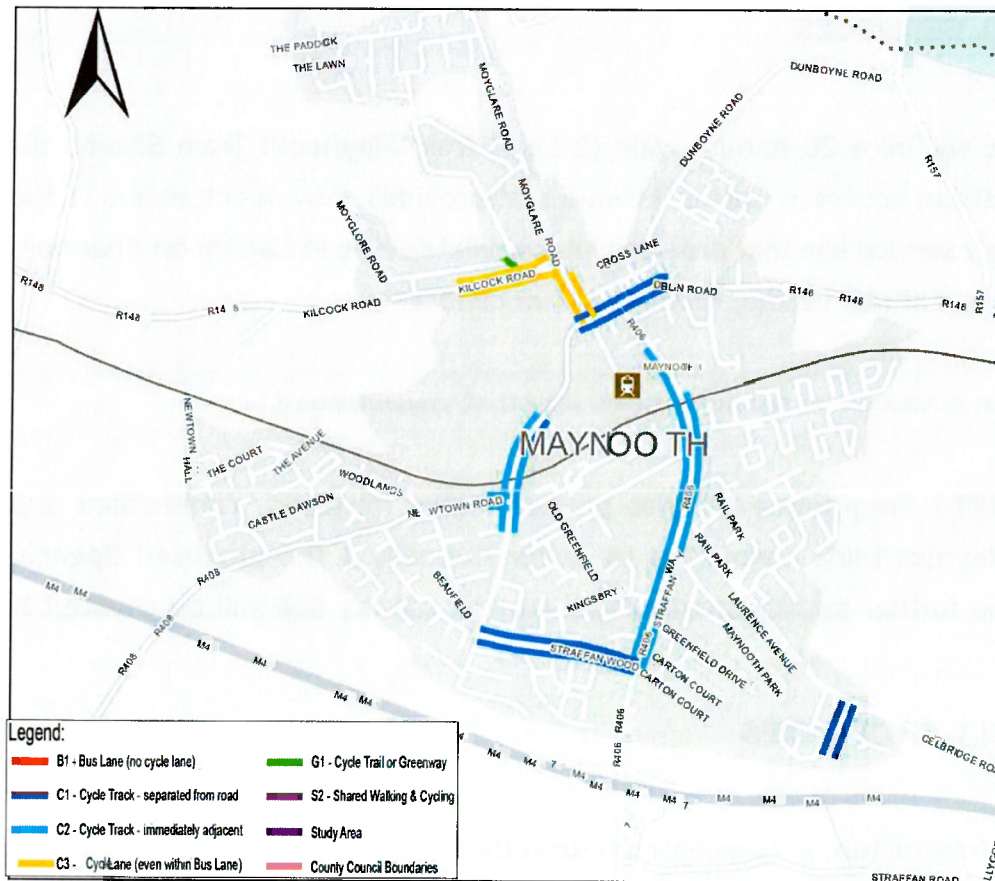


Figure 2: Existing Cycle Facilities Locally

It is also noted that the Maynooth Eastern Relief Road (MERR) was granted planning in 2019 that will provide additional cycle and pedestrian infrastructure for 1.55 km along the eastern boundary of Maynooth. The location of the MEER can be seen in Figure 4 overleaf.



Figure 3: Maynooth Eastern Relief Road

Hence, it is expected that future staff and visitors will consider cycling as an attractive travel option to/from the development site.

Further details of improvement on the existing cycle facilities are covered in Chapter 4 of this report.

EXISTING PEDESTRIAN FACILITIES

In terms of pedestrian access, there is existing dedicated pedestrian access to Maynooth via Carto Avenue, which is located within 400m (5 minutes) walking distance of the

proposed development. The pedestrian access route to Maynooth Town Centre via Carton Avenue from the proposed development can be seen in the figure below.



Figure 5: Existing Pedestrian Access Route Via Carton Avenue

Within Maynooth Town Centre, there are several public transport service stops. It is expected that future visitors and staff will consider travel on foot from/to the proposed development to/from the existing public transport service stops which are located in Maynooth Town Centre.

The existing segregated pedestrian access in Carton Avenue that will link the proposed development to Maynooth Town Centre is considered good quality public access, which will enable future visitors and staff access to the nearby bus stops and the town centre.

The existing pedestrian facilities in Carton Avenue can be seen in the figure below.



Figure 6: Entrance of Existing Pedestrian Access on Carton Avenue



Figure 7: Exit of Existing Pedestrian Access on Carton Avenue

4 FUTURE PUBLIC TRANSPORT, CYCLE & PEDESTRIAN FACILITIES

Several future public transport schemes are planned for the local Maynooth area that will improve sustainable transport options locally and make them a more attractive travel option. These future transport options include:

BUSCONNECTS

Bus Connects aims to overhaul the current bus system in the Greater Dublin region by building a network of next-generation bus corridors on the busiest bus routes to make bus journeys faster, predictable and more reliable.

Relative to the development site, the most relevant is the proposed C – Spine route of the proposed New Dublin Area Bus Network which will travel from Maynooth to Dublin City Centre and on to Ringsend, this route will have a frequency of 30 mins. In addition, there will be an orbital route W8 peak time routes 325, and 326 servicing the vicinity of the proposed development site. The W8 orbital route will be a short 900m (12 minute) walk from the proposed development site. The proposed BusConnects services in the Maynooth area can be seen in Figure 5.

It is noted that the applicant has written to the NTA / Busconnects to provide outcome notification of the proposed development and a copy of the letter can be seen in Appendix A of this report.

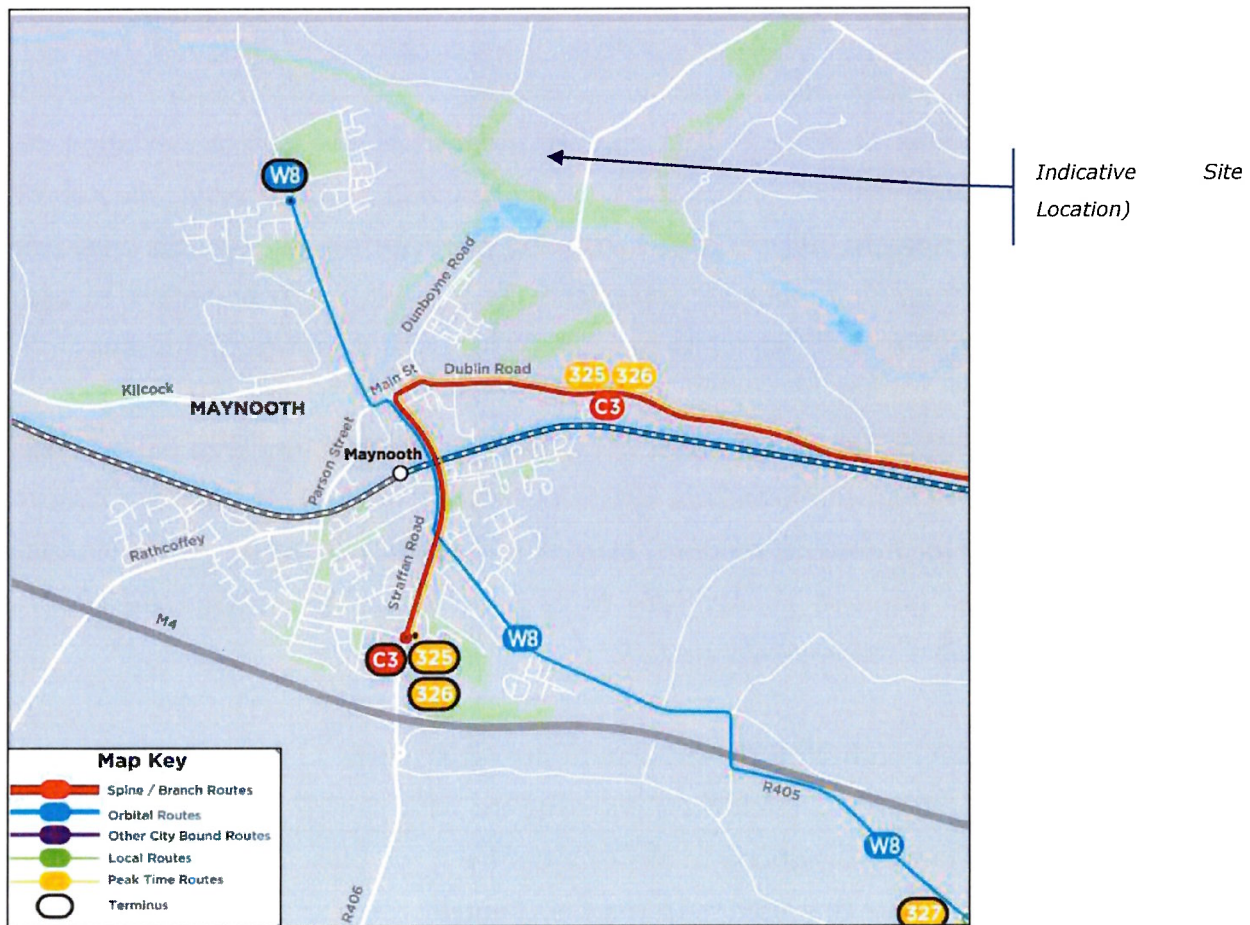


Figure 4: Proposed Bus Connects Services

It is envisaged on completion of the Maynooth Outer Orbital Route that additional public and private bus services will establish new routes in the area to serve the new developments. Details of these new routes are not yet available, however, it is the applicant's intention to liaise with these bodies to ensure that connectivity is enhanced as part of the masterplan strategy.

It is shown that these proposed service routes will significantly enhance the connection and reduce travel time between the proposed development and the main destinations such as Maynooth Town Centre and Dublin City Centre.

Further details of the improvement can be found at www.BusConnects.ie

DART+ PROGRAMME

DART+ is a programme of projects that aims to modernise and improve existing rail services in the Greater Dublin Area (GDA). It will provide a sustainable, electrified, reliable and more frequent rail service, improving capacity on rail corridors serving Dublin. It will see the DART network grow from its current 50km in length to over 150km. Bringing DART travel with all its benefits to new and existing communities.

It will promote multi-modal transit, and active transport, boost regional connectivity and make public transport the preferred option for more and more people. The DART+ Programme will deliver frequent, modern, electrified services within the Greater Dublin Area (GDA) and will improve connectivity to Regional towns and cities. The DART+ Programme will involve rail improvements from:

- DART+ West - Maynooth and M3 Parkway to the City Centre
- DART+ South West - Hazelhatch & Celbridge to the City Centre
- DART+ Coastal North - Drogheda to the City Centre
- DART+ Coastal South - Greystones to the City Centre
- DART+ Fleet - purchase of new train fleet to increase train services.

The DART+ Programme envisages the upgrade and enhancement of services on the Maynooth line that will deliver frequent, modern, electrified services to/from Dublin City Centre (Connolly and Spencer Dock) to:

- Maynooth and M3 Parkway;
- Hazelhatch and Celbridge;
- Drogheda; and
- Greystones

The DART+ Programme map can be seen in *Figure 6* overleaf.

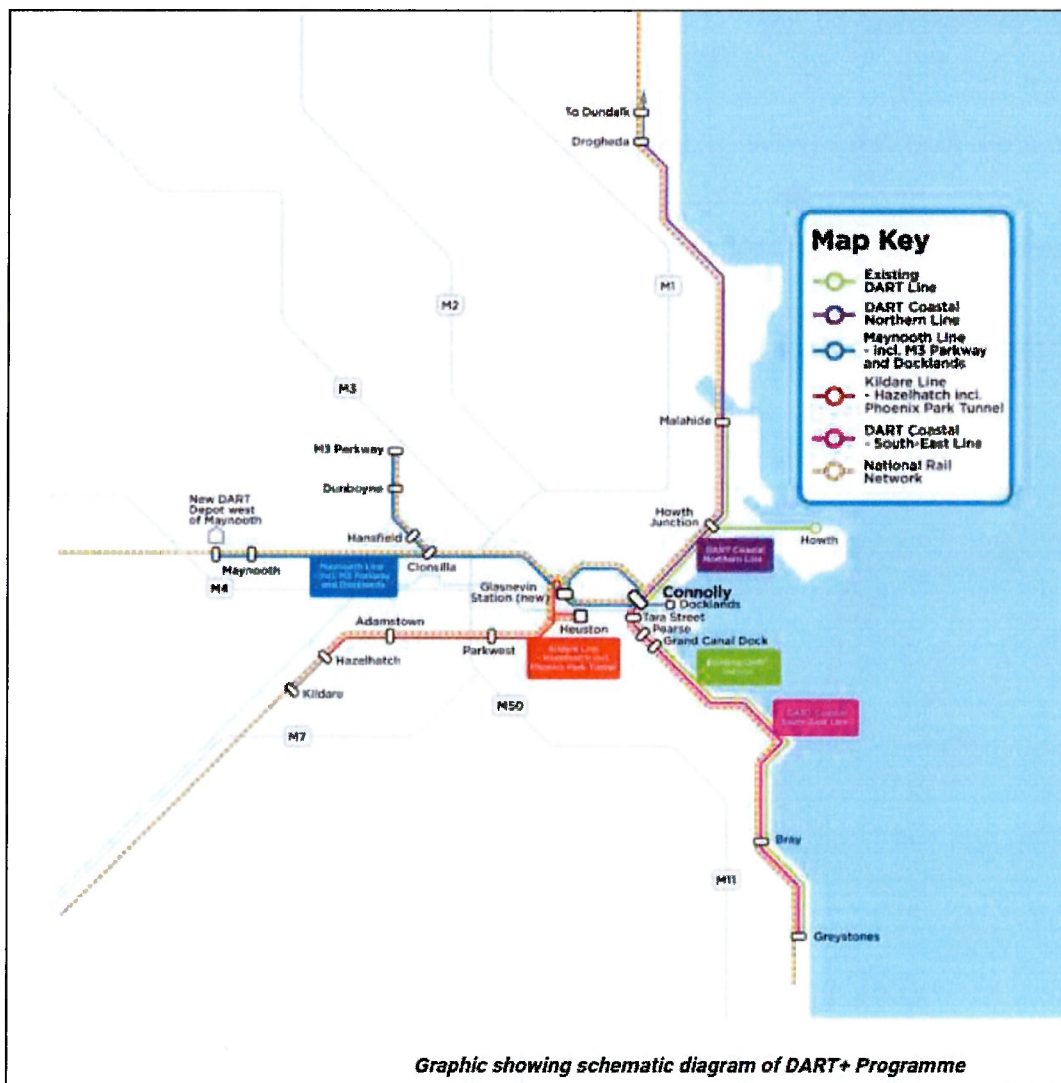


Figure 5: DART + Programme

As noted previously, Maynooth is currently serviced by an intercity rail service, with connecting services to Dublin City Centre. However, the DART+ Programme will provide for increased capacity and frequency of the Maynooth existing rail line. The DART+ Programme will increase the accessibility of the proposed development to sustainable modes of transport and will make this an attractive alternative to travel.

Irish Rail has confirmed that the Railway Order application for DART+ WEST is set to be lodged on 29th July 2022, seeking permission to extend the current network to the west of Maynooth, and to M3 Parkway. It is anticipated that construction will commence in 2024 and will enter into operation in 2029.

GDA CYCLE NETWORK PLAN

National Transport Authority (NTA) published the "Greater Dublin Area Cycle Network Plan (GDA)" which focuses on the enhancement and extension of the cycling infrastructure across Dublin. Further proposals for the local areas are outlined overleaf.

Further cycle proposals in the local area are shown following with the development site indicatively circled in red.

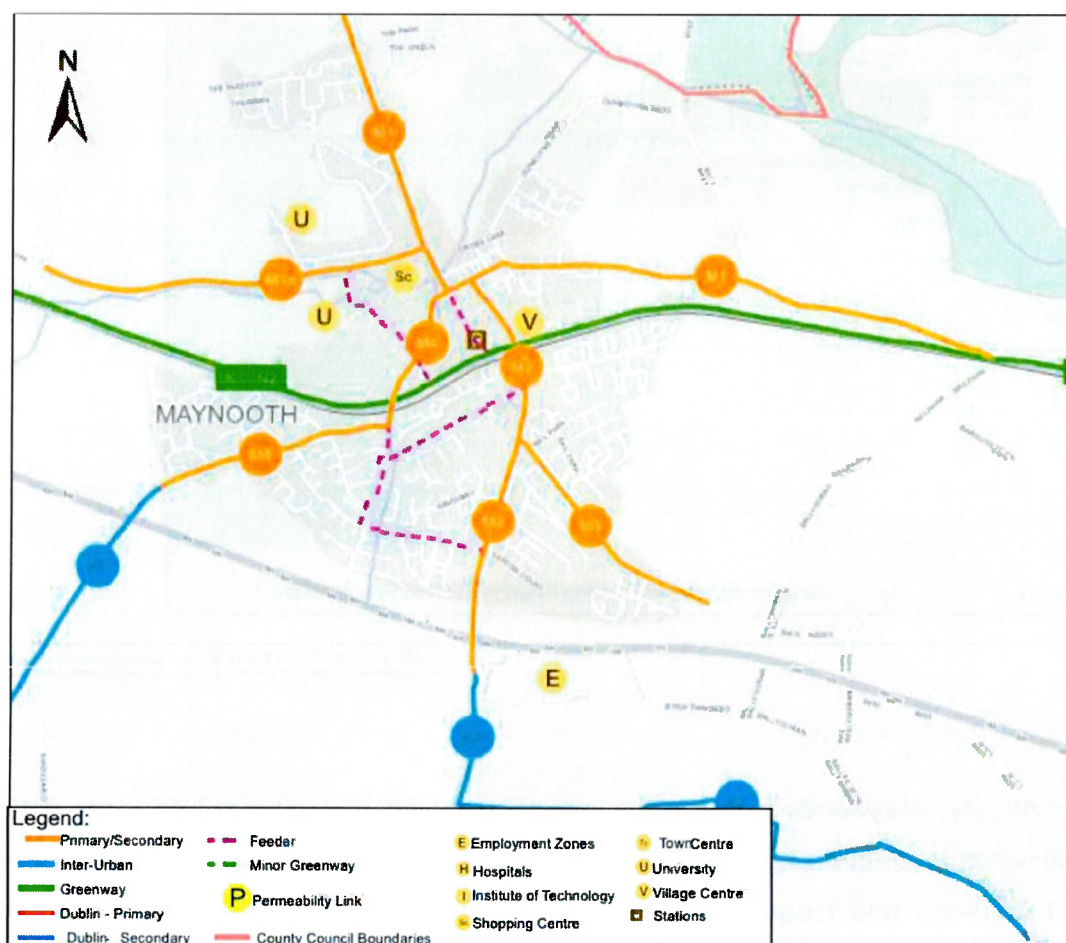


Figure 6: Proposed Cycle Network

Shown in Figure 6 is an extract from the GDA Cycle Network Plan, showing that several cycle facilities are proposed close to the development site. Under this cycle network proposal, it is proposed to build a primary/secondary cycle route (M1) that will connect the new Maynooth Outer Orbital Route (MOOR) to Maynooth Town Centre and ensure

the development can be accessed via alternative sustainable modes of transport. It is noted that a new dedicated cycle track will be provided along the R157 from Kildare Bridge, south of the development site to the site entrance junction and forms part of the future cycle network in local areas.

It is clearly shown that these additional new cycle routes will greatly improve the local cycle infrastructure and will make cycling a more attractive option.

Taking the above into consideration, the site is accessible by a wide variety of transportation options which will facilitate a modal shift away from private car travel.

5 CAR PARKING STRATEGY

In developing the car parking provision, consideration has been given to a wide variety of factors including the applicable standards, realistic demand, and measures that can be put in place to manage and control parking at the PCC/Nursing Home site. Each of these factors is discussed in further detail as follows:

CAR PARKING STANDARDS

The development is primarily located within the jurisdiction of MCC, however, the Maynooth Environs Local Area Plan contains an objective to liaise with KCC in the identification, design, reservation and delivery of the section of the Maynooth Outer Relief Road located within the administrative area of MCC. However, as this application is located solely within the MCC jurisdiction, this report will only reference the parking standards of the MCC Development Plan.

The latest *Meath County Development Plan 2021 – 2027* plan was adopted on 22 September 2021 and came into effect on 3 November 2021.

The *Meath County Development Plan 2021 – 2027*, Section 9 – Parking Standards, Table 11.2, notes that the County requires 1 car parking space per 3 beds, and one space per employee for Nursing Homes. There is no specific reference within the Development Plan parking standards for a land-use such as a Primary Care Centre. However, the Development Plan does state that “in the case of any specific uses not listed in the above table, Meath County Council will specify its requirements in relation to parking”. For the purposes of this document, the most appropriate comparable standard was chosen as the land use “Surgeries” for use with the PCC. This states that 2 car parking spaces are required per consulting room.

From this, the following requirements in terms of car parking were calculated according to the Development Plan:

Land-Use	Unit		Requirement
Nursing Home	156	Beds	52 ¹
Primary Care Centre	48	Consulting rooms	96
Total			148

¹Excluding car parking for employees

Table 2: Car Parking Requirements

CAR PARKING PROVISION

The development will provide the following car parking spaces:

- 10 no. universally accessible spaces
- 147 no. standard spaces
- 4 no. EV spaces
- 161 no. total spaces

The provided car parking is in line with the requirements for the nursing home, with an adequate provision made given the number of beds. At this stage the number of staff required for the development is unclear, but it should be noted that the provision is considered adequate for the number of staff and will not result in an over provision of car parking that could cause the development to become car park dominated. This approach encourages dual usage of car spaces and the use of more sustainable modes of transport. Further to this, the following should be noted:

- The standards taken from the Development Plan are set as "maxima" per land use, with the car parking standards to be applied at the discretion of Meath County Council;
- The car parking demand for the two parts of the development, Nursing Home and PCC, will vary throughout the day. Generally, activity at Nursing Homes is higher in the evenings and weekends, during visiting hours. The PCC will be more active throughout weekdays as appointments are scheduled throughout the day. Therefore there is some potential for dual usage of car parking spaces, which will ensure that an over-provision and underutilisation of car parking doesn't occur;
- Lastly, there is an element of cross usage such as internal trips between the Nursing Home and PCC that do not require car parking or only require one space for both

parts of the development. It is expected that the co-location of these two important community medical infrastructure buildings will further reduce the requirements for car parking spaces between the two sites.

The provision is a slight reduction on the maxima standards set out within the *Meath County Development Plan*, but it is submitted that this is an appropriate car parking strategy that allows for the highly accessible nature of the site and the dual usage nature of the Primary Care Centre and the Nursing Home which are compatible and complementary medical uses on a co-located site. EV spaces have also been provided in line with the development plan standards, which state that a total of 4 no. EV charging points should be provided per development.

BICYCLE PARKING

In the interest of sustainable transport, extensive, high-quality cycle parking is proposed at the development. The Meath Development Plan doesn't have a specific standard for Nursing Home or Primary Care Centre, rather the appropriate standard is for "Other Developments". This states that 1 bike space is required per car space, or 10% of employee numbers in general. As the former will be the greater value, this was chosen as the accepted standard. Given this, the development provides for a total of 160 no. cycle spaces. The current quantum of cycle parking satisfies the requirements of the Local Development Plan.

6 OBJECTIVES OF THE TRAVEL PLAN

This MMP sets out targets and objectives along with the mechanisms, including both hard and soft measures, which could be put in place to support the modal shift of future residents.

At this stage, the plan is intended to be preliminary and will be revised accordingly once the development is occupied. Moving forward from this, the plan will continue to be regularly updated based on experience gained from its implementation and operation.

CAR TRAVEL & OCCUPANCY

It is an objective of this plan to maximise the number of people travelling by sustainable means and, where travel by private car does occur, maximise the number of people travelling as passengers.

BUS USAGE

As noted in Section 3, the existing service bus route is available for future staff and visitors to use as their daily commuter. It is an objective of this plan to increase awareness of these services and encourage their use as a viable and convenient alternative to private car travel where possible. It is also an objective to inform staff and visitors about any changes to these services and any new services that come on line.

CYCLING & WALKING

There is a good quality pedestrian and cycling infrastructure proposed in the vicinity of the proposed development. As mentioned earlier, the scheme will have new cycle facilities which link the development site to further areas. It is an objective of this plan to promote cycling/walking as viable means of transport and to facilitate their use wherever possible.

MODAL SPLIT

Considering the level of public transport, cycle & pedestrian infrastructure locally, the following preliminary modal split targets for the operational stage have been established.

Mode	Modal Share
Walking	20%
Bicycle	5%
Public Transport	15%
Car Driver	55%
Car Passenger	5%

Table 3: Preliminary Target Modal Split

Hence, the detailed travel survey is planned to be carried out after 6 months once the development is occupied to facilitate a more accurate analysis of staff and visitors' travel patterns.

7 SPECIFIC MEASURES

In order to achieve the objectives and modal split targets set out in *Section 5*, a number of specific measures are proposed to be put in place.

MANAGEMENT & COORDINATION

A Mobility Manager/Travel Coordinator is suggested to be appointed after the development is completed. The duties of the Mobility Manager will include inter alia:

- Conducting surveys at regular intervals once the development is completed and operational. These surveys will provide detailed and up-to-date information on travel habits which can be used to develop new strategies that encourage travel by alternate modes;
- Implementation of various schemes/plans aimed at encouraging the uptake of more sustainable means of travel;
- Acting as an information point;
- Negotiating with public transport companies and other service providers;
- Branding of the plan;
- Ongoing promotion and marketing of the plan through various mediums;
- Evaluation and adaptation of the plan in light of experience.

CAR SHARING

The appointed Mobility Manager will ensure that car sharing will be promoted throughout the development via schemes such as establishing a car sharing database. The staff and visitors will be able to avail of this service to get in contact with other people who are travelling to and from similar destinations to share the costs and increase the number of people travelling as passengers.

BUS USAGE

The appointed Mobility Manager will encourage and facilitate the use of the numerous existing bus facilities operating in the local area and any future services.

Timetables and information on routes, ticket prices etc. will be kept on hand at all times for staff and visitors. The appointed Mobility Manager will also promote and distribute information on any special tickets available such as tax-saver tickets, integrated ticket systems etc. on an ongoing basis. All information will be updated regularly for visitors and workers.

The appointed Mobility Manager will also keep in contact with all bus service providers working in the area to improve/create new services locally where possible. Furthermore, the possibility of having local service providers set up on-site at various times to promote their services and any special offers available will also be investigated.

CYCLE & PEDESTRIAN FACILITIES

The site Mobility Manager will continue to promote cycling through various schemes and promotions which may include:

- 'Bike to Work';
- Cycle safety training;
- Site visits from trained mechanics to check/repair workers' bikes;
- Discounts on bikes and accessories from various stores;
- Provision of high visibility vests.

Similarly, walking will also be promoted through various schemes such as the Pedometer Challenge, as part of the Smarter Travel WorkPlace programme.

WELCOME PACK

The visitors and workers of the development could likely be provided with a simple Welcome Pack upon visiting or working in the proposed development. The Welcome Pack will contain a high-quality map of the neighbourhood, showing cycling, walking and public transport routes to key local facilities, plus current timetables for local bus and rail services. A key role of the welcome pack will also be to raise awareness of the sustainable travel initiatives being implemented through the Travel Plan including:

- *Promotion of key services and facilities* – Full details of the key services and facilities provided by the travel plan will be included within the Welcome Pack;
- *Promote Cycling* – Full details of the local cycle network to be included within the Welcome Pack
- *The promotion of additional schemes* – There are several additional schemes which could be hugely beneficial in encouraging travel by more sustainable means. These include, but are not limited to:
 - Bike Week includes several events designed to cater for all cyclists regardless of experience;
 - World Environment Day is an annual event aimed at educating people about environmental issues and positive actions that can be taken in that regard;
 - Car Free Day focuses on raising the awareness of urban dwellers concerning nuisances caused by the use of private cars while also promoting the rights of pedestrians and cyclists and the need for improved public transport.

The Welcome Pack will also invite those persons wishing to raise specific transport-related matters to discuss them with the appointed Mobility Manager for consideration. The appointed Mobility Manager will also be able to provide personalised travel planning advice to visitors and workers if required.

USE OF TECHNOLOGY

Recent advancements in technology present several additional opportunities to encourage positive modal shifts. As part of this MMP, visitors and workers at the

completed development will be informed of a variety of potentially useful tools including the following:

- *The NTA Journey Planner* – Available on the NTA website and as a downloadable app, the journey planner provides a comprehensive list of travel options available from any origin/destination point in the country. Most notably, this is not limited to a single mode of travel and includes routes that consider multiple modes and multiple public transport services while also providing details such as journey times and distances for each option;
- *Public Transport Providers* – Each of the major public transport providers, including Dublin Bus, Bus Éireann and Irish Rail, now have dedicated apps that can be downloaded to a smartphone and/or tablet. These contain detailed information on all services offered including timetables and also allow for real-time updates on changes or disruptions to services;
- *RealTime Ireland* – An application available for download to smartphones and tablets, this app provides real-time arrival and departure listings for a range of public transport options from major rail stations to individual bus stops. This app also links with the aforementioned NTA Journey Planner to provide a comprehensive travel planning tool.

The above are just a few examples of the services available which would be of significant use in promoting more sustainable means of transport. The availability of such services will be promoted amongst visitors and staff alike regularly and information on any new services that become available will also be provided.

8 SUMMARY

Overall, the location of the proposed development, along with the measures considered, will aim to reduce the number of private car users and encourages the staff and visitors to travel by public transport, by bike or by foot.

9 PHASING & MONITORING

A critical part of any MMP is ongoing monitoring. It is proposed that an initial evaluation of the operation of the plan will take place 6 months into its operation. The plan will be appropriately adjusted at that stage based on the results.

The MMP will be monitored and regularly reviewed on a minimum yearly basis with regular travel surveys being carried out. In general, the overall plan will be refined based on experience and consultations with the respective stakeholders.

10 VERIFICATION

This report was compiled and verified by:

Joshua Tai BE, MIEI

Civil Engineer

O'Connor Sutton Cronin & Associates



Appendix A **BUSCONNECTS SUBMISSION LETTER**

Bus Connects
National Transport Authority
Dún Scéine
Hardcourt Lane
Dublin 2
D02 WT20

15/11/2021

Ref: T-SMG

Project No. S665



RE: Maynooth Transport Strategy (MTS)
Our Client; Sky Castle Limited
Maynooth Environs – Lands At Moygaddy, Co, Meath, Maynooth

Dear

We are writing to draw your attention to our client's submission to the Maynooth Transport Strategy (MTS) review initiated by Kildare County Council.

We enclose a copy of the submission to the MTS for your information.

We would like to draw your attention to the opportunity to expand the public transport network to include Bus Connects as part of the strategic Residential and Employment lead developments proposed on our client's landholding at Moygaddy Co. Meath which forms part of the Maynooth Environs.

We would welcome the opportunity to speak with you about this initiative and we look forward to your feedback in early course
Yours sincerely

Shane McGivney
Chartered Engineer
For O'Connor Sutton Cronin

CC. Ronan Barrett, Sky Castle Limited

cc. Meath County Council

cc. Kildare County Council



Civil | Structural | Mechanical | Electrical | Sustainability | Environmental

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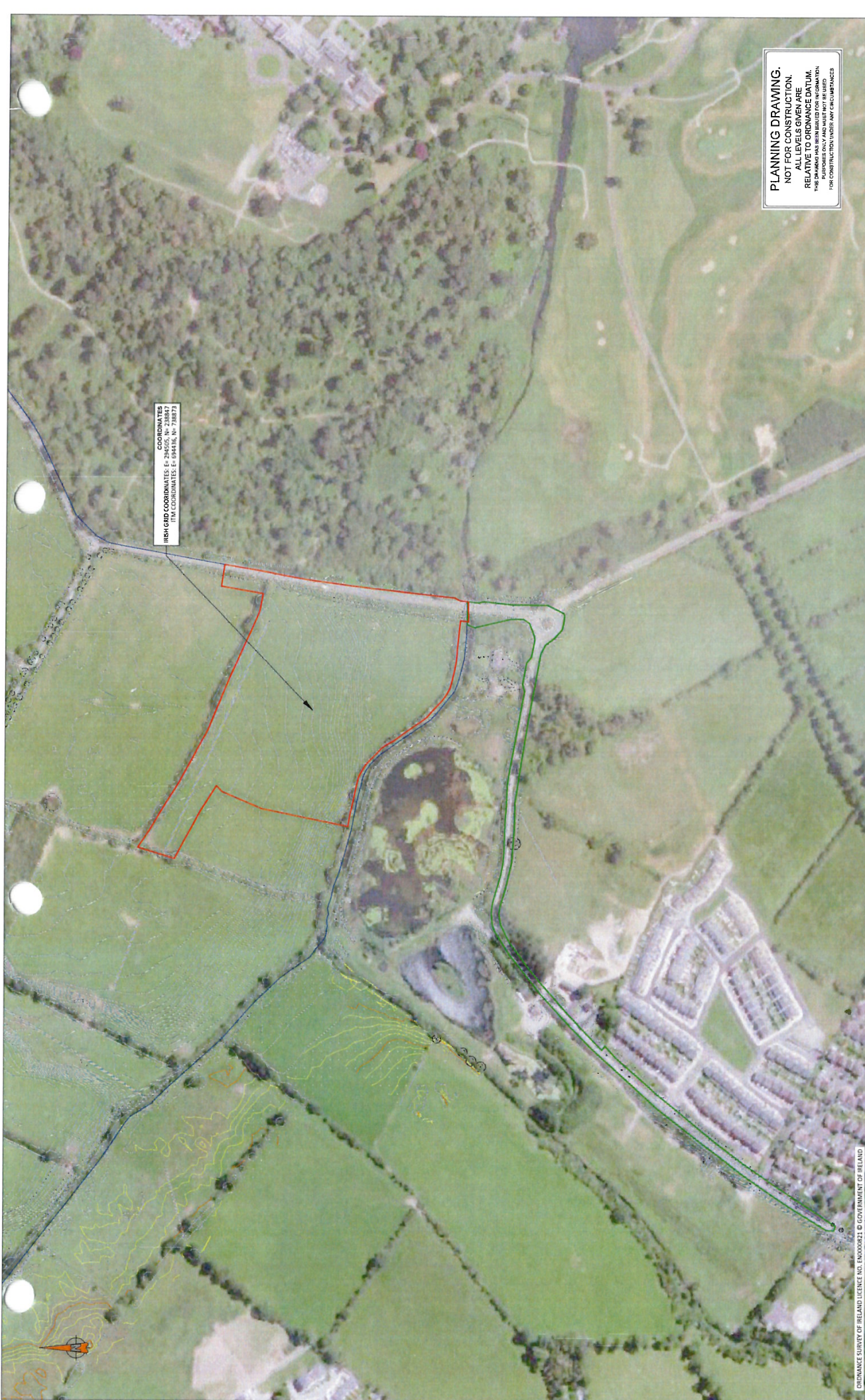
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APPENDIX 4-2

**SITE LAYOUT PLANNING
DRAWINGS**

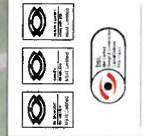


COORDINATES
IRISH GRID COORDINATES: E: 245025, N: 738873
ITM COORDINATES: E: 694436, N: 738873

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Client: SKY CASTLE LTD
Project: PRIMARY CARE CENTRE & NURSING HOME
Type: SITE LOCATION
Code: Original: Zone: 1 Level: 1 Role: Number: 1 Status: Revision:
5665 - OCSC - 1B - MH - DR - C - 0100 - S4 - P05
Date: NOV '21 Scale: 1:1000@A1 Dn by: RM Cld by: MK

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PD2	30/03/22	FOR INFORMATION	RM	SMG
PD3	07/06/22	FOR PLANNING	RM	WM
PD4	27/07/22	FOR PLANNING	RM	WM
PD5	25/08/22	FOR PLANNING	IC	WM

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LEGEND:

- SITE BOUNDARY (CO. MEATH)
- WORKS WITHIN CO. WILDALE
- MASTER PLAN BOUNDARY
- TWIN HOPE RISING MAIN
- UPVC SNE WASTEWATER DRAINAGE OR SIMILAR APPROVED
- 1200mm WASTEWATER DRAINAGE PRECAST CONCRETE MANHOLE
- UPVC TWINWALL SURFACE WATER DRAINAGE OR SIMILAR APPROVED
- 1200mm SURFACE WATER DRAINAGE PRECAST CONCRETE MANHOLE
- 900mm WIDE FILTER DRAIN
- POLY TUNNEL ATTENUATION SYSTEM
- PERVIOUS PAVING (POROUS ASPHALT, OR SIMILAR APPROVED)
- 450mm INSPECTION CHAMBER
- TRAPPED ROAD GULLY
- 1500mm GULLY CONNECTION

GENERAL NOTES:

- ALL NOTED LEVELS ARE TO ORDNANCE DATUM, MAIN HEAD
- REFER TO ARCHITECT'S LAYOUT FOR ALL SET OUT INFORMATION
- REFER TO ARCHITECT'S / LANDSCAPE ARCHITECT'S DESIGN DRAWINGS FOR DETAILS OF PROPOSED SURFACE FINISHES AND LANDSCAPING
- REFER TO ARCHITECT'S DRAWINGS FOR DETAILS OF DRAINAGE
- ALL SURFACE WATER DRAINAGE IS TO BE INSTALLED IN ACCORDANCE WITH THE GREATER DUBLIN REGION CODE OF PRACTICE FOR DRAINAGE WORKS, THE BUILDING REGULATIONS PART H AND THE SITE DEVELOPMENT SPECIFICATION
- ALL CAN PAVEMENT DRAINAGE IS TO BE INSTALLED IN ACCORDANCE WITH THE GREATER DUBLIN REGION CODE OF PRACTICE FOR DRAINAGE WORKS, THE BUILDING REGULATIONS PART H AND THE SITE DEVELOPMENT SPECIFICATION
- ALL WASTEWATER DRAINAGE IS TO BE INSTALLED IN ACCORDANCE WITH THE RISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE (REVISION 2 - JULY 2020), THE BUILDING REGULATIONS PART H AND THE SITE DEVELOPMENT SPECIFICATION
- ALL DRAINAGE COVER LEVELS ARE TO BE COORDINATED WITH PROPOSED ROAD DESIGN LEVELS AND ARCHITECT/LANDSCAPE ARCHITECT'S PROPOSED FINISH LEVELS
- ALL BASEMENT CHAMBERS COVERS TO BE DOUBLE SEATED, AND CLASSIFICATION D400 LOADING WHERE LOCATED IN VEHICULAR AREAS
- ALL CONNECTIONS TO NEW DRAINAGE NETWORKS ARE TO BE MADE AT AN ANGLE OF 90° OR IN THE DIRECTION OF FLOW
- REFER TO ARCHITECT AND SUE ENGINEERING DESIGN DRAWINGS FOR CONFINEMENT OF LOCATION AND SPECIFICATION OF FLOOR GULLIES
- REFER TO M&E ENGINEERING DESIGN FOR CONFINEMENT OF WASTE AND SANITARY POP-UP/OUTLET LOCATIONS
- THE CONTRACTOR IS TO VERIFY INVERT LEVEL AT PROPOSED CONNECTION TO EXISTING SEWERS PRIOR TO ANY WORKS BEING CARRIED OUT, AND MAKE ANY DISCREPANCIES KNOWN TO THE ENGINEER
- THE CONTRACTOR IS RESPONSIBLE FOR CONFINEMENT OF PRESENCE ALL EXISTING UTILITIES, IF ANY, ALONG ROUTE OF PROPOSED DRAINAGE NETWORKS - BY INTRUSIVE INVESTIGATION OR OTHERWISE
- EXISTING PUBLIC SEWER TO BE JET CLEANED AND CCTV SURVEYED PRIOR TO, AND AFTER PROPOSED CONNECTIONS FROM NEW NETWORK
- ALL NEW DRAINAGE INFRASTRUCTURE IS TO BE JET CLEANED AND CCTV SURVEYED, ANY NOTED DEFECTS REMEDIATED, ON COMPLETION OF WORKS TO THE SATISFACTION OF THE LOCAL AUTHORITY

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CONSULTING ENGINEERS

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BS EN 12056-3
2012

SKY CASTLE LTD
Primary Care Centre & Nursing Home

File: PROPOSED DRAINAGE NETWORKS LAYOUT MASTERPLAN

Code	Originator	Zone	Level	Type	Role	Number	Status	Revision
5655	OCSC	1R	MH	DR	C	05001	SA	P05



APPENDIX 4-3

**CONSTRUCTION AND
ENVIRONMENTAL
MANAGEMENT PLAN**





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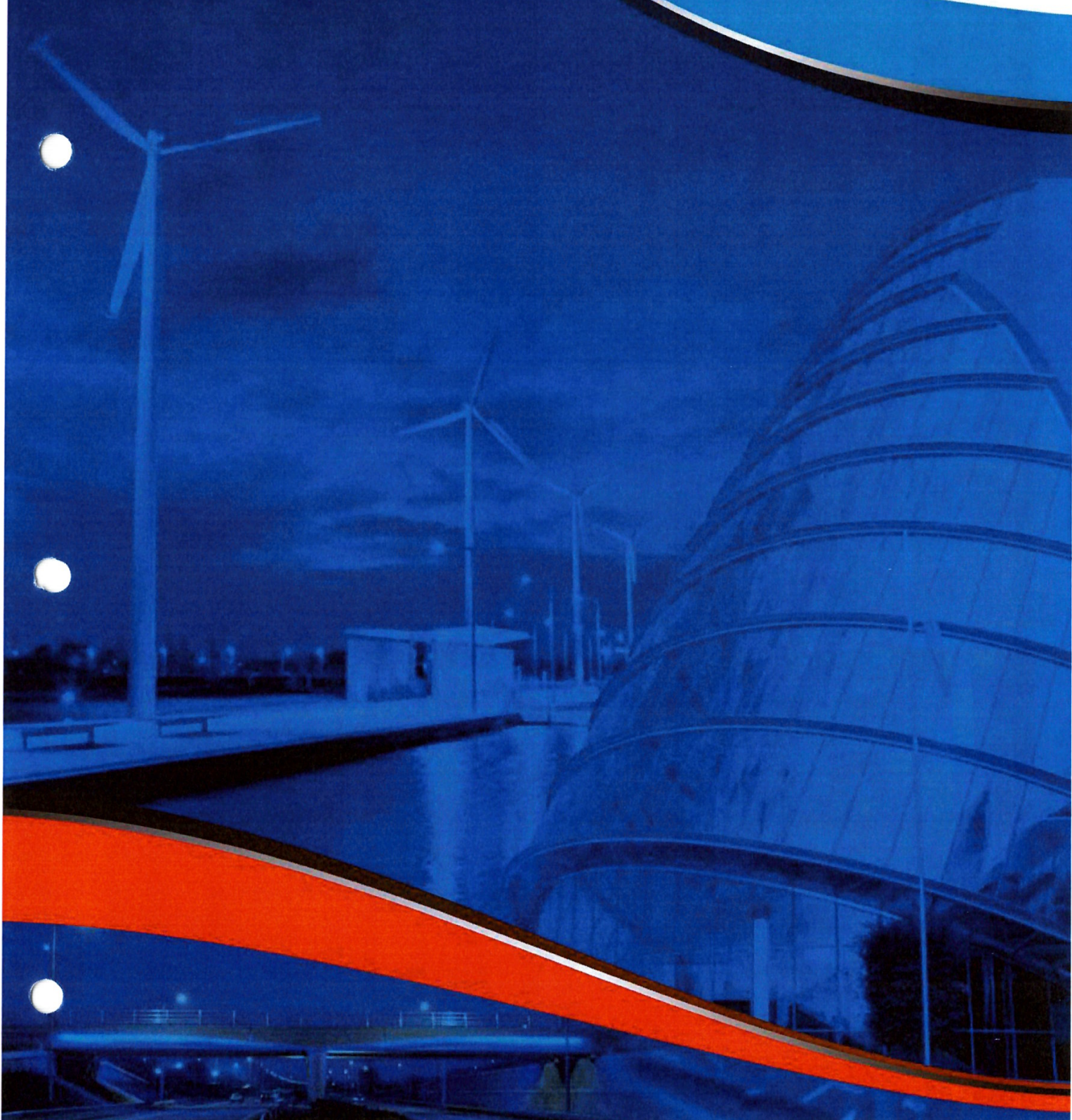
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CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME

Sky Castle Ltd
S665

24 August 2022



CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

Primary Care Centre & Nursing Home

Sky Castle Ltd
S665
24 August 2022

CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME



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Rev.	Status	Au thors	Checked	Authorised	Issue Date				
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P02	S4	WM	AH	AH	26.04.2022				
P01	S4	WM	AH	AH	31.03.2022				

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1 INTRODUCTION

APPOINTMENT

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by Sky Castle Ltd to carry out the design of the civil engineering services associated with the development of a proposed Primary Care Centre (PCC) and a Nursing Home Unit on lands at Moygaddy, Co. Meath, which is located northeast of the town of Maynooth, Co. Kildare.

SETTING

Maynooth environs is a large growth area, category II Town status located in south County Meath, and is an economically vibrant area with high-quality transport links to larger towns/cities. The Meath Development Plan 2021-2027 outlines the social, economic, and planning context for the Maynooth environ lands, setting the framework for the plan's policies and objectives. It has a core strategic vision that seeks to ensure that future growth is based on principles of sustainable development that meet the needs of residents per National and Regional guidelines. The environs of Maynooth is a Core Economic Area included in the Gateway Core Economic Area located on the M4 corridor. The wider Maynooth Environs Lands proposed land-use zoning includes A2 – New Residential, E1 – Strategic Employment Zones, G1 – Community Infrastructure, D1 – Tourism and H1 – High Amenity.

The delivery of the Maynooth Outer Orbital Route (MOOR) is critical to facilitating residential, high-end employment, tourist, and leisure development in the Maynooth environ lands and fulfilling the transport infrastructure needs in proximity to Maynooth University and Maynooth town.

ADMINISTRATIVE JURISDICTION

The proposed development is located primarily in the jurisdiction of Meath County Council (MCC), and therefore the Maynooth Outer Orbital Route design and the associated civil engineering services were carried out with reference to the following:

- Meath County Development Plan 2021-2027;
- Maynooth Environs Local Area Plan 2014 (incorporated into adopted MCDP);
- Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019);

Even though Maynooth Environs is situated in the Meath County Council administrative area, the Maynooth Environs Local Area Plan contains an objective to liaise with Kildare County Council in the identification, design, reservation and delivery of the section of the Maynooth Outer Relief Road located within the administrative area of Meath County Council. The administrative area of Kildare County Council is located immediately adjacent to the LAP environs lands and some infrastructure improvements will be located within the Kildare County Council (KCC) administrative area. Therefore, the design will also be conducted with due regard to:

- Maynooth LAP
- Kildare County Development Plan
- Maynooth Traffic Management Plan

STUDY AREA

The subject site is located on the southernmost extent of County Meath, as shown in Figure 1, aligning with the county boundary to Co. Kildare. It is approximately 1.5km north of the town of Maynooth, Co. Kildare, which forms part of a larger strategic landbank on zoned lands known as Maynooth Environs. The site is immediately bound by:

- R157 Maynooth – Dunboyne Road, to the east;

- Agricultural lands, to the north and west; and
- River Rye Water, to the south;

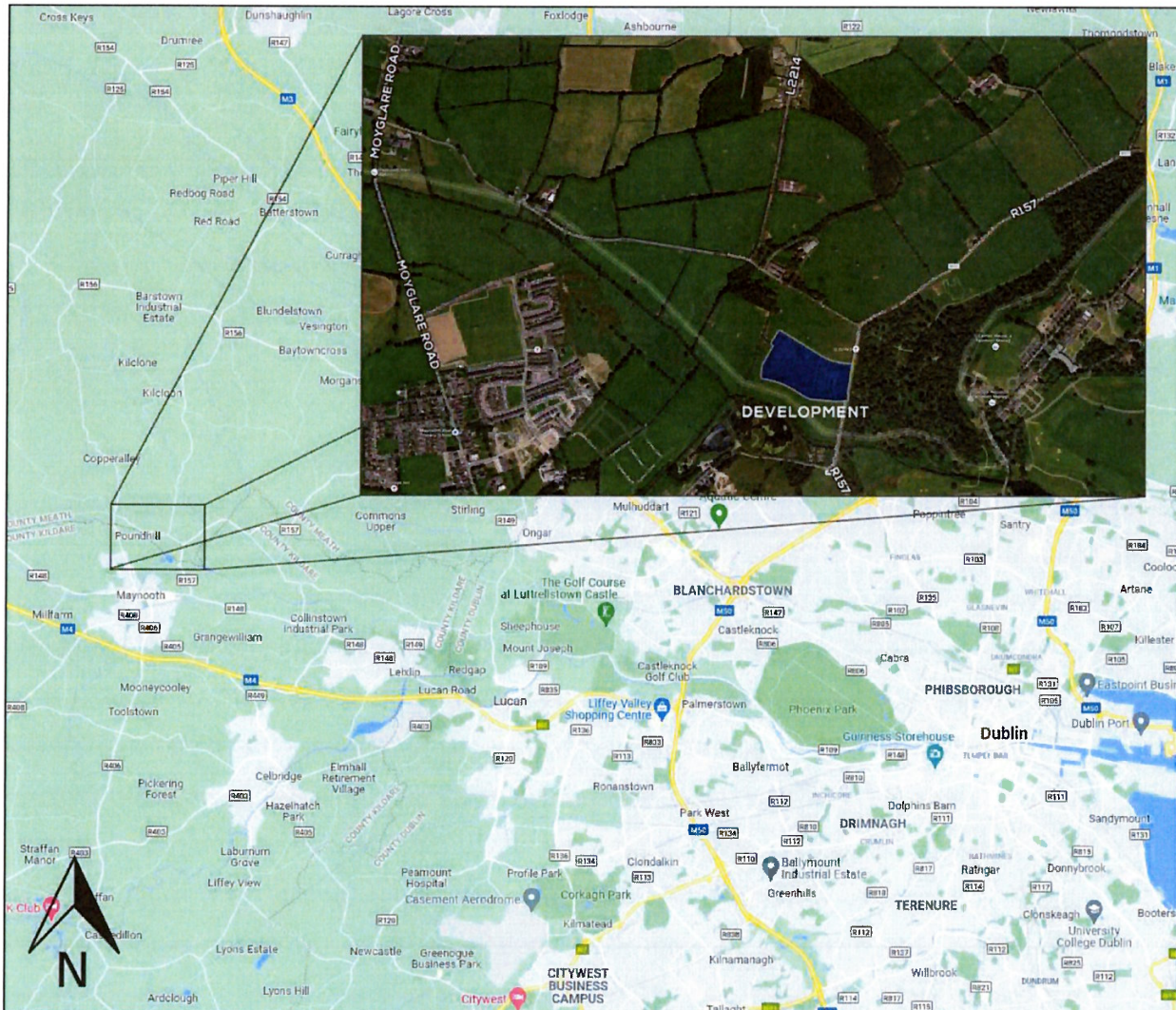


Figure 1: Development Locality Plan

DEVELOPMENT DESCRIPTION

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.

The proposed development comprises:

1. Construction of a new two-storey Nursing Home of 156 no. bedrooms with a Gross Floor Area (GFA) of 8,576m², including vehicular drop-off area and service road.
2. Construction of a new three-storey Primary Care Centre (PCC) with a Gross Floor Area (GFA) of 3,049m², including vehicular drop-off area.
3. The development includes a shared surface car park providing 161 no. car parking spaces (comprising of 151 no. standard car parking spaces and 10 no. accessible car parking spaces) and approximately 160 no. bicycle parking spaces.
4. Provision of foul and surface water drainage including an underground wastewater pumping station.
5. Connection to potable water supply at Kildare Bridge.
6. Provision of communal (semi-private) and public open space.
7. Provision of hard and soft landscaping including amenity equipment, fencing and gates.
8. Provision of substation and public lighting.
9. Proposed road improvement and realignment works along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556), including:
 - (i) Construction of a new 2-way, 6m-wide access road from the R157 Dunboyne Road to include a priority T-junction on the R157 which includes a right-turn lane from the R157 into the access road,
 - (ii) Upgrade works to a section of the R157 from the new site entrance south to Kildare Bridge on the R157 (representing delivery of a 15m-wide portion of the Maynooth Outer Relief Road (MOOR)), including creation of a new 2m-wide footpath, 3m-wide cycle lane and pedestrian and cycle link adjacent to Kildare Bridge,
 - (iii) Provision of pedestrian and cycle improvement measures.
10. All other site development works and services ancillary to the proposed development.
11. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the planning application.

This document serves to inform the planning process in respect of the proposed development. It is intended that this Construction and Environmental Management Plan (CEMP) will be an interim assessment and it is not intended to be a final version to cover the eventual construction of any permitted development. A detailed Construction Management Plan will be prepared by the appointed contractor for the works. This document will be updated continuously to take account of any necessary changes on the foot of the recommendations of the EIAR, the planning process and throughout any phased construction period.

The CEMP to be prepared by the appointed contractor, and agreed upon with the Local Authority before the commencement of any construction works, will ultimately include details on the following:

- Daily and weekly working hours;
- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads;
- Construction traffic routing;
- Temporary footpaths & road closures (if required);
- Fuel & oil storage;
- Noise vibration & dust monitoring and management;
- Construction waste management & disposal;
- Surface water run off management.

2 CHARACTERISTICS OF THE DEVELOPMENT

DEVELOPMENT & SITE OVERVIEW

The overall gross site area is **c.8-hectares** and is zoned by Meath County Council for ***Community Infrastructure*** in the Meath County Development Plan 2021 - 2027.

The site is currently greenfield and used for agricultural purposes and can be accessed from the R157, Maynooth to Dunboyne Road, which aligns with the eastern boundary of the subject site. Ground levels across the site typically fall gently from north to south, with a sharp decline at the southern and eastern boundaries, which align with the River Rye Water and Moyglare Stream respectively.

The proposed development at Moygaddy consists of the construction of a Primary Care Centre (PCC) and Nursing Home Unit; with access provided from the R157, which aligns with the eastern boundary of the proposed site. The proposed works also include the upgrading of a section of the R157 from Kildare Bridge, south of the proposed site, to the proposed development entrance. Additional to this, will be the creation of new internal access roads and car parking.

A separate application will be made to the Kildare County Council for the upgrade of the R157 south of the Kildare Bridge. This overlap of applications will ensure unimpeded access to the proposed development lands for all modes of transport including vehicular and dedicated pedestrian and cyclists facilities.

The proposed site layout is shown in Figure 2 overleaf.

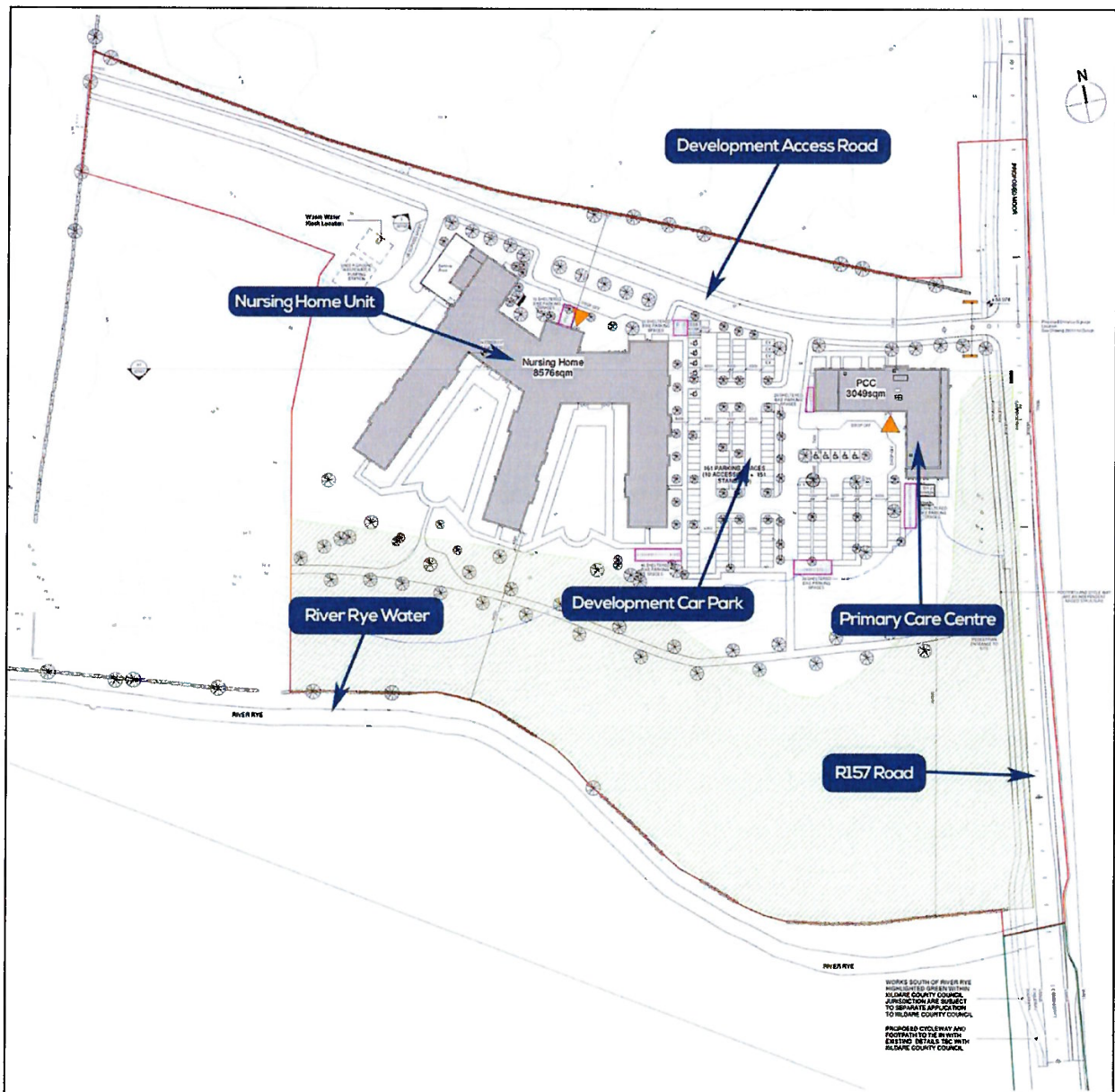


Figure 2: Proposed Development Layout

3 CONSTRUCTION PROGRAMME & PHASING

PHASING

Given the limited size and scale of the proposed development it is expected that it will be developed in two individual, but sequential phases:

- Phase 1: Primary Care Centre
- Phase 2: Nursing Home

Subject to tender, individual contractors may be appointed to construct each phase as one development.

PROGRAMME

At present, the planned construction programme for the development is a commencement date of September 2023, with a target completion date of December 2025. This means that the planned construction duration is 27 months.

The phasing will be scheduled as follows:

- Phase 1: Primary Care Centre – month 0 to month 14
- Phase 2: Nursing Home – month 12 – month 27

This means that there will be a 2-month overlap between the two phases.

APPLICANT & DESIGN TEAM

The following are the main design team members in the project:

Role	Name	Contact
Applicant	Sky Castle Ltd	Ronan Barrett
Architect	Crawford Architecture	John Crawford
Consulting Engineer	OCSC	Anthony Horan
Landscape Architect	RMDA Ltd	Ronan Mac Diarmada
Planning Consultant	MKO	Pamela Harty
Main Contractor	TBC – Subject to Tender	TBC

Table 1: Project Participants

4 SITE ESTABLISHMENT

SITE ACCESS & OPERATIONS

Site access will be provided on the R157 via the regional road network. Construction will be done through offsite and onsite construction that may require the use of mobile cranes. The crane locations (if required) will be established at a later date in consultation with the main contractor.

The location for the site compound, construction hauling route and construction site access are shown in the figure below. It should be noted that these are only indicative and will be finalised prior to construction.

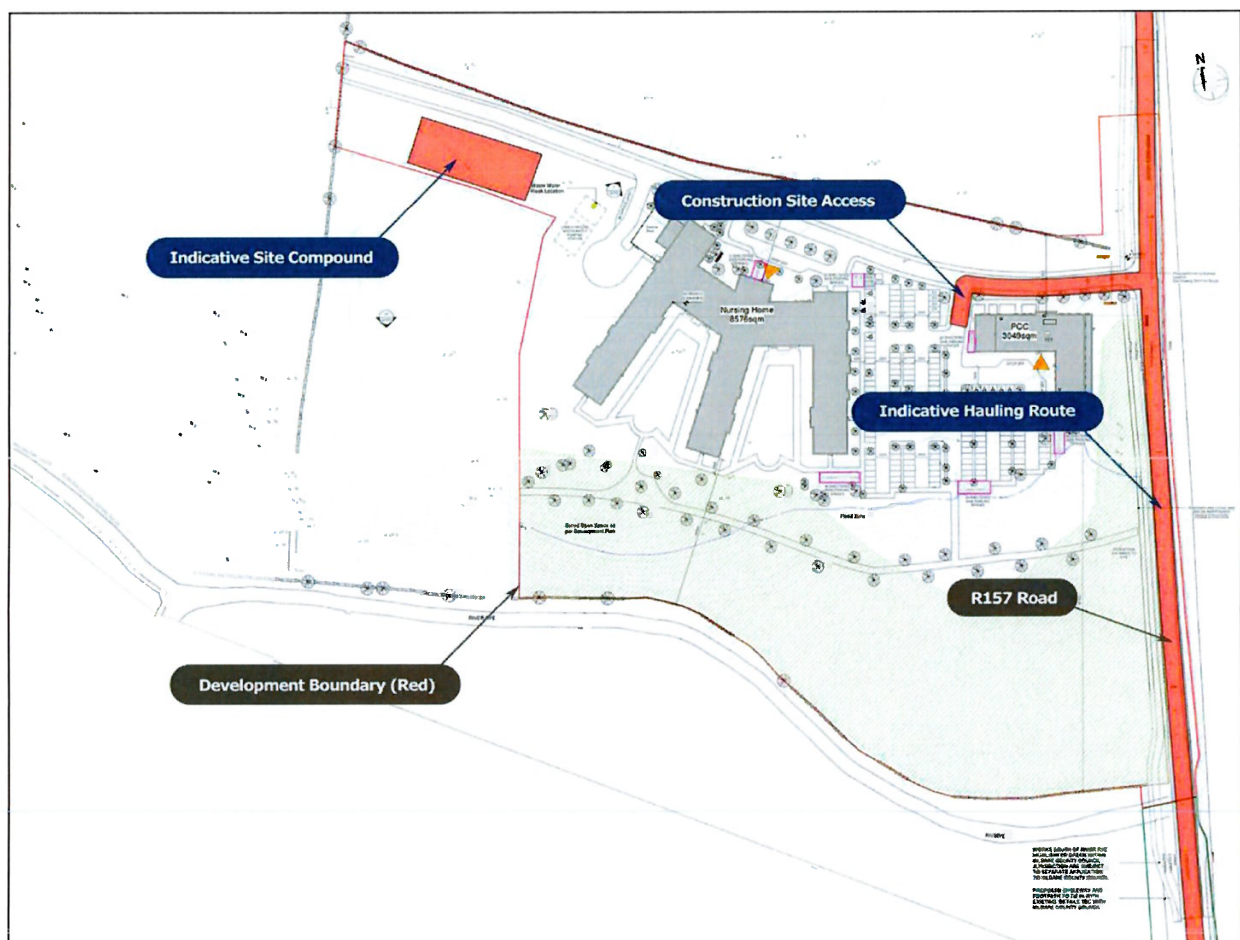


Figure 3: Indicative Site Compound and Hauling Route

HOARDING

Perimeter hoarding will be provided around the different phases of the site and along the public road to prevent unauthorised access to the site. Controlled access points will also be provided. Hoarding will be maintained to a high standard and painted or covered as appropriate. Temporary hoarding will be provided as necessary within the site as safety restrictions to prevent public access. The locations of this temporary hoarding will vary as work progresses across the site.

TREE PROTECTION

Appropriate measures will be put in place to protect any trees on the site which are designated for protection or retention under any granted planning permission for the development. For more information and detailed measures, please refer to the EIAR and Arborist/Tree Protection reports submitted under separate cover.

ARCHAEOLOGY

Appropriate arrangements will be made with a licensed archaeologist to monitor soil stripping and other development works as may be conditioned in any planning permission for the proposed development. The environmental mitigation measures are described in detail in Chapter 15: Schedule of Mitigation and Chapter 12 Cultural Heritage within the EIAR.

ENABLING WORKS & WORKS ON THE PUBLIC ROAD

Works on the public road will be carried out subject to, and under, a Road Opening Licence from the Local Authority. All works on the public road will be carried out per the Local Authority and HSA guidelines for working on public roads, with traffic management under Chapter 8 of the TSM and the appropriate traffic management guidelines.

INSTREAM WORKS

The sustainable drainage network requires the construction of filler drains along the entire site boundary and the contribution of an outfall to the River Ryewater, which consists of the construction of a new concrete headwall at the edge of the river.

As both headwalls and the bridge are to be constructed in proximity to watercourses, OCSC has considered their construction methodology in detail.

HEADWALLS

All headwalls required for the construction of this scheme are small in nature and will be precast. As such, the site work will be minimal. The contractor will set out the position of the headwall and prepare the base with lean mix concrete or CI 808 crushed stone (product dependant). Once the base is prepared the headwall will be placed on the base in the pipeline and will be constructed from the back of the headwall.

BRIDGES

The bridge to be constructed as part of the scheme has the following key characteristics:

- Piled foundations;
- Cast in situ abutments;
- Precast deck elements;
- On deck cast in situ slabs or screeds;
- Post-fix parapets.

In advance of the construction of the bridge, a bridge-specific Risk Assessment and Method Statement (RAMS) shall be produced by the Contractor. This RAMS will be reviewed by the Project Supervisor Construction Stage (PSCS) to ensure that the works are taking place in a safe manner. This RAMS will also be reviewed by the designer to ensure that the construction methodology is compatible with the individual design. As this structure is over water, approval for the RAMS will also be required from the project

ecologist and Inland Fisheries Ireland. The RAMS will also require a review by the relevant local authority for the structure to be built adjacent to the existing and proposed public road.

Although it is acknowledged that there are many ways to construct a structure like this, which meet the requirements of all the aforementioned bodies, the below construction sequence is envisaged at this juncture to be likely adopted for construction:

1. Clear the works area and install silt traps and drainage controls under archaeological and ecological supervision as required;
2. Prepare the area with a geotextile and piling mat of approximately 300 to 600mm of 6F material;
3. Install bored piles for the foundations by way of a mobile CFA piling rig;
4. Mobilise the in situ reinforced concrete team of steel fixers and carpenters under engineering supervision to build the abutments and central piers (where required);
5. Place the main deck structure in accordance with a bespoke lifting plan prepared by a competent person;
6. Install falsework and permanent shutters;
7. Fix and pour the bridge deck;
8. Erect parapets and complete the bridge construction.

The bridge will be constructed both over and adjacent to the live water courses as shown in the figure overleaf.

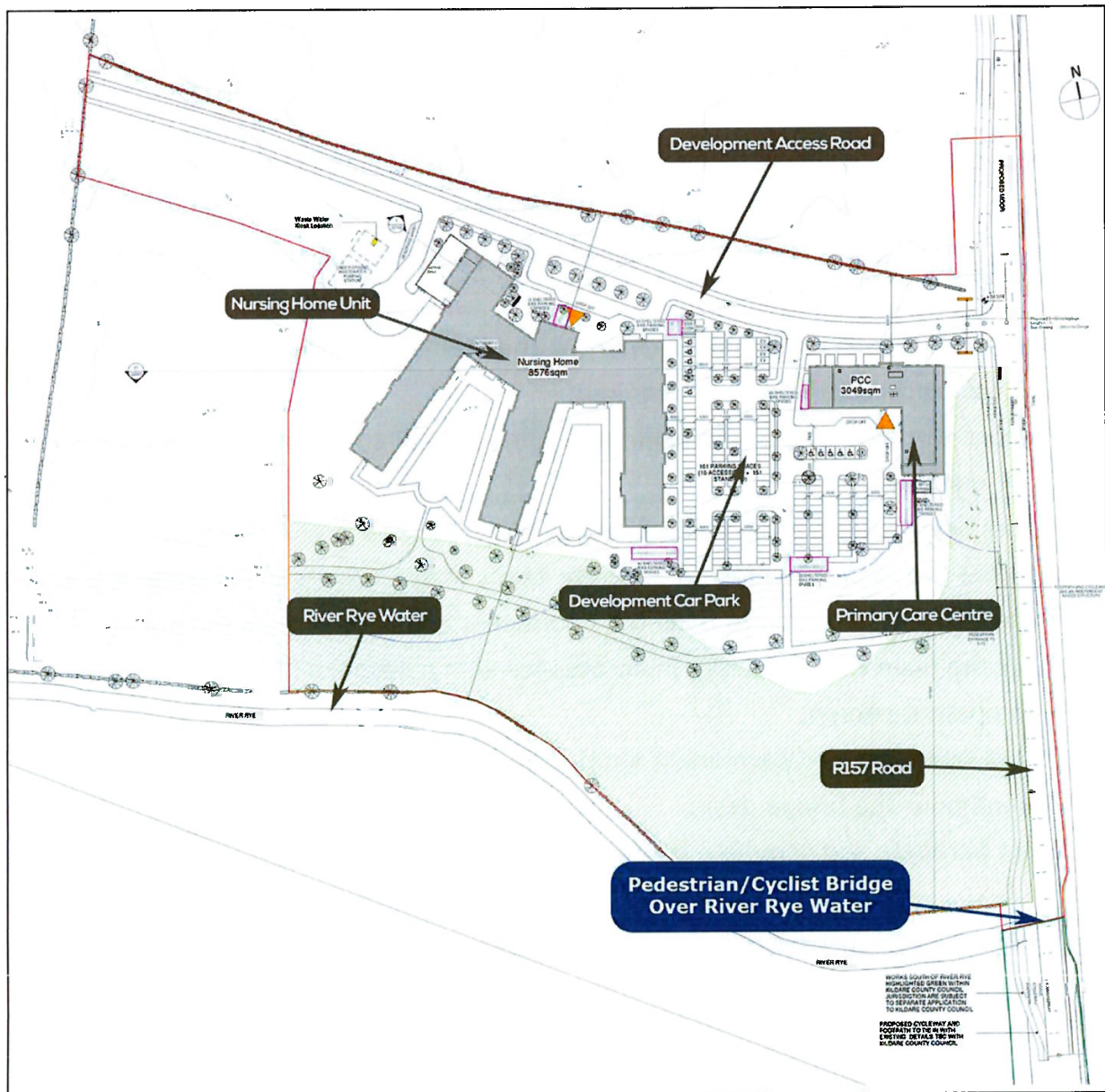


Figure 4: Location of Bridge in Development

This bridge is designed to be constructible without carrying out works in the wetted area of the water courses. The structure in proximity to water and over water will be planned and built in line with a detailed Risk Assessment and Method Statement that takes into account the requirement of Inland Fisheries Ireland and the mitigation measures as outlined in the EIAR. The structure has been preliminarily designed based on the ground

conditions present local to the individual structure and are to be detail designed to the approval of Meath County Council in line with Transport Infrastructure Ireland's design criteria for such structures. The construction of the bridge will be subject to appropriate oversight and supervision as is normal for similar public works.

Any plant and machinery being used should mitigate against oil spillage by sitting on a drip tray, with bunded surround, or similar approved. Silt traps and protection nets, or similar methods to prevent silt, debris, and other material, from falling into the river during construction activity should be employed. For more information, please refer to the EIAR submitted under separate cover.

All works in or near watercourses will be carried out in line with the Guidelines on the protection of fisheries during construction works in and adjacent waters" as published by Inland Fisheries Ireland in 2016 or as updated prior to construction works.

5 ESTIMATED CUT & FILL

Topsoil and subsoil/stones will be excavated to accommodate roads, footpaths, services, and construction. It is noted that for all areas of new construction (excluding green areas such as public open spaces and gardens) that the existing topsoil needs to be removed. As is good sustainable practice the topsoil excavated on the site will all be utilised on the site and added to the existing topsoil in areas such as gardens and open spaces. This will improve the depth of the growing medium in these areas and remove any requirement to transport topsoil from the site. The geotechnical investigations of the site suggest that there is generally 100mm of topsoil in the area for construction with some areas of 200mm of topsoil uncovered in the study area. As a conservative estimate of this, OCSC has assumed that the average depth of topsoil to be excavated is 150mm. This equates to a volume of topsoil to be excavated of approximately 2,900 m³. This volume of soil can be easily accommodated in the areas of gardens and open spaces (excluding areas close to the river and stream), therefore there will not be a requirement to remove topsoil from the site. Based on a 3d ground model of the existing site the expected volume of materials has been calculated. Given that the entire site is approximately 8.00 hectares, the following calculations have been made (see Table 2 over):

- Cut & Fill is taken from Site Strip Level to Formation Level. Topsoil is excluded from the calculation.
- 450mm Road Build Ups
- 450mm Building Pad Build Ups
- An allowance has been made for some soil not being acceptable for reuse on the site.

Item	Cut Volume (m ³)		Fill Volume (m ³)
Fill 2.5m – 3m	-	-	-
Fill 2m – 2.5m	-	-	10
Fill 1.5m – 2m	-	-	100
Fill 1m – 1.5m	-	-	350
Fill 0.5m – 1m	-	-	1200
Fill 0m – 0.5m	-	-	4900
Cut 0m – 0.5m	7900	-	-
Cut 0.5m – 1m	2750	-	-
Cut 1m – 1.5m	450	-	-
Cut 1.5m – 2m	50	-	-
Total Cut	Cut	Reuse	Export
	11 150 m ³	6 560 m ³	4 590 m ³
Total Fill	Fill	Reuse	Import
	6 560 m ³	6 560 m ³	0 m ³
Total Haulage	c. 10 600 Tonnes		

Table 2: Development Cut & Fill Calculations

The cited figures in the table above are overall cumulative cut and fill volumes and relate to all proposed works at the site. It should be noted that these numbers are approximated and will be subject to change depending on construction methodologies and ambient weather conditions at the time of the works. It was assumed that the density of excavated material is approximately 2.3 tons/m³.

6 CONSTRUCTION TRAFFIC

SITE ACCESS & TRAFFIC ROUTING

As mentioned previously, the site will be accessed via the R157.

Regarding traffic routing, traffic management routes will utilise the Regional & National Road network and waste will be disposed of by licensed hauliers in appropriately licensed facilities only. All final traffic management routes will be agreed upon by the contractor with the relevant Local Authority in advance of the commencement of construction.

The exact location of batching plants and disposal sites will be established once a contractor has been appointed.

CONSTRUCTION TRAFFIC VOLUMES

It is difficult to assess the exact quantum of traffic that will be generated during the construction period. However, to estimate the volume and rate of construction traffic, it is first necessary to estimate the amount of excavation and earthworks required on the site, which is shown in the previous section.

Based on this, and from the experience of similar construction projects, it is considered that there will be a maximum of twelve HGVs serving the site during any given daytime hour. This is based upon the knowledge that it takes on average 10 minutes to load a lorry with spoil but could be as short as 5 minutes. As such, the two-way HGV traffic is unlikely to be higher than 24 vehicles per hour at any point of the day. Based on an 8-hour day and a 22 working day month, 24 vehicles per hour equates to 4,224 vehicles per month.

It is worth noting however that the 10 600 tonnes of combined recycling & disposal equate to just over 530 truckloads based on 20 tonnes per load. It should be further

noted that two developments are earmarked for construction during a similar timeframe as this development, within the same area. It could be possible that excess cut volumes from these sites can be used for the shortfall of fill volume for the other sites, reducing the amount of material that needs to be exported.

Measures will be put in place to minimise the amount of construction traffic generated by the development. These measures will include the reuse of materials within the site for landscape purposes, or within adjacent sites for fill, to limit the amount of spoilage.

It will be an objective of this development to reuse as much material as possible and minimise the amount of material to be transported off-site. Furthermore, the possibility will be investigated of using excess cut material in other developments which form part of the wider masterplan, implemented within the same timeframe of this development. This will minimise the amount of material to be transported off-site, which will reduce the environmental impacts and cost to the development.

The contractor will maximise the use of precast materials or prefabricated materials wherever possible and economically viable. Adequate storage space will be provided on site for the storage of materials and a site strategy will be put in place to manage the timing of deliveries to the site. Trips by construction workers will be limited by the provision of car-sharing and Travel to Work Scheme benefits. Construction workers will be encouraged to use public transport to the maximum possible extent. Adequate storage space will be provided on site for the storage of materials and a site strategy will be put in place to manage the timing of deliveries to the site.

It is not anticipated that the amount of construction traffic will exceed the amount of operational traffic.

SITE PARKING

A limited number of on-site parking will be provided for construction workers and site visitors.

STAFF WELFARE

Appropriate welfare facilities will be provided on site for construction staff and will include, inter alia:

- Canteen facilities;
- Toilet Facilities;
- Office accommodation;
- Drying areas/changing areas;
- Tool storage areas.

CONSTRUCTION TRAFFIC MITIGATION MEASURES

The appointed contractor will put in place measures to keep public roads free of detritus and debris. This will include undertaking regular road sweeping by a mechanical sweeper and the provision of wheel wash facilities on the site.

7 SITE WASTE MANAGEMENT PLAN

Waste materials generated will be segregated on site. This will allow for the maximum possible degree of recycling. Where on-site segregation of certain waste types is not practical, off-site segregation will be carried out. Skips and receptacles will be provided to facilitate segregation at the source.

All waste receptacles leaving the site will be covered or enclosed. The on-site waste storage area will be secured within the overall site which will be hoarded off from the public and unauthorised access.

The appointed waste contractor will collect and transfer the waste as receptacles are filled. Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction phase, the classification of each waste type, the contact details and the waste collection permit number of all waste contractors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed of off-site.

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

The management of the main waste streams is detailed in the figure overleaf:



Figure 5: Proposed C&D Waste Storage Area (Scale: NTS)

WASTE MANAGEMENT CATEGORIES

SOIL/SUBSOIL

Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2011, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

If any of the excavated spoil is found to be clean/inert, the site manager will investigate whether nearby construction sites may require clean fill material, to both minimise the costs of transport and to reuse as much material as possible. Any soil/subsoil deemed to be contaminated will be stored separately from the clean and inert soil/subsoil. The material will be appropriately classified as non-hazardous or hazardous under the www.hazwasteonline.com application and EC Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills, before being transported to an appropriately permitted/licensed facility by permitted contractors.

CONCRETE, BRICKS, TILES & CERAMICS

The majority of concrete, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

HARD PLASTIC

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

TIMBER

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be segregated and stored in skips.

METAL

Metals will be segregated into mixed ferrous, cladding, aluminium, high-grade stainless steel, low-grade stainless steel etc. categories, where practical. Metal is highly recyclable and numerous companies will accept these materials. Metals will be segregated and stored in skips.

PLASTERBOARD

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

GLASS

Glass materials will be segregated for recycling, where possible.

ORGANIC (FOOD) WASTE

An on-site canteen will be provided to allow workers to prepare and eat food. This facility will incorporate provisions so that organic waste will be segregated for separate collection. Segregation at source and separate collection of organic waste is required under the Waste Management (Food Waste) Regulations 2009 (if food is prepared on-site).

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

WEEE that does not contain hazardous components will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling. There are not expected to be any significant amounts of such materials as there are no existing buildings on the subject site.

NON-RECYCLABLE WASTE

C&D waste which is not suitable for reuse or recovery will be placed in separate skips or other receptacles. This will include polystyrene, some cardboard and plastic which are deemed unsuitable for recycling.

Before removal from the site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team to determine if recyclable materials have been misplaced. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

HAZARDOUS WASTES

On-site storage of any hazardous wastes produced (i.e. contaminated soil and/or waste fuels) will be kept to a minimum, with removal off-site organised regularly. Storage of all hazardous wastes on site will be undertaken to minimise exposure to on-site personnel and the public and to also minimise the potential for environmental impacts.

MANAGEMENT & CONTROL SYSTEMS

It will be the role of an appointed Waste Manager to try to find alternative options for waste before sending it to the landfill. Waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the Waste Management (Collection Permit) Regulations 2007 as amended. The contractor will provide the Waste Manager on site with documentation of the waste to be removed and a copy of the waste collection permit. Before the waste leaves the site, the Waste Manager will have documentation to show where the waste is being taken to, and that the facility is licensed to accept the particular waste. A receipt will be issued for each load that leaves the site.

All waste will be documented before leaving the site. Waste will be weighed by the contractor, either by a weighting mechanism on the truck or at the receiving facility.

These waste records will be maintained on-site by the Contractor. All movement of waste and the use of waste contractors will be undertaken under the Waste Management Acts 1996 - 2008, Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager will maintain a copy of all waste collection permits.

Some wastes may be transported to another site for reuse on that site. The Waste Manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc. All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off-site will be covered to prevent dust or particle emissions from the load.

If the waste is being transported to another site, a copy of the Local Authority waste permit or EPA Waste Licence for that site will be provided to the nominated project Waste Manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

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

8 ENVIRONMENTAL MANAGEMENT

A full suite of Environmental Mitigation Measures are described in detail in Chapter 15: Schedule of Mitigation of the EIAR. The CEMP will be updated in accordance with the planning permission and any mitigation contained within the permission.

POLLUTION PREVENTION

Pollution prevention measures will be undertaken per best practice guidelines from Inland Fisheries Ireland (2016). There are no sensitive fisheries habitats on the site, however drainage ditches lead to the River Rye. A programme for the control of sediment will therefore be required. This will be put in place by the appointed contractor.

Only sediment-free run-off is to leave the site. A suitably sized detention basin or settlement area will be installed at the lowest point before discharge where excess run-off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.

The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.

The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area. The site compound will display emergency contact details for Inland Fisheries Ireland, the National Parks and Wildlife Service, the Local Council, and the Environmental Protection Agency in the event of a pollution incident or environmental emergency. Adequate spill kits will be available in the event of a spill of oil or other hazardous substance.

TRAINING

All site personnel will be trained in the importance of good environmental practices including reporting to the Site Manager when pollution, or the potential for pollution, is suspected.

PROTECTION OF TREES

As noted previously, appropriate measures will be put in place to protect any trees on the site which are designated for protection or retention under any granted planning permission for the development. For more information and detailed measures, please refer to the EIAR and Arborist/Tree Protection reports submitted under separate cover.

NOISE CONTROL

Measures will be implemented to minimise the impact of noise emissions at sensitive locations during the construction phase. Such measures will include the following:

- Construction contractors will be required to comply with the requirements of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations and the Safety, Health and Welfare at Work (Control of Noise at Work) Regulations;
- All plant items used during the construction phase should comply with standards outlined in the 'Safety, Health and Welfare at Work (Control of Noise at Work) Regulations and the 'European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations'. Reference will be made to BS 5228: Part 1: 2009 (Noise Control on Construction and Open Sites - Part 1. Code of Practice for Basic Information and Procedures for Noise Control) and will include the following mitigation measures:
 - Training of site staff in the proper use and maintenance of tools and equipment;
 - The positioning of machinery on-site to reduce the emission of noise and to site personnel;

- Sources of significant noise will be enclosed where practicable;
 - Machines that could be in intermittent use will be shut down between work periods or will be throttled down to a minimum;
 - A plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise-sensitive areas; and
 - Plant and/or methods of work causing significant levels of vibration at sensitive premises will be replaced by other less intrusive plants and/or methods of working where practicable.
- The inherently quiet plant will be selected where appropriate;
 - Screening and enclosures will be utilised in areas where construction works are continuing in one area for a long period or around items such as generators or high-duty compressors. For maximum effectiveness, a screen will be positioned as close as possible to either the noise source or the receiver. The screen will be constructed of material with a mass of $>7\text{kg/m}^2$ and should have no gaps or joints in the barrier material. This can be used to limit noise impact to any noise-sensitive receptors;
 - Operators of all mobile equipment will be instructed to avoid unnecessary revving of machinery and mobile equipment will be throttled down or switched off when not in use;
 - Accordingly, where possible all construction traffic to be used on-site will have effective well-maintained silencers; and
 - All mobile plants will be maintained to a high standard to reduce any tonal or impulsive sounds.

For more information on noise control, including indicative locations for noise monitoring, please refer to the EIAR submitted under separate cover.

VIBRATION CONTROL

Any construction works that have the potential to cause vibration at sensitive receptors will be carried out per the limit values in Table 3 hereunder, at the most affected sensitive receptor.

Allowable PPV (mm/s) at Sensitive Receptors at Given Frequencies (Hz)		
<10 Hz	10 – 15 Hz	50 Hz and above
8 mm/s	12.5 mm/s	20 mm/s

Table 3: Vibration Limits

DUST CONTROL

The main activities that may give rise to dust emissions during construction include the following:

- Materials handling and storage; and
- Movement of vehicles (particularly HGVs) and mobile plants.

The following mitigation measures will be implemented on-site during the construction phase, as required:

- Site roads shall be regularly cleaned and maintained as appropriate;
- Hard surface roads shall be swept to remove mud and aggregate materials from their surface as a result of the development works;
- Any un-surfaced roads shall be restricted to essential site traffic only;
- Any road that has the potential to give rise to fugitive dust may be regularly watered, as appropriate, during extended dry and/or windy conditions;
- On-site speed limits will be stipulated to prevent the unnecessary generation of fugitive dust emissions;
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to the wind;
- A complaints register will be maintained on-site and any complaints relating to dust emissions will be immediately dealt with;
- In periods of dry weather when dust emissions would be greatest, a road sweeper, which would also dampen the road, will be employed to prevent the generation of dust;
- Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods; and

- If appropriate, dust monitoring will be carried out during the construction phase of the scheme. If the level of dust is found to exceed $350\text{mg}/\text{m}^2\text{day}$ in the vicinity of the site, further mitigation measures will be incorporated into the construction of the proposed scheme.

For more information on dust control, including indicative locations for dust monitoring, please refer to the EIAR submitted under separate cover.

9 CONSTRUCTION PHASE MITIGATION MEASURES

GENERAL MITIGATION MEASURES

The following general environmental mitigation measures are proposed during the construction phase:

- Before the outset of these works, small defined works areas will be fenced off at the location of the storm water outfalls (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Rye Water River and the Blackhall Little River
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Rye Water River or the Blackhall Little River will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 31st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one-tonne sandbags at the edge of the Rye Water River and the Blackhall Little River at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdam area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).
- The banks and channel beds will be reinstated to avoid erosion or runoff of silt. Following this, the dams will be removed.
- The surface water discharge point is likely to take less than one day to install.

- Sondes will be put in place in the Rye Water River and the Blackhall Little River upstream and downstream of the works area. These will continuously measure turbidity throughout the construction period. If there is a 10% or greater difference between upstream and downstream turbidity, an alarm will sound and a message will be sent to the site foreman and the ECoW. Works will be ceased.

CEMENT-BASED MITIGATION MEASURES

To avoid the release of cement-based material during construction, the following measures are proposed:

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and pre-cast elements for culverts and concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on-site, only chute cleaning will be permitted, using the smallest volume of water possible. No discharge of cement-contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

SITE DRAINAGE/POLLUTION PREVENTION

Prior to the commencement of any construction activities, mitigation measures will be put in place to ensure the protection of surface water during the works. Surface waters will be managed, allowing water to percolate naturally to ground. Particular emphasis will also be placed on preventing any hazardous materials entering the surface water management system as well as spills or leaks of fuel oils.

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.

- A solid boundary fence will be constructed around the construction footprint in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint and the stream.
- No works will be undertaken outside the confines of this fence with the exception of the installation of the two surface water outfalls, which will be undertaken as a separate element of the development that is described below.
- A silt fence will also be attached to this boundary fence. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities. The silt fence will comprise a geotextile membrane that will be buried beneath the ground to filter any run-off that may occur as a result of the proposed works.
- The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- 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;
- 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;
- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses; and,

- Good construction practices such wheel washers and dust suppression on-site roads, and regular plant maintenance will ensure minimal risk.

CONSTRUCTION TRAFFIC ACCESS & MANAGEMENT

The following is a list of the proposed traffic management measures to be adopted during the construction works:

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access, and movement of construction vehicles will be restricted to these designated routes;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example, the use of dust covers on HGVs carrying dust-producing material;
- Speed limits of construction vehicles are to be managed by appropriate signage, to promote low vehicular speeds; No vehicle will be allowed to stop or park on the access road to the proposed development site.
- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development.
- On-site wheel washing will be undertaken for construction vehicles to remove any debris prior to leaving the site, and to remove any potential debris on the local roads if it is deemed necessary; All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will not be carried out on the public highway; and
- Minimal impact on the surrounding road network will be ensured.

10 HEALTH AND SAFETY

GENERAL HEALTH, SAFETY AND ENVIRONMENTAL CONSIDERATION

Construction works will be carried out in such a way as to limit, as far as practicable, adverse environmental impact. Works will be carried out under the following general provisions:

- Planning approvals from the Local Authority;
- Requirements of the Local Authority.

As part of any Construction Method Statement, the process will ensure that construction techniques and materials used are a fundamental consideration of the design and intended long-term use and that the aims below are achieved:

- Design for durability and low maintenance;
- Design for flexibility and adaptability;
- Use of materials from sustainable sources;
- Use of local materials where possible.

Safety, health, and environmental issues of the development are primary considerations in the construction methods adopted. The construction team will develop detailed health and safety plans, and specific environmental, fire and accident procedures to suit the construction sequence of the development.

Contractors involved in the development will ensure that all non-English speaking employees are provided with relevant Health and Safety information in their national language. All contractors will be required to adopt the relevant skills certification required for that element of the work. A site-specific Safety Statement and a detailed Construction Stage Safety & Health Plan will be compiled before any works on-site and will be per the Health & Safety Authority and Local Authority guidelines.

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH

The strategy for controlling all substances and all work processes that may generate hazardous substances will have to be addressed and control measures put in place. Some of the control measures to be employed include the following:

- All fuel and chemicals are to be stored in designated areas, with deliveries of hazardous materials, supervised.
- Storage tanks and container facilities will be appropriately bundled.
- In the case of spills or discharges, remedial action will be taken as soon as possible under company procedures.
- Personal protective equipment (PPE) suitable to the pertaining conditions will be used by all site personnel.

ENVIRONMENTAL, EMERGENCY AND ACCIDENT PROCEDURE

Measures will be carried out to avoid environmental incidents, however, if these occur then the following types must be reported to the responsible person in the construction team. The overall strategy in the event of a spillage will be to 'Stop-Contain-Notify' in the event of:

- Spills or discharges to the atmosphere, water supplies, sewage systems, rivers, and other watercourses, or the ground:
 - Any chemical products
 - Oils or fuels
 - Effluent/fumes and gases
 - Waste or contaminated materials
- Damage to existing:
 - Trees and wildlife
 - Flora and existing local habitats
- Any environmental incidents that could lead to:
 - Local Authority or regulatory enforcement

- Public complaint

Emergency routes and procedures will be continuously adapted to suit the construction sequence and stage of the Development. An *Emergency & Evacuation Plan* will be prepared following the guidelines detailed below and updated regularly during construction:

- Definition of the management organisation and responsibility for safety
- Definition of appropriate fire prevention measures, including good housekeeping of site, welfare facilities and offices.
- Adequate provision of fire extinguishers across the site.
- Use of non-flammable/fire retardant materials for protection of finished works.
- Safe use and safe storage of flammable materials of all categories, whether solid, liquid or gas.
- Appropriate waste management procedures.
- Monitoring the type and frequency of fire inspections/audits.
- Development of evacuation plans, including escape routes, muster stations, means of sounding alarms and general emergency procedures.
- Site safety inductions and fire drills.
- The application of permit systems for Hot works, Confined Space Entry and Electrical Access Control.
- The provision of first aiders. Checking of emergency routes is available and unobstructed at all times .
- Liaison with the emergency services and occupants of the adjacent buildings.

First aid facilities will be established and at least one trained first aider will be present on-site at all times. In addition, trained Fire Wardens / Fire Marshalls will be in place on-site to address fire safety.

11 HOURS OF WORKING

Construction operations will be carried out under any granted planning conditions. It is expected that normal working hours will be from 07:00 – 19:00 Monday to Friday and from 08:00 – 15:00 on Saturdays.

It may be necessary for some specific construction activities to take place outside of these times and in those cases, a specific derogation will be sought from the Local Planning Authority.

Deliveries to the site will be arranged to arrive within normal working hours as set out above.

There may, again, be specific deliveries which need to arrive outside of these hours e.g. in respect of wide loads. In all such cases, the applicant will again liaise and agree to any necessary derogations with the Local Planning Authority.

12 VERIFICATION

This report was compiled and verified by:

Wian Marais BE (US), BE (Hons) (UP), Professional Engineer (ECSA)

Civil Engineer

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APPENDIX 4-4

**CONSTRUCTION AND
DEMOLITION WASTE
MANAGEMENT PLAN**



OCSC

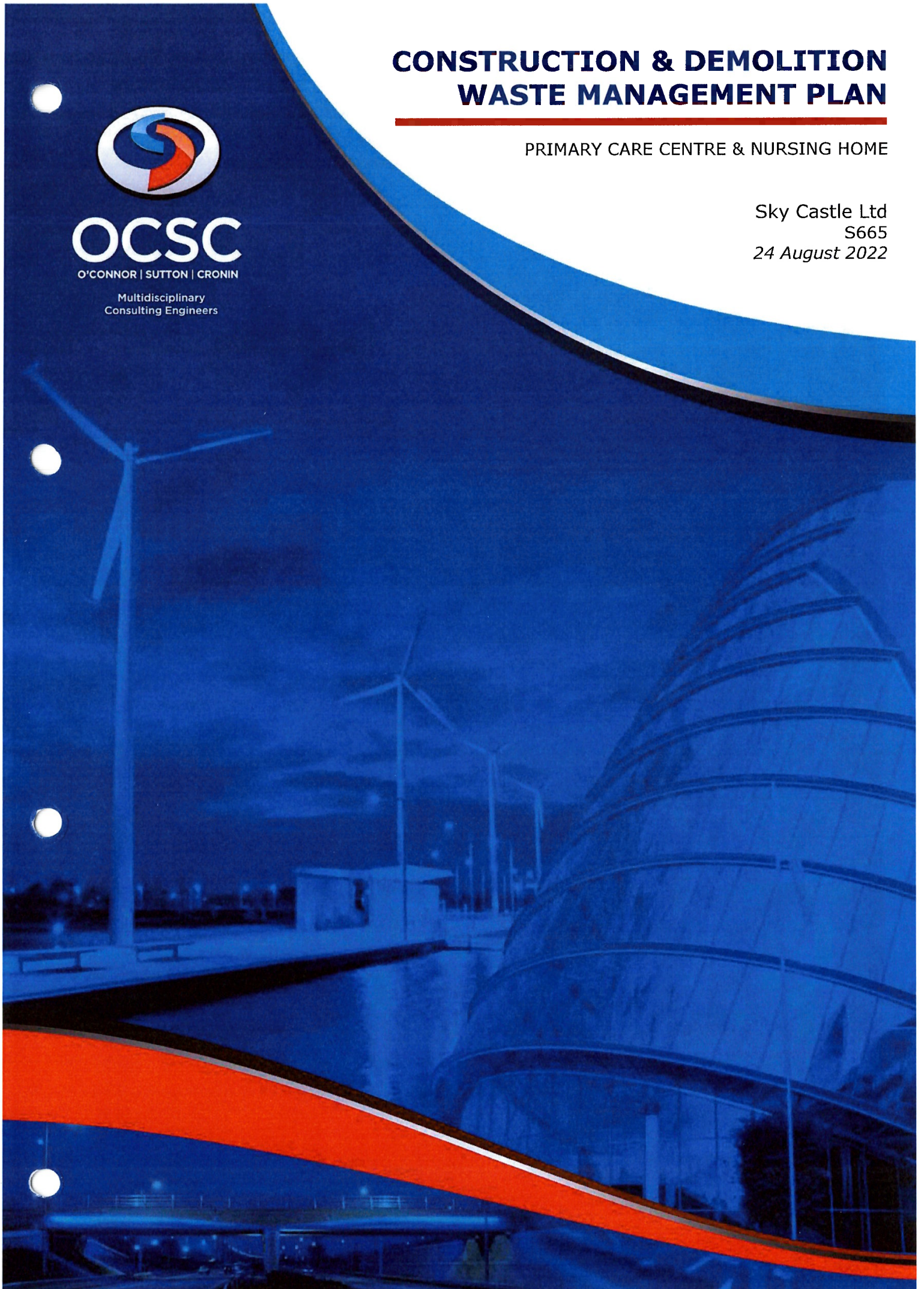
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CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME

Sky Castle Ltd
S665
24 August 2022



CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

Primary Care Centre & Nursing Home

Sky Castle Ltd

S665

24 August 2022

CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

PRIMARY CARE CENTRE & NURSING HOME



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DOCUMENT CONTROL & HISTORY

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1 INTRODUCTION

APPOINTMENT

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by Sky Castle Ltd to carry out the design of the civil engineering services associated with the development of a proposed Primary Care Centre (PCC) and a Nursing Home Unit on lands at Moygaddy, Co. Meath, which is located northeast of the town of Maynooth, Co. Kildare.

SETTING

Maynooth environs is a large growth area, category II Town status located in south County Meath, and is an economically vibrant area with high-quality transport links to larger towns/cities. The Meath Development Plan 2021-2027 outlines the social, economic, and planning context for the Maynooth environ lands, setting the framework for the plan's policies and objectives. It has a core strategic vision that seeks to ensure that future growth is based on principles of sustainable development that meet the needs of residents per National and Regional guidelines. The environs of Maynooth is a Core Economic Area included in the Gateway Core Economic Area located on the M4 corridor. The wider Maynooth Environs Lands proposed land-use zoning includes A2 – New Residential, E1 – Strategic Employment Zones, G1 – Community Infrastructure, D1 – Tourism and H1 – High Amenity.

The delivery of the Maynooth Outer Orbital Route (MOOR) is critical to facilitating residential, high-end employment, tourist, and leisure development in the Maynooth environ lands and fulfilling the transport infrastructure needs in proximity to Maynooth University and Maynooth town.

ADMINISTRATIVE JURISDICTION

The proposed development is located primarily in the jurisdiction of Meath County Council (MCC), and therefore the Maynooth Outer Orbital Route design and the associated civil engineering services were carried out with reference to the following:

- Meath County Development Plan 2021-2027;
- Maynooth Environs Local Area Plan 2014 (incorporated into adopted MCDP);
- Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019);

Even though Maynooth Environs is situated in the Meath County Council administrative area, the Maynooth Environs Local Area Plan contains an objective to liaise with Kildare County Council in the identification, design, reservation and delivery of the section of the Maynooth Outer Relief Road located within the administrative area of Meath County Council. The administrative area of Kildare County Council is located immediately adjacent to the LAP environs lands and some infrastructure improvements will be located within the Kildare County Council (KCC) administrative area. Therefore, the design will also be conducted with due regard to:

- Maynooth LAP
- Kildare County Development Plan
- Maynooth Traffic Management Plan

OVERVIEW AND PURPOSE OF THE CDWMP

This report sets out the Outline Construction & Demolition Waste Management Plan (CDWMP) for the proposed development site. This CDWMP is a preliminary plan written by OCSC multidisciplinary design engineers and will be finalised after the granting of planning permission.

The purpose of this plan is to provide information necessary to outline the final management of Construction and Demolition (C&D) Waste at the site and that this is undertaken in accordance with current legal and industry standards including the *Waste*

Management Acts 1996 - 2013 and associated Regulations 1, *Protection of the Environment Act 2003* as amended with EPA Acts 1992 to 2013 2, *Litter Pollution Act 1997* as amended 3 and the *relevant Waste Management Plans* and to provide information necessary to ensure that the management of waste produced by the site is carried out in accordance with all current legal and environmental standards. This report has been prepared in accordance with the 'Best Practice Guidelines for the Preparation of Construction & Demolition Waste Management Plans for Construction and Demolition Projects' document produced by the Environmental Protection Agency.

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

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes: European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
- Waste Management (Collection Permit) Regulations (S.I. No. 820 of 2007) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, (S.I. No. 821 of 2007) as amended
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
- Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
- European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
- Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended

- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended

One priority of the CDWMP shall be to promote recycling, reuse and recovery of waste and diversion from landfills wherever possible. Guidance will also be given to ensure the appropriate method of transportation of waste is used to prevent littering or other serious environmental pollution. This plan aims to ensure maximum recycling, reuse and recovery of waste with a diversion from landfills, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

In preparation for the CDWMP, the following publications have been used as references:

- BEST PRACTICE GUIDELINES for the preparation of construction & demolition waste management plans for construction & demolition projects. Environmental Protection Agency 2021.
- Construction and Demolition waste management - A handbook for contractors and site managers, FAS and the construction industry federation 2002.
- In tandem with the launch of the National Construction and Demolition waste council, the Department of the Environment, Heritage and Local Government published the "Guidelines for preparation of waste management plans for construction and demolition projects".
- BS 10175:2011+A2:2017, Investigation of potentially contaminated sites, Code of Practice.
- EPA, 2015, Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous.

- EPA 2013, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- EPA 2007, Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites.
- EA, 2015, Guidance on the classification and assessment of waste, Technical Guidance WM3.
- EA, 2019, Land Contamination: Risk Management (CLRM).

These guidelines cover issues to be addressed from the preplanning stage right through to completion. These include:

- Predicted Construction and demolition wastes;
- Classification of material;
- Waste disposal/recycling of construction & demolition wastes at the site;
- List of the sequence of operations to be followed;
- Provision of training for waste managers and site crew;
- Details of the proposed record-keeping system;
- Details of waste audit procedures and plans;
- Details of consultation with relevant stakeholders.

OVERVIEW OF C&D WASTE MANAGEMENT IN IRELAND

Directive 2006/12/EC (repealed with effect from 12th of December 2010) of the European Parliament and of the Council of 19th November 2008 on waste and Directive 2008/98/EC (amended by Directive (EU) 2018/851 and approved by the EU in July 2018, and transposed into Irish Law in July 2020) which is transposed into Irish law by the Waste Management Acts and the European Communities (Waste Directive) Regulations 2011 (the "Waste Directive Regulations") in addition the national legislation is relevant.

The European council of ministers has adopted the revised waste framework directive, a decision that means member states will now be expected to reach a 70% recycling rate for non-hazardous construction and demolition by 2020. The Waste Directive 2008/98, which is transposed into Irish law by the Waste Management Acts and the

European Communities (Waste Directive) Regulations 2011 (the "Waste Directive Regulations") states that uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated will not be deemed to be waste. If it is used on a site elsewhere, it may or may not be waste depending on the individual circumstances of the case. It will not be waste if there is no intention to discard it.

The Third Schedule to the Waste Management Acts lists activities commonly regarded as disposal activities while common recovery activities are listed in the Fourth Schedule. Broadly, disposal means getting rid of waste forever by, for example, landfilling it or burning it without recovering the energy from it.

Directive 2008/98/EC lays down the five-step hierarchy of waste management options, with waste prevention as the preferred option, followed by re-use, recycling, recovery and safe disposal, in descending order.

The five-stage waste hierarchy, which is designed to prevent and reduce waste production, is made more certain and comprehensive and moved to a more prominent place in the Waste Directive 98/2008. Article 7 of the Waste Directive Regulations 2011, which came into force on March 31, 2011, transposes the waste hierarchy into Irish law. It is understood that it is not proposed to reuse any material on site with the possible exception of rubble from the demolition works. These will be confirmed by the Contractor and completed in accordance with all legislation. In addition, the directive also deals with the issue of "end of waste" and "by-products" and clarifies the definitions of recovery, disposal and by-product.

The Irish Government issued a policy statement in September 1998 known as 'Changing Our Ways', which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five-year period (by 2003), with a progressive increase to at least 85% over fifteen years (i. e. 2013). In response to the Changing Our Ways report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report

entitled 'Recycling of Construction and Demolition Waste' concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

The most recent national policy document was published in July 2012, entitled 'A Resource Opportunity - Waste Management Policy in Ireland'. This document stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions in relation to C&D waste and commits to undertake a review of specific producer responsibility requirements for C&D projects over a certain threshold.

The Environmental Protection Agency published a guidance document in 2021 BEST PRACTICE GUIDELINES for the preparation of construction & demolition waste management plans for construction & demolition projects. These guidelines outline the issues that need to be addressed from the pre-planning stage of development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for a waste manager and site crew;
- Details of the proposed record-keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies

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

LEGISLATIVE REQUIREMENTS

WASTE MANAGEMENT ACTS, 1996 AS AMENDED AND REGULATIONS MADE UNDER THE ACTS

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document A Resource Opportunity – Waste Management Policy in Ireland was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The strategy for the management of waste from the construction phase is in line with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects published in 2021. The guidance document Construction and Demolition Waste Management: A handbook for Contractors and Site Managers were also consulted in the preparation of this assessment.

The Waste Management Act, of 1996 (as amended) sets out the responsibilities and functions of various persons in relation to waste. In summary the act:-

- Prohibits a person from holding, transporting, recovering or disposing of waste in a manner which causes or is likely to cause environmental pollution.
- Requires any person who carries out activities of an agricultural, commercial or industrial nature to take all such reasonable steps as are necessary to prevent or minimise the production of waste.

- Prohibits the transfer of waste to any person other than an authorised person (i.e. a holder of a waste collection permit or a local authority.)
- Requires the environmental protection agency (EPA) to make a national plan in relation to hazardous waste.
- Requires local authorities to make waste management plans in relation to non-hazardous waste.
- Imposes certain obligations on local authorities to ensure that a service is provided for the collection of household waste and to provide facilities for the recovery and disposal of such waste;
- Enables the minister of the environment and local government to make regulations for various purposes to promote better waste management and provides for substantial penalties for offences including fines, imprisonment and/or liability for clean-up measures.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the EMR Waste Management Plan 2015 – 2021 and BS 5906:2005 Waste Management in Buildings – Code of Practice.

WASTE MANAGEMENT (COLLECTION PERMIT) REGULATIONS, 2007 AS AMENDED

Waste from the proposed development may only be collected by the holder of a waste collection permit or a local authority. The effect of s.34 of the Waste Management Acts is that waste (whether hazardous or not) should only be given to a haulier or collector who has the correct permit under the Waste Management (Collection Permit) Regulations 2008 (the "Waste Collection Permit Regulations"), or whatever regulations amend or replace them, to collect and transport the particular waste in question, or to a local authority.

Waste storage and collection areas on site should be designed to prevent environmental pollution.

WASTE MANAGEMENT (SHIPMENTS OF WASTE) REGULATIONS 2007 S.I. NO. 419

Where waste from the proposed development is exported outside of Ireland for recovery or disposal the national TFS office within Dublin City Council must be notified. Certain financial guarantees must be in place and certificates issued by the national TFS officer prior to the waste movement taking place. If the waste involved is hazardous, the contractor must ensure that it complies with the Waste Management (Hazardous Waste) Regulations 1998 (as amended) and the European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011, unless it is exempted from compliance with those Regulations under art.35 of the Collection Permit Regulations. Hazardous waste can only be given to a collector or haulier with a collection permit under the Waste Collection Permit Regulations and the collector or haulier must bring the waste to a licensed hazardous waste management facility and ensure that it is shipped within Ireland in accordance with the stringent requirements of the European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 and/or exported from Ireland in accordance with the Waste Management (Shipments of Waste) Regulations 2007 (as amended) and Council Regulation (EC) No. 1013/2006 on shipments of wastes, as amended (the "TFS Regulations").

POLICIES AND GUIDANCE – A HISTORY

DOEHLG – WASTE MANAGEMENT CHANGING OUR WAYS (SEPTEMBER 1998)

The October 1998 policy statement on waste management – "changing our ways" – outlines the government's policy objectives in relation to waste management and suggests some key issues and considerations that must be addressed in order to achieve these objectives. In particular, it focuses on the need to give clear and particle expression to the requirements of the hierarchy, by developing and pursuing integrated solutions, which combine progressive policies with a suitable and cost-effective waste infrastructure.

Changing our ways set the following ambitions targets for achievement over a fifteen-year time scale.

- A diversion of 50% of overall household waste away from landfill
- A minimum 65% reduction in biodegradable municipal wastes consigned to landfill
- The development of composing and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of organic waste annually.
- Materials recycling of 35% of municipal waste.
- Recovery of at least 50% of construction and demolition waste within a five-year period, with a progressive increase to at least 85% over fifteen years.
- Rationalisation of municipal waste landfills with progressive and sustained reductions in numbers, leading to an integrated network of some 20 or so state-of-the-art facilities incorporating energy recovery and high standards of environmental protection.

DOEHLG – PREVENTING AND RECYCLING WASTE – DELIVERING CHANGE – A POLICY STATEMENT (2002)

The government added to the messages presented in waste management “changing our ways” with the publication of preventing and recycling waste – delivering change 2002. In addition to setting objectives, the policy statement set out how these might be achieved through investment from the national development plan in waste infrastructure. The key objectives of the policy statement are:

- The setting up of a market development group focusing on markets for recyclables.
- Formulating a national strategy on biodegradable waste policy.
- Expansion of the network of civic amenity sites and materials recycling facilities.

DOEHLG – WASTE MANAGEMENT – TAKING STOCK AND MOVING FORWARD (2004)

Waste management – taking stock and moving forward reviews progress of implementing key policies including the national waste prevention to 2004. It sets up a framework for implementing key policies including the national waste prevention programme and the setting up of a market development group. It also sets an objective

date of 1st January 2005 for the implementation of user-based sharing for waste collection.

DOEHLG – NATIONAL STRATEGY ON BIODEGRADABLE WASTE (2021)

The national strategy on biodegradable municipal waste published by the DoEHLG in 2021 sets out measures to progressively divert biodegradable municipal waste from landfill in accordance with the agreed targets in EU Directive 1999/31/EC on the landfill of waste (landfill Directive). By 2016, the region of 1.8 million tonnes of biodegradable municipal waste will need to be diverted annually in order to meet the directive's targets.

The strategy is based on the integrated waste management approach established as government policy since the publication of "change our ways" in 1998. The preferred options for dealing with biodegradable municipal waste (BMW) are:

- Prevention and minimisation – avoiding generating waste.
- Recycling – mainly paper and cardboard but also textiles.
- Biological treatment – mainly of kitchen and garden waste including composting.
- Residual treatments – thermal treatment with energy recovery by way of mechanical biological treatment.

WASTE MANAGEMENT PLAN FOR THE DUBLIN REGION 2005-2010

The Dublin Region Waste Management Plan 2005-2010 aims toward achieving 59% recycling, 25% incineration and 16% landfill. The 2011 annual progress report shows waste management rates are improving year on year. The household recycling rate is up 3%- 44%, municipal waste recovery is up 1% to 47% and landfilling has decreased by 1% to 53%. The region remains overly reliant on the landfill with 49% of commercial waste sent for disposal. There remains a need to develop recovery alternatives for residual waste.

EASTERN - MIDLANDS REGIONAL WASTE MANAGEMENT PLAN 2015 – 2021

The Eastern Midlands Regional Waste Management Plan 2015-2021 identified the following targets:

- Preparing for reuse and recycling rate of 60-70% of Municipal Waste by the end of 2030.
- Eliminate the use of landfilling of all major waste streams including municipal, industrial and construction and demolition wastes in favour of recovery of residual wastes.

NATIONAL WASTE PREVENTION PROGRAMME (NWPP)

A National Waste Prevention Programme (NWPP) operated by the EPA, focuses on reporting on the prevention and minimization of waste. It produces annual progress reports. A Resource Efficiency Unit (formerly known as the Core Prevention Team), within the EPA, promotes waste minimization. A Prevention Programme Steering Group also known as the NWPP Steering Committee was established to "liaise with public authorities, monitor the overall thrust of the NWPP, and provide strategic direction to the CPT." A new National Waste Prevention Plan entitled "Towards a Resource Efficient Ireland, A National Strategy to 2020" was published in 2014. A report on the Overview of progress made on waste prevention projects during 2014 was published by the EPA in 2015 and is available on its website.

2 PROJECT DESCRIPTION

STUDY AREA

The subject site is located on the southernmost extent of County Meath, as shown in Figure 1, aligning with the county boundary to Co. Kildare. It is approximately 1.5km north of the town of Maynooth, Co. Kildare, which forms part of a larger strategic landbank on zoned lands known as Maynooth Environs. The site is immediately bound by:

- R157 Maynooth – Dunboyne Road, to the east;
- Agricultural lands, to the north and west; and
- River Rye Water, to the south;

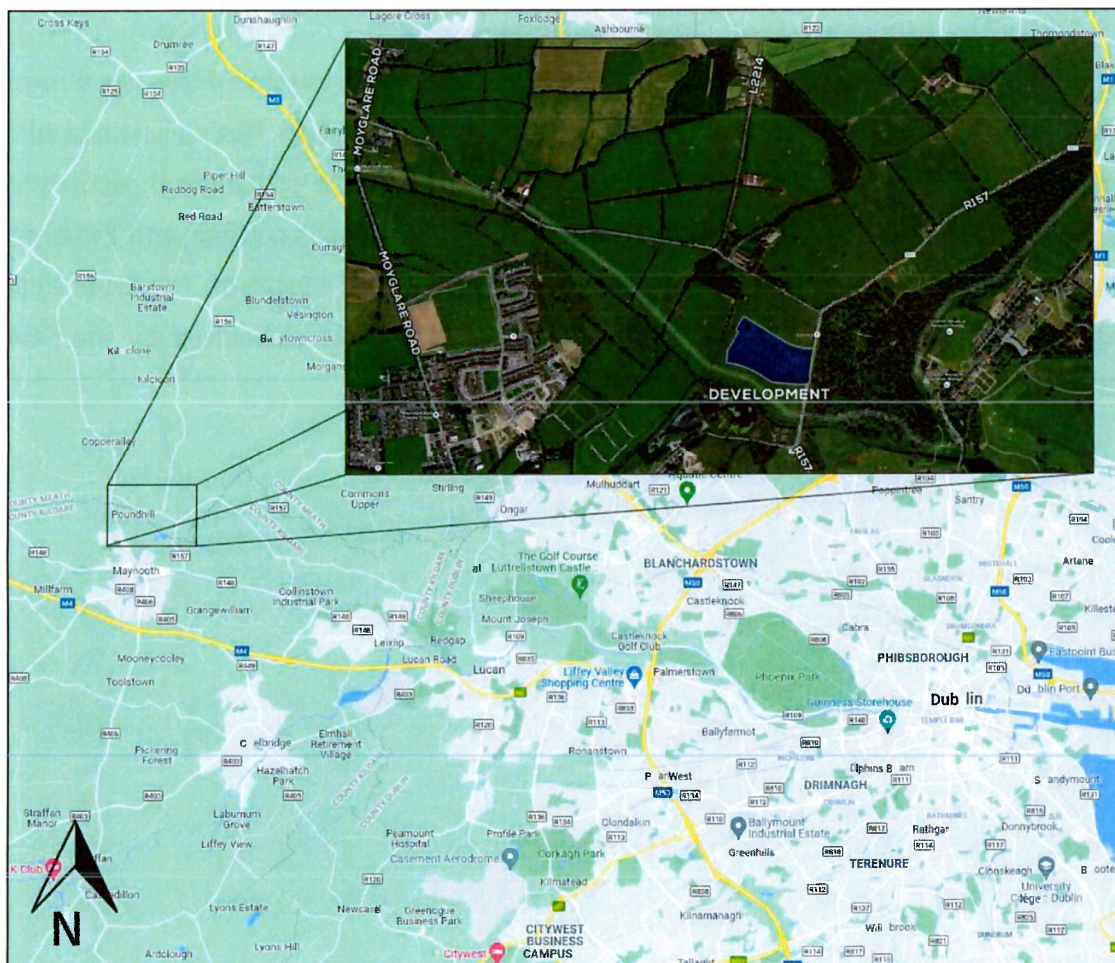


Figure 1: Development Locality Plan

DEVELOPMENT DESCRIPTION

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.

The proposed development comprises:

1. Construction of a new two-storey Nursing Home of 156 no. bedrooms with a Gross Floor Area (GFA) of 8,576m², including vehicular drop-off area and service road.
2. Construction of a new three-storey Primary Care Centre (PCC) with a Gross Floor Area (GFA) of 3,049m², including vehicular drop-off area.
3. The development includes a shared surface car park providing 161 no. car parking spaces (comprising of 151 no. standard car parking spaces and 10 no. accessible car parking spaces) and approximately 160 no. bicycle parking spaces.
4. Provision of foul and surface water drainage including an underground wastewater pumping station.
5. Connection to potable water supply at Kildare Bridge.
6. Provision of communal (semi-private) and public open space.
7. Provision of hard and soft landscaping including amenity equipment, fencing and gates.
8. Provision of substation and public lighting.
9. Proposed road improvement and realignment works along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556), including:
 - (i) Construction of a new 2-way, 6m-wide access road from the R157 Dunboyne Road to include a priority T-junction on the R157 which includes a right-turn lane from the R157 into the access road,
 - (ii) Upgrade works to a section of the R157 from the new site entrance south to Kildare Bridge on the R157 (representing delivery of a 15m-wide portion of the Maynooth Outer Relief Road (MOOR)), including creation of a new 2m-wide footpath, 3m-wide cycle lane and pedestrian and cycle link adjacent to Kildare Bridge,
 - (iii) Provision of pedestrian and cycle improvement measures.

10. All other site development works and services ancillary to the proposed development.
11. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the planning application.

DEVELOPMENT & SITE OVERVIEW

The overall gross site area is **c.8-hectares** and is zoned by Meath County Council for **Community Infrastructure** in the Meath County Development Plan 2021 - 2027.

The site is currently greenfield and used for agricultural purposes and can be accessed from the R157, Maynooth to Dunboyne Road, which aligns with the eastern boundary of the subject site. Ground levels across the site typically fall gently from north to south, with a sharp decline at the southern and eastern boundaries, which align with the River Rye Water and Moyglare Stream respectively.

The proposed development at Moygaddy consists of the construction of a Primary Care Centre (PCC) and Nursing Home Unit; with access provided from the R157, which aligns with the eastern boundary of the proposed site. The proposed works also include the upgrading of a section of the R157 from Kildare Bridge, south of the proposed site, to the proposed development entrance. Additional to this, will be the creation of new internal access roads and car parking.

A separate application will be made to the Kildare County Council for the upgrade of the R157 south of the Kildare Bridge. This overlap of applications will ensure unimpeded access to the proposed development lands for all modes of transport including vehicular and dedicated pedestrian and cyclists facilities.

The proposed site layout is shown in Figure 2 overleaf.

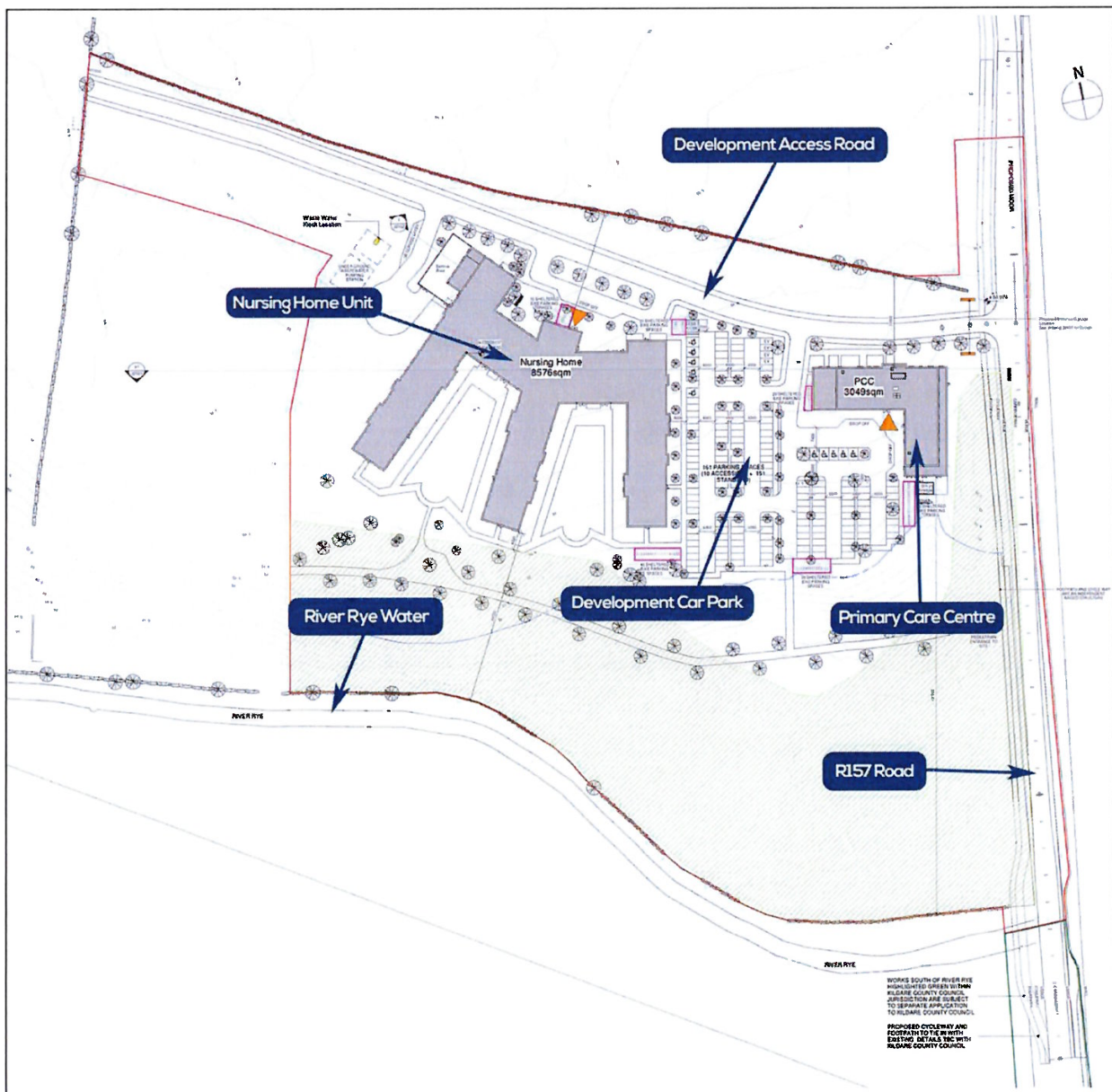


Figure 2: Proposed Development Layout

PHASING & CONSTRUCTION

Given the limited size and scale of the proposed development it is expected that it will be developed in two individual, but sequential phases:

- Phase 1: Primary Care Centre

- Phase 2: Nursing Home

Subject to tender, individual contractors may be appointed to construct each phase as one development.

At present, the planned construction programme for the development is a commencement date of September 2023, with a target completion date of December 2025. This means that the planned construction duration is 27 months.

The phasing will be scheduled as follows:

- Phase 1: Primary Care Centre – month 0 to month 14
- Phase 2: Nursing Home – month 12 – month 27

This means that there will be a 2-month overlap between the two phases.

3 KEY MATERIALS & QUANTITIES

CONSTRUCTION PHASE WASTE

The bulk of waste material generated from the proposed development will be from the excavation of the subsoil to accommodate the construction of the under-croft and foundation structures.

Soil generated as part of the construction works will be managed in accordance with a *Soil Waste Management Plan* to be produced by an environmental management company based on the site investigation results in advance of the construction stage. That report will identify the nature and classification of the soil waste and will detail management procedures to be implemented to ensure appropriate handling and disposal in accordance with Irish and EU legislative requirements.

Additional waste as part of construction activities is expected. This waste will be produced from surplus materials such as broken or cut-offs of concrete blocks, bricks, tiles, timber, steel reinforcement etc. Waste from packaging and the oversupply of materials is also expected and should be recycled where possible.

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

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

CATEGORIES OF CONSTRUCTION WASTE GENERATED

The European Waste Catalogue (EWC) classifies waste materials and categorises them according to what they are and how they are produced. It is referred to in a number of European Union directives and commission decisions regarding waste management.

In 1994, the first European waste catalogue and the hazardous waste list were published as two separate documents. The lists were used by the Environment Protection Agency for the compilation of waste data from 1995 and were adopted into Irish legislation by the Waste Management Act 1996. In 1996 the Environmental Protection Agency published a single list incorporated both the European Waste Catalogue and the Hazardous waste list. The European Waste Catalogue and the hazardous waste list are used for the classification of all wastes and hazardous wastes and are designed to form a consistent waste classification system across the EU. They form the basis of all national and international waste reporting obligations, such as those associated with waste licences and permits, the national waste database and the transport of waste. The EPA published a more concise guide of these in January 2002.

Correct classification is the foundation for ensuring that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and is in compliance with legal requirements.

The waste classification system applies across the EU and is the basis for all national and international waste reporting obligations. From 1 June 2015, waste classification is based on:

- Commission Decision of 18 December 2014, amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council (2014/955/EEC) [referred to hereafter as 'The List of Waste (LoW)'].
- Commission Regulation (EU) No 1357/2014 of 18 December 2014, replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives.

The aforementioned document consolidates the legislation and allows the generators of waste to classify the waste as hazardous or non-hazardous and in the process assign the correct List of Waste entry. It also replaces the 2002 European Waste Catalogue and the Hazardous Waste List

A non-exhaustive List of Waste expected for typical waste materials to be generated for this site is as follows and available online Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous APPLICABLE FROM 5 JULY 2018:

17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 06*	mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 02 01	wood
17 02 02	glass
17 02 03	plastic
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances
17 05 03*	soil and stones containing hazardous substances
17 05 04	soil and stones other than those mentioned in 17 05 03*
17 06 01*	insulation materials containing asbestos
17 06 03*	other insulation materials consisting of or containing hazardous substances
17 06 04	insulation materials other than those mentioned in 17 06 01* and 17 06 03*
17 06 05*	construction materials containing asbestos
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03

Table 1: Construction & Demolition Wastes

ANTICIPATED CONSTRUCTION HAZARDOUS WASTE

Fuels used during construction will be classed as hazardous and these will be stored (for site machinery etc.), in suitable tanks with the draw-off points bunded. Where this is the case, it is not expected that there will be any fuel wastage.

Waste mixtures contain dangerous substances classified as hazardous waste. This will not be used as fill on the site and only be disposed of in a licensed hazardous waste facility.

ESTIMATED CONSTRUCTION WASTE GENERATED

Taken from the Irish EPA figures, the following is the breakdown of construction and demolition waste types expected to be generated from a typical site such as this per m².

Waste Types	%
Soil & Stones	83
Concrete, Bricks, tiles, plastics etc	13
Asphalt, tar/tar products	1
Metals	1
Others	2
Total Waste	100

Table 2: Waste materials generated from a typical Irish construction site

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

If the material is deemed to be waste, then removal and reuse/recovery/disposal of the material will be carried out in accordance with the Waste Management Acts 1996 – 2011 as amended, the Waste Management (Collection Permit) Regulations 2007 as amended and the Waste Management (Facility Permit & Registration) Regulations 2007 as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste-permitted and licensed sites will be considered.

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

Category	Qualifying Criteria
Category A	Inert Material, suitable for disposal at a waste permitted site in Ireland
Category B	Inert Material is suitable for disposal at an inert waste landfill in Ireland. Note this can be subdivided into B1 and B2
Category C	Non-hazardous material, suitable for disposal at a landfill facility in Ireland or for disposal/recovery in continental Europe
Category D	Hazardous material as defined by the application of the 'Hazardous Waste Classification Tool'5 is suitable for disposal/recovery in Continental Europe.

Table 3: Waste Categories

The following table shows typical target values for the management of waste at the site, to be completed by the contractor prior to starting on site.

Waste Types	Waste	Reuse/Recover		Recycle		Disposal	
	tonnes	%	tonnes	%	tonnes	%	tonnes
Soil & Stones	10600	20	2120	0	0	80	8480
Concrete, Bricks, tiles, plastics etc	1660	0	0	80	1328	20	332
Asphalt, tar/tar products	128	0	0	20	26	80	102
Metals	128	5	6	90	115	5	6
Others	255	10	26	40	102	50	128
Total	12771	-	2152	-	1571	-	9048

Table 4: Predicted construction waste targets for the proposed development

4 SITE WASTE MANAGEMENT PLAN

Waste materials generated will be segregated on site. This will allow for the maximum possible degree of recycling. Where on-site segregation of certain waste types is not practical, off-site segregation will be carried out. Skips and receptacles will be provided to facilitate segregation at the source.

All waste receptacles leaving the site will be covered or enclosed. The on-site waste storage area will be secured within the overall site which will be hoarded off from the public and unauthorised access.

The appointed waste contractor will collect and transfer the waste as receptacles are filled. Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2008, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off-site will be disposed of at a facility holding the appropriate licence or permit, as required. Written records will be maintained by the contractor(s) detailing the waste arising throughout the construction phase, the classification of each waste type, the contact details and the waste collection permit number of all waste contractors who collect waste from the site and the end destination and waste facility permit or licence number for all waste removed and disposed of off-site.

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

The management of the main waste streams is detailed in the figure overleaf:



Figure 3: Proposed C&D Waste Storage Area (Scale: NTS)

WASTE MANAGEMENT CATEGORIES

SOIL/SUBSOIL

Any soil removed off-site will be carried by contractors licensed under the Waste Management Acts 1996 - 2011, the Waste Management (Collection Permit) Regulations 2007 and Amendments and the Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments.

If any of the excavated spoil is found to be clean/inert, the site manager will investigate whether nearby construction sites may require clean fill material, to both minimise the costs of transport and to reuse as much material as possible. Any soil/subsoil deemed to be contaminated will be stored separately from the clean and inert soil/subsoil. The material will be appropriately classified as non-hazardous or hazardous under the www.hazwasteonline.com application and EC Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills, before being transported to an appropriately permitted/licensed facility by permitted contractors.

CONCRETE, BRICKS, TILES & CERAMICS

The majority of concrete, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

HARD PLASTIC

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

TIMBER

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be segregated and stored in skips.

METAL

Metals will be segregated into mixed ferrous, cladding, aluminium, high-grade stainless steel, low-grade stainless steel etc. categories, where practical. Metal is highly recyclable and numerous companies will accept these materials. Metals will be segregated and stored in skips.

PLASTERBOARD

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

GLASS

Glass materials will be segregated for recycling, where possible.

ORGANIC (FOOD) WASTE

An on-site canteen will be provided to allow workers to prepare and eat food. This facility will incorporate provisions so that organic waste will be segregated for separate collection. Segregation at source and separate collection of organic waste is required under the Waste Management (Food Waste) Regulations 2009 (if food is prepared on-site).

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

WEEE that does not contain hazardous components will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling. There are not expected to be any significant amounts of such materials as there are no existing buildings on the subject site.

NON-RECYCLABLE WASTE

C&D waste which is not suitable for reuse or recovery will be placed in separate skips or other receptacles. This will include polystyrene, some cardboard and plastic which are deemed unsuitable for recycling.

Before removal from the site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team to determine if recyclable materials have been misplaced. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

HAZARDOUS WASTES

On-site storage of any hazardous wastes produced (i.e. contaminated soil and/or waste fuels) will be kept to a minimum, with removal off-site organised regularly. Storage of all hazardous wastes on site will be undertaken to minimise exposure to on-site personnel and the public and to also minimise the potential for environmental impacts.

MANAGEMENT & CONTROL SYSTEMS

It will be the role of an appointed Waste Manager to try to find alternative options for waste before sending it to the landfill. Waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the Waste Management (Collection Permit) Regulations 2007 as amended. The contractor will provide the Waste Manager on site with documentation of

the waste to be removed and a copy of the waste collection permit. Before the waste leaves the site, the Waste Manager will have documentation to show where the waste is being taken to, and that the facility is licensed to accept the particular waste. A receipt will be issued for each load that leaves the site.

All waste will be documented before leaving the site. Waste will be weighed by the contractor, either by a weighting mechanism on the truck or at the receiving facility. These waste records will be maintained on-site by the Contractor. All movement of waste and the use of waste contractors will be undertaken under the Waste Management Acts 1996 - 2008, Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project Waste Manager will maintain a copy of all waste collection permits.

Some wastes may be transported to another site for reuse on that site. The Waste Manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc. All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off-site will be covered to prevent dust or particle emissions from the load.

If the waste is being transported to another site, a copy of the Local Authority waste permit or EPA Waste Licence for that site will be provided to the nominated project Waste Manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document will be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

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

SITE MANAGEMENT

RESOURCE MANAGER

A dedicated Resource manager will be appointed to ensure commitment, efficiency and site protocols are upheld during the construction stage.

The role of the Resource manager will be to record, oversee and manage the everyday handling of waste on the site.

Their training will be in setup and maintaining record-keeping systems and how to produce an audit to ensure waste management targets are being met.

They shall also be trained in the best methods for the segregation and storage of recyclables. They will also be familiar with the suitability of material reuse and know how to implement the CDWMP.

Dún Laoghaire-Rathdown County Council will be consulted throughout the Construction phase to ensure that all available waste reduction, reuse and recycling options are being explored and utilised and that compliant Waste Management is being carried out at the site.

SITE CREW

This shall be the responsibility of the resource manager and a training programme will be organised, and incorporated into typical onsite inductions to give an awareness of waste segregation on the site.

This will outline the types and treatments that should be given to different materials and hazardous materials.

DOCUMENTATION

All waste will be weighed and documented prior to leaving the site. Records will be kept at the site and at the relevant waste facility.

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project waste manager.

Construction and Demolition municipal waste will be separated and stored wherever possible and monitored/inspected by the site foreperson prior to removal to ensure that site protocol for recycling is being adhered to.

RECORD KEEPING

Specialist companies, where required, will be contacted to determine their suitability and each company's record reviewed to ensure relevant current collection permits/licenses are held.

Companies will also be contacted to gather information regarding the treatment of hazardous materials and if required costs of handling and the best methods of transportation for recycling or reuse when hauling off-site.

Records shall be kept for each material leaving the site for all types of use or disposal. This shall take the following basic outline form:

- Waste taken for reuse off-site
- Waste taken for recycling
- Waste taken for disposal

- Reclaimed waste materials brought to the site for reuse.

For any movement of waste, a docket shall be signed and recorded by the waste manager, detailing the type and weight of material and source or destination.

This will be readily comparable with all delivery records to the site, so a waste generation percentage for each material can be determined.

This will allow ease of comparison of figures with targets established for the recovery, reuse and recycling of Construction waste. It will also highlight the source of failure in meeting these targets.

WASTE AUDITS

The resource manager shall perform audits at the site during the complete construction phase of the works.

This shall ensure that all records are maintained for all movements of all materials.

Records shall also be readily available for comparison with the site's targets.

At the completion of the Construction phase, a final report will be prepared to outline the results of the Resource Management process and the total reuse, recycling and recovery figures for the site.

SIGNAGE

The resource manager shall ensure that appropriate signage is in place

STORAGE

The resource manager shall ensure that appropriate storage is provided for the different waste streams including:

- Dedicated skips
- Hazardous materials storage
- Stockpile management

5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Assuming all the proposed mitigation measures are implemented, the following impacts are expected to arise as a result of the proposed development.

CONSTRUCTION PHASE

Significant volumes of waste materials will be generated during the construction of the proposed development. Careful management of waste including segregation at source will help to ensure maximum recycling, reuse and recovery are achieved, in accordance with current local national waste targets.

It is expected however that a certain amount of waste will still need to be disposed of at landfill. Assuming appropriate facilities are provided, environmental impacts (e.g. litter, contamination of soil or water etc.) arising from waste storage are expected to be minimal. Particular attention must be given to the appropriate management of construction waste containing contaminated or hazardous materials. The use of suitably licenced waste contractors will ensure compliance with relevant legal requirements and appropriate off-site management of waste.

In summary, if the final CDWMP is implemented and a high level of due diligence is carried out at the site, it is envisaged that the environmental impact of the construction phase of the proposed development will be short-term and slight, with respect to waste management.

OPERATION PHASE

As with the construction phase, waste materials will be generated during the operational phase of the proposed development. Again, careful management of these, including segregation at source, will help ensure acceptable local and national waste targets are met. It is expected that some waste, for example, mixed non-recyclables will still be required to be disposed of at landfill.

Assuming appropriate on-site storage is provided, environmental impacts (e.g. litter and to a lesser extent contamination of soil and water etc.) arising from waste storage are expected to be minimal. Bin stores will be located throughout the development. The use of suitably licenced waste contractors will ensure compliance with the relevant legal requirements and appropriate off-site management of waste.

In summary, if the operational phase management plan is implemented and a high level of due diligence is carried out at the site, it is envisaged that the environmental impact of the operation phase of the proposed development will be long-term and slight, with respect to waste management. A separate Operation Waste Management Plan has been prepared for this phase.

6. VERIFICATION

This report was compiled and verified by:

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APPENDIX 4-5

OPERATIONAL WASTE MANAGEMENT PLAN

**OPERATIONAL
WASTE MANAGEMENT PLAN**

FOR

**SKY CASTLE LIMITED
23 ROCKHILL
BLACKROCK
Co. DUBLIN**

RELATING TO

**HEALTHCARE FACILITIES
(PRIMARY CARE CENTRE)**

AT

**MOYGADDY, MAYNOOTH,
Co. MEATH**

22nd August 2022



Ian Byrne MSc, MIOA, Dip Environmental & Planning Law

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Appendix I Segregation & Packaging of Healthcare Risk & Non-Risk Waste

1.0 INTRODUCTION

This document presents the Operational Waste Management Plan (OWMP) for the control, management and monitoring of waste associated with the Healthcare Facilities Primary Care Centre at Moygaddy, Maynooth, Co. Meath.

The proposed Primary Care Centre (PCC) will be a three floor building comprising a reception, pharmacy, café, dental suits, offices and consulting rooms, clinic rooms, offices and staff facilities.

The **Objective of this OWMP** is to maximise the quantity of waste recycled by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information to the operators and users of the development.

The **Goals of this OWMP** are to

- Achieve and surpass a recycling rate of 50% of managed municipal waste in accordance with the current *Eastern-Midlands Region Waste Management Plan 2015-2021*. (Note Regional Waste Management Plans are currently under review and future publications shall be integrated into the OWMP).
- Ensure that all Clinical Waste is managed, stored and disposed of in accordance with the *Health Service Executive's Waste Management Awareness Handbook (2014)*.

The OWMP shall be integrated into the design and operation of the development to ensure the following:

- That sufficient waste management infrastructure is included in the design of the development to minimise the generation of mixed waste streams.
- That the principle of waste segregation at source is integrated into the development by the provision of separate bin systems.
- That all Non-Clinical waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.
- That all Clinical Wastes are removed from site by appropriately permitted hazardous waste contractors accompanied by a Waste Transfer Form (WTF) in accordance with the *Waste Management (Movement of Hazardous Waste) Regulations, 1998, S.I. No. 147/1998*.

2.0 WASTE MANAGEMENT GUIDANCE & POLICIES

This OWMP has been prepared with regard to the relevant waste management objectives and policies contained in Meath County Council's Development Plan 2021 - 2027 as follows:

*DM OBJ 5: Building design which minimises resource consumption, **reduces waste**, water and energy use shall be incorporated where possible in all new developments.*

INF POL 64 To encourage and support the expansion and improvement of a three-bin system (mixed dry recyclables, organic waste and residual waste) in order to increase the quantity and quality of materials collected for recycling in conjunction with relevant stakeholders.

This OWMP has been prepared with regard to the management of clinical wastes *Health Service Executive's (HSE) Waste Management Awareness Handbook (2014)*.

This OWMP has been prepared with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of storage, collection, segregation for recycling and recovery of wastes in non-domestic buildings.

3.0 KEY ASPECTS TO ACHIEVE WASTE RECYCLING TARGETS

The OWMP is defined by the following stages of waste management with regard to the Circular Economy and the Waste Hierarchy

Stage 1	Source Segregation
Stage 2	On-Site Deposit and Storage
Stage 3	Bulk Storage and On-Site Management
Stage 4	Off-Site Removal
Stage 5	Documented End Destination of wastes

4.0 WASTE TYPES TO BE GENERATED

Waste generated will fall into two distinct categories as follows:

4.1 Non-Clinical Wastes generated from the general operation of the PCC

- Dry Recyclable Materials:
- Paper/Cardboard
- Plastics
- Glass
- Organic food waste
- Mixed non-recyclable waste
- Batteries

- Ink Toners
- WEEE
- Fluorescent Bulbs
- Maintenance Oils
- Food Oils
- Textiles
- Bulky Waste (Furniture)

4.2 Clinical Wastes generated by patient care at the PCC

- Incontinence wear, stoma bags, urinary drainage bags,
- Wound drains, catheters, fluids
- Dressings, Swabs, Bandages, Gloves, Sharps (needles, syringes)
- Medicines and Pharmaceuticals

The Circular Economy

Ireland's national waste policy is 'A Waste Action Plan for A Circular Economy – Ireland's National Waste Policy 2020 – 2025'. The policy, published September 2020, is intended to move Ireland toward a circular economy in which focus is shifted away from waste disposal, favouring circularity and sustainability by identifying and maximising the value of material through improved design, durability, repair and recycling. By extending the time resources are kept within the local economy, both environmental and economic benefits are foreseen.

The OWMP complies with the waste hierarchy whereby waste prevention is the most preferred strategy. Where waste generation is unavoidable, re-use is the most preferred fate, followed by recycling and then energy recovery, with disposal (e.g. to landfill) being the least preferred fate.

Figure 1 The Waste Hierarchy

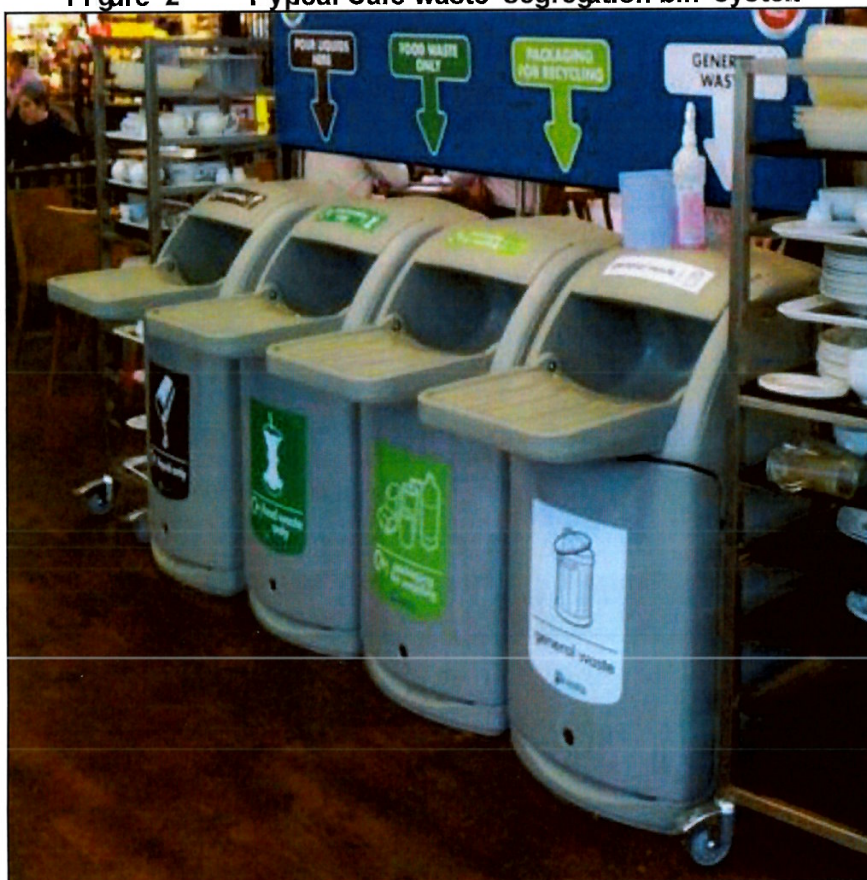


5.0 WASTE SEGREGATION AT SOURCE FOR NON-CLINICAL WASTE

The Cafe shall include a 6-bin waste system to facilitate the segregation of waste at source for

Organic compostable food waste
Plastics
Cans
Paper and Cardboard
Non-recyclable mixed waste
Glass

Figure 2 Typical Cafe waste segregation bin system



Offices and Administration areas shall include a 7-bin waste system to facilitate the segregation of waste at source for

Organic compostable waste
Plastics
Paper and Cardboard
Cans
Non-recyclable mixed waste
Glass
WEEE

Figure 3 Typical Office waste segregation bin system



Figure 4 WEEE & Battery Recycling System



6.0 WASTE SEGREGATION AT SOURCE FOR CLINICAL WASTE

All clinical wastes shall be temporarily stored in dedicated clinical waste only storage rooms (Dirty Store) located on the ground floor of the PCC building. Images of clinical waste storage bins and containers are presented in Figures 5 & 6. Further details on Clinical risk waste storage vessels are presented in Appendix I.

Figure 5 Typical Internal Clinical Waste Bin



Figure 6 Typical Internal Secure Clinical Waste Container



7.0 EXTERNAL WASTE STORAGE AREA

The external waste storage area shall be designed to include the following aspects:

- The waste storage area shall be fitted with sensor lighting.
- The waste storage area shall include ground drainage to allow for its regular cleaning and disinfection.
- The Facilities Management Company shall engage a mobile bin cleaning service provider to clean waste bins as required.
- The waste storage area shall have a separated and dedicated Clinical waste storage area containing secure weather-proof storage containers.
- The waste storage area shall contain the following 1100 litre bulk bins for the following waste streams:

7.1 Non-Clinical Waste Storage

- Green Bins for paper/cardboard/plastic/can recycling
- Grey Bins for unrecyclable mixed waste
- Brown Bins for organic food waste
- Glass Bins
- WEEE Recycling Cage
- Battery Boxes
- Fluorescent Lamp Boxes

WEEE Battery & Lamp Recycling

Waste Electrical and Electronic Equipment (WEEE) Batteries and Fluorescent Lamps shall be safely stored in dedicated WEEE recycling cages, Battery Boxes and Lamp Boxes supplied by WEEE Ireland as shown in Figures 5,6 and 7 below. These items contain precious metals, plastics and glass which can be recovered for re-use.

Figure 7 Lamp Recycling Box



Figure 8 Image of Battery Recycling Box



Figure 9 Glass Recycling Bin



Waste Oil Management & Recycling

Waste oils will be generated from plant maintenance and from food preparation in the cafe. Oils can be processed recycled and reused by specialist waste contractors including ENVA. Maintenance and cooking oils shall be separately stored in secure containers as indicated in Figures 8 & 9.

Figure 10 Image of waste cooking oil storage containers



Figure 11 Image of waste maintenance oil storage container



7.2 Clinical Waste Storage

The external clinical waste storage area shall be designed to include the following aspects:

- All Clinical waste shall be contained in a secure, separate and segregated area within the waste storage area.
- All Clinical waste receptacles shall be stored in covered section of the waste storage area in either a secure container or bunker unit.
- Appropriate warning signs indicating the presence of healthcare risk waste/bio hazard shall be displayed at the entrance to the Clinical waste storage area
- Spill kits shall be maintained in the Clinical Waste Storage Area

Figure 12 Image of Clinical Waste Bunker



Figure 13 Image of Clinical Waste Storage Container



Figure 14 Image of Clinical Waste Yellow Wheelie Bins



8.0 GENERATED WASTE TYPES & QUANTITIES

Table 1 presents the calculated Non-Clinical waste that will be generated at the PCC on a weekly basis

Table 1 Non-Clinical Waste Types per day/week

Waste Type	% Waste	Kg/week	Kg/day
Organic waste	30.6	254.9	36.4
Paper	12.5	104.1	14.9
Cardboard	3.6	30.0	4.3
Composites	1	8.3	1.2
Textiles	15.5	129.1	18.4
Plastics	13.6	113.3	16.2
Glass	3.4	28.3	4.0
Metals	3.1	25.8	3.7
Wood	1.2	10.0	1.4
Hazardous municipal waste	0.9	7.5	1.1
Unclassified combustables	1.4	11.7	1.7
Unclassified incombustables	1.2	10.0	1.4
Fines	11.7	97.5	13.9
Bulky Waste & WEEE	0.3	2.5	0.4
Totals	100	833	119

To determine the estimated quantity of Clinical waste that will be generated, a value of 0.3Kg/patient/day has been assumed.

Table 2 Clinical Waste Types per day/week

Waste Type	Kg/day	Kg/week
Clinical Waste	60	420

9.0 WASTE STORAGE AREA DESIGN

The waste storage area shall be of sufficient size to house all Non-Clinical and Clinical waste receptacles and allow movement of waste collection vehicles.

Table 3 PCC Waste Storage Area Requirements

Waste Storage Area	Minimum Bin Storage Area (m ²)
Non-Clinical Waste	16
Clinical Waste	4
Total	20

10.0 WASTE MANAGEMENT DUTIES OF THE FACILITY MANAGEMENT COMPANY

Internal & External Waste Management

The Facilities Management Company shall be responsible for the movement of all Clinical and Non-Clinical wastes from within the building to the external waste storage area and the maintenance of both internal and external waste storage areas.

Waste Management & Record Keeping

The Facilities Management Company shall maintain a weekly register detailing the quantities and breakdown of both Clinical and Non-Clinical wastes removed from the development.

Visitor Waste Management

The Facilities Management Company shall maintain 3-bin systems throughout the building, an example of which is shown below.

Image of internal 3-bin waste segregation bin system



11.0 CONCLUSIONS

The proposed Primary Care Centre at Moygaddy, Co. Meath shall be designed and managed to provide the operators with the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling Non-Clinical waste streams.

The management of Clinical waste will be managed, stored and transported off-site in accordance with *Health Service Executive's (HSE) Waste Management Awareness Handbook (2014)*.

APPENDIX I Segregation & Packaging of Healthcare Risk & Non-Risk Waste

RISK WASTE		
YELLOW BAG  • All blood-stained items and all items soiled with body fluids assessed as infectious • Suction catheters & tubing • Incontinence waste from known or suspected enteric infections * NO SHARPS OR FREE LIQUIDS	YELLOW SHARPS BIN (with blue or red lid)  • Needles, Syringes & Scalpels • Contaminated slides & glass • Sharps tips of clear IV giving sets • Blood stained glass • Stitch cutters • Guide wires/trocars • Razors * NO FREE LIQUIDS	YELLOW 30/60 LITRE RIGID BIN (with yellow lid)  • Blood administration sets (never disconnect line from bag) • Contained blood and body fluids • Non-cultured laboratory waste (including autoclaved microbiological cultures) • Disposable suction liners • Redivac drains (ensure drain closure sealed) • Sputum containers • Chest drains * NO SHARPS OR FREE LIQUIDS

RISK WASTE		
YELLOW 30/60 LITRE RIGID BIN (with purple lid)		• Cytotoxic drugs including infusion lines, left over drug preparations and personal protective equipment used. • Small quantities of residual medicines or pharmaceuticals left over after administration to patients. * NO SHARPS OR FREE LIQUIDS
YELLOW SHARPS BIN (with purple lid)		• Contaminated cytotoxic sharps, needles, syringes, sharp instruments and broken glass * NO FREE LIQUIDS
YELLOW RIGID BIN (with black lid)		• Non-autoclaved microbiological cultures • Large / recognisable anatomical body parts • Placentas with additional leak proof containment • Large solid metal objects and instruments * NO SHARPS OR FREE LIQUIDS

NON-RISK WASTE

CLEAR BAG



- Incontinence wear (from non-infectious patients)
- Oxygen face masks
- Empty urinary drainage and empty stoma drainage bags
- Clear tubing (e.g. oxygen, urinary catheters, ventilator, naso gastric, IV lines with tips removed)
- Enteral feeding equipment
- Non contaminated gloves, aprons and masks
- Empty continuous ambulatory peritoneal dialysis (CAPD) bags

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Sky Castle Ltd – Moygaddy Healthcare Facilities (Primary Care Centre))
Operational Waste Management Plan

**OPERATIONAL
WASTE MANAGEMENT PLAN**

FOR

**SKY CASTLE LIMITED
23 ROCKHILL
BLACKROCK
Co. DUBLIN**

RELATING TO

**HEALTHCARE FACILITIES
(NURSING HOME)**

AT

**MOYGADDY, MAYNOOTH,
Co. MEATH**

22nd August 2022



Ian Byrne MSc, MIOA, Dip Environmental & Planning Law

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1.0 INTRODUCTION

This document presents the Operational Waste Management Plan (OWMP) for the control, management and monitoring of waste associated with the proposed Healthcare Facilities Nursing Home at Moygaddy, Maynooth, Co. Meath.

The proposed Nursing Home development will consist of 156 no. beds.

The **Objective of this OWMP** is to maximise the quantity of waste recycled by providing sufficient waste recycling infrastructure, waste reduction initiatives and waste collection and waste management information to the operators and users of the development.

The **Goals of this OWMP** are to

- Achieve and surpass a recycling rate of 50% of managed municipal waste in accordance with the current *Eastern-Midlands Region Waste Management Plan 2015-2021*. (Note Regional Waste Management Plans are currently under review and future publications shall be integrated into the OWMP).
- Ensure that all Clinical Waste is managed, stored and disposed of in accordance with the *Health Service Executive's Waste Management Awareness Handbook (2014)*.

The OWMP shall be integrated into the design and operation of the development to ensure the following:

- That sufficient waste management infrastructure is included in the design of the development to minimise the generation of mixed waste streams.
- That the principle of waste segregation at source is integrated into the development by the provision of separate bin systems.
- That all Non-Clinical waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.
- That all Clinical Wastes are removed from site by appropriately permitted hazardous waste contractors accompanied by a Waste Transfer Form (WTF) in accordance with the *Waste Management (Movement of Hazardous Waste) Regulations, 1998, S.I. No. 147/1998*.

2.0 WASTE MANAGEMENT GUIDANCE & POLICIES

This OWMP has been prepared with regard to the relevant waste management objectives and policies contained in Meath County Council's Development Plan 2021 - 2027 as follows:

*DM OBJ 5: Building design which minimises resource consumption, **reduces waste**, water and energy use shall be incorporated where possible in all new developments.*

INF POL 64 To encourage and support the expansion and improvement of a three-bin system (mixed dry recyclables, organic waste and residual waste) in order to increase the quantity and quality of materials collected for recycling in conjunction with relevant stakeholders.

This OWMP has been prepared with regard to the management of clinical wastes *Health Service Executive's (HSE) Waste Management Awareness Handbook (2014)*.

This OWMP has been prepared with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* which provides guidance on methods of storage, collection, segregation for recycling and recovery of wastes in non-domestic buildings.

3.0 KEY ASPECTS TO ACHIEVE WASTE RECYCLING TARGETS

The OWMP is defined by the following stages of waste management with regard to the Circular Economy and the Waste Hierarchy

Stage 1	Source Segregation
Stage 2	On-Site Deposit and Storage
Stage 3	Bulk Storage and On-Site Management
Stage 4	Off-Site Removal
Stage 5	Documented End Destination of wastes

4.0 WASTE TYPES TO BE GENERATED

Waste generated will fall into two distinct categories as follows:

4.1 Non-Clinical Wastes generated from the general operation of the Nursing Home

- Dry Recyclable Materials:
- Paper/Cardboard
- Plastics
- Glass
- Organic food waste
- Mixed non-recyclable waste

4

- Batteries
- Ink Toners
- WEEE
- Fluorescent Bulbs
- Maintenance Oils
- Food Oils
- Textiles
- Bulky Waste (Furniture)

4.2 Clinical Wastes generated by resident care

- Incontinence wear, stoma bags, urinary drainage bags,
- Dressings, Swabs, Bandages, Gloves, Sharps (needles, syringes)
- Medicines and Pharmaceuticals

The Circular Economy

Ireland's national waste policy is 'A Waste Action Plan for A Circular Economy – Ireland's National Waste Policy 2020 – 2025'. The policy, published September 2020, is intended to move Ireland toward a circular economy in which focus is shifted away from waste disposal, favouring circularity and sustainability by identifying and maximising the value of material through improved design, durability, repair and recycling. By extending the time resources are kept within the local economy, both environmental and economic benefits are foreseen.

The OWMP complies with the waste hierarchy whereby waste prevention is the most preferred strategy. Where waste generation is unavoidable, re-use is the most preferred fate, followed by recycling and then energy recovery, with disposal (e.g. to landfill) being the least preferred fate.

Figure 1 The Waste Hierarchy



5.0 WASTE SEGREGATION AT SOURCE FOR NON-CLINICAL WASTE

The Kitchen shall include a 6-bin waste system to facilitate the segregation of waste at source for

Organic compostable food waste
Plastics
Cans
Paper and Cardboard
Non-recyclable mixed waste
Glass

Figure 2 Typical Kitchen waste segregation bin system



Offices and Administration areas shall include a 7-bin waste system to facilitate the segregation of waste at source for

Organic compostable waste
Plastics
Paper and Cardboard
Cans
Non-recyclable mixed waste
Glass
WEEE

Figure 3 Typical Office waste segregation bin system



Figure 4 WEEE & Battery Recycling System



6.0 WASTE SEGREGATION AT SOURCE FOR CLINICAL WASTE

All clinical wastes shall be stored in dedicated clinical waste only storage rooms within the Nursing Home. Images of clinical waste storage bins and containers are presented in Figures 5 & 6. Further details on Clinical risk waste storage vessels are presented in Appendix I.

Figure 5 Typical Internal Clinical Waste Bin



Figure 6 Typical Internal Secure Clinical Waste Container



7.0 EXTERNAL WASTE STORAGE AREA

The external waste storage area shall be designed to include the following aspects:

- The waste storage area shall be fitted with sensor lighting.
- The waste storage area shall include ground drainage to allow for its regular cleaning and disinfection.
- The Facilities Management Company shall engage a mobile bin cleaning service provider to clean waste bins as required.
- The waste storage area shall have a separated and dedicated Clinical waste storage area containing secure weather-proof storage containers.
- The waste storage area shall contain the following 1100 litre bulk bins for the following waste streams:

7.1 Non-Clinical Waste Storage

- Green Bins for paper/cardboard/plastic/can recycling
- Grey Bins for unrecyclable mixed waste
- Brown Bins for organic food waste
- Glass Bins
- WEEE Recycling Cage
- Battery Boxes
- Fluorescent Lamp Boxes

WEEE Battery & Lamp Recycling

Waste Electrical and Electronic Equipment (WEEE) Batteries and Fluorescent Lamps shall be safely stored in dedicated WEEE recycling cages, Battery Boxes and Lamp Boxes supplied by WEEE Ireland as shown in Figures 5,6 and 7 below. These items contain precious metals, plastics and glass which can be recovered for re-use.

Figure 7 Lamp Recycling Box



Figure 8 Image of Battery Recycling Box



Figure 9 Glass Recycling Bin



Waste Oil Management & Recycling

Waste oils will be generated from plant maintenance and from food preparation in the kitchen. Oils can be processed recycled and reused by specialist waste contractors including ENVA. Maintenance and cooking oils shall be separately stored in secure containers as indicated in Figures 8 & 9.

Figure 10 Image of waste cooking oil storage containers



Figure 11 Image of waste maintenance oil storage container



7.2 Clinical Waste Storage

The external clinical waste storage area shall be designed to include the following aspects:

- All Clinical waste shall be contained in a secure, separate and segregated area within the waste storage area.
- All Clinical waste receptacles shall be stored in covered section of the waste storage area in either a secure container or bunker unit.
- Appropriate warning signs indicating the presence of healthcare risk waste/bio hazard shall be displayed at the entrance to the Clinical waste storage area
- Spill kits shall be maintained in the Clinical Waste Storage Area

Figure 12 Image of Clinical Waste Bunker

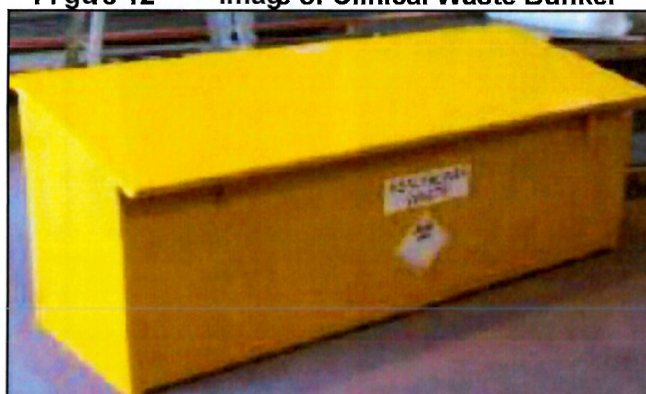


Figure 13 Image of Clinical Waste Storage Container



Figure 14 Image of Clinical Waste Yellow Wheelie Bins



8.0 GENERATED WASTE TYPES & QUANTITIES

The most recent EPA Waste statistics (2019) on household waste generation states 628kg is produced per person per year.

A value of 1.7kg of waste generated per person per day has been therefore assumed for the purposes of this report to estimate the volume of waste to be generated at the proposed fully occupied development will be c. 265Kg/day, 1855Kg/week or 11m³/week.

Table 1 Non-Clinical Waste Types per day/week

Waste Type	% Waste	Kg/week	Kg/day
Organic waste	81	0.13	81.2
Paper	33	0.15	33.2
Cardboard	10	0.04	9.5
Composites	3	0.01	2.7
Textiles	41	0.38	41.1
Plastics	36	0.90	36.1
Glass	9	0.01	9.0
Metals	8	0.09	8.2
Wood	3	0.04	3.2
Hazardous municipal waste	2	0.01	2.4
Unclassified combustibles	4	0.01	3.7
Unclassified incombustibles	3	0.01	3.2
Fines	31	0.12	31.0
Bulky Waste & WEEE	1	0.003	0.8
Totals	100	1855	265

To determine the estimated quantity of Clinical waste that will be generated, a value of 0.3Kg/resident/day has been assumed.

Table 2 Clinical Waste Types per day/week

Waste Type	Kg/day	Kg/week
Clinical Waste	47	328

9.0 WASTE STORAGE AREA DESIGN

The waste storage area shall be of sufficient size to house all Non-Clinical and Clinical waste receptacles and allow movement of waste collection vehicles.

Table 3 Nursing Home Waste Storage Area Requirements

Waste Storage Area	Minimum Bin Storage Area (m ²)
Non-Clinical Waste	35
Clinical Waste	5
Total	40

10.0 WASTE MANAGEMENT DUTIES OF THE FACILITY MANAGEMENT COMPANY

Internal & External Waste Management

The Facilities Management Company shall be responsible for the movement of all Clinical and Non-Clinical wastes from within the building to the external waste storage area and the maintenance of both internal and external waste storage areas.

Waste Management & Record Keeping

The Facilities Management Company shall maintain a weekly register detailing the quantities and breakdown of both Clinical and Non-Clinical wastes removed from the development.

Visitor Waste Management

The Facilities Management Company shall maintain 3-bin systems throughout the building, an example of which is shown below.

Image of internal 3-bin waste segregation bin system



11.0 CONCLUSIONS

The proposed Nursing Home at Moygaddy, Co. Meath shall be designed and managed to provide the operators with the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling Non-Clinical waste streams.

The management of Clinical waste will be managed, stored and transported off-site in accordance with *Health Service Executive's (HSE) Waste Management Awareness Handbook (2014)*.

APPENDIX I **Segregation & Packaging of Healthcare Risk & Non-Risk Waste**

RISK WASTE		
YELLOW BAG	YELLOW SHARPS BIN (with blue or red lid)	YELLOW 30/60 LITRE RIGID BIN (with yellow lid)
 • All blood-stained items and all items soiled with body fluids assessed as infectious • Suction catheters & tubing • Incontinence waste from known or suspected enteric infections * NO SHARPS OR FREE LIQUIDS	 • Needles, Syringes & Scalpels • Contaminated slides & glass • Sharps tips of clear IV giving sets • Blood stained glass • Stitch cutters • Guide wires/trocars • Razors * NO FREE LIQUIDS	 • Blood administration sets (never disconnect line from bag) • Contained blood and body fluids • Non-cultured laboratory waste (including autoclaved microbiological cultures) • Disposable suction liners • Redivac drains (ensure drain closure sealed) • Sputum containers • Chest drains * NO SHARPS OR FREE LIQUIDS

RISK WASTE		
YELLOW 30/60 LITRE RIGID BIN (with purple lid)		• Cytotoxic drugs including infusion lines, left over drug preparations and personal protective equipment used. • Small quantities of residual medicines or pharmaceuticals left over after administration to patients. * NO SHARPS OR FREE LIQUIDS
YELLOW SHARPS BIN (with purple lid)		• Contaminated cytotoxic sharps, needles, syringes, sharp instruments and broken glass * NO FREE LIQUIDS
YELLOW RIGID BIN (with black lid)		• Non-autoclaved microbiological cultures • Large / recognisable anatomical body parts • Placentas with additional leak proof containment • Large solid metal objects and instruments * NO SHARPS OR FREE LIQUIDS

NON-RISK WASTE

CLEAR BAG



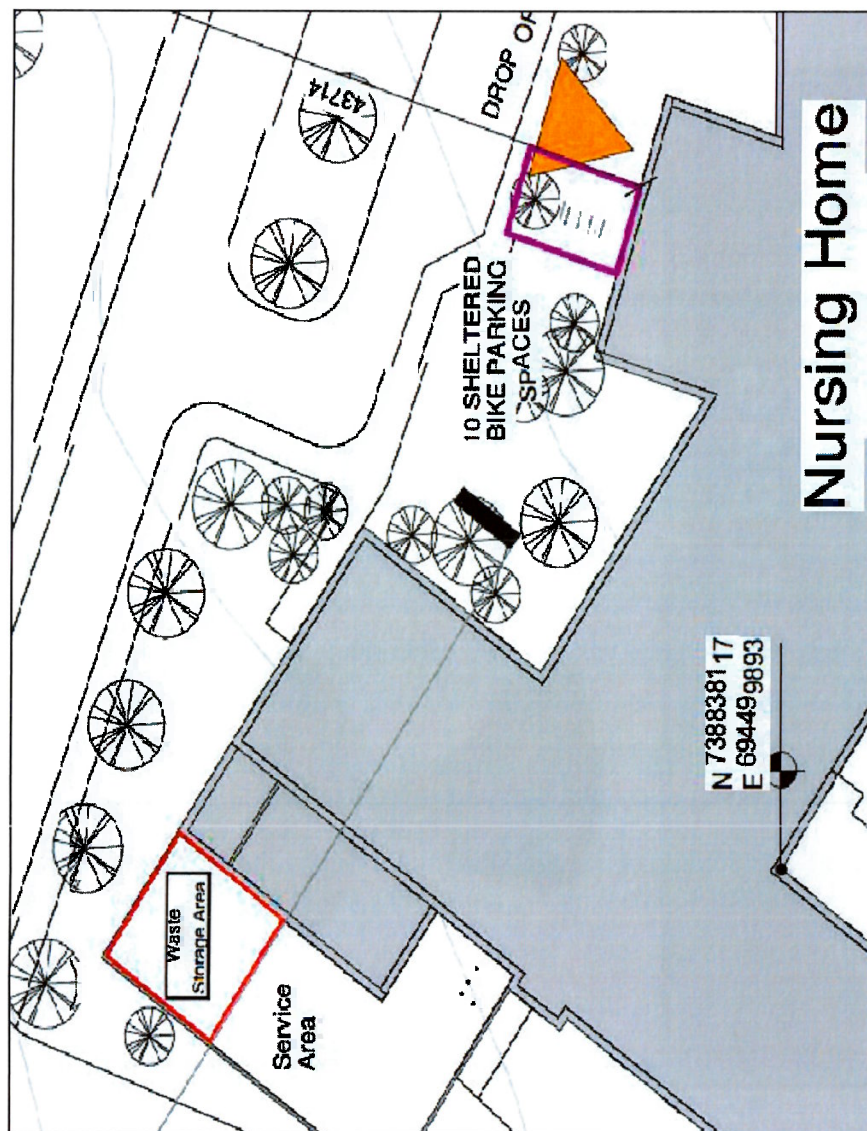
- Incontinence wear (from non-infectious patients)
- Oxygen face masks
- Empty urinary drainage and empty stoma drainage bags
- Clear tubing (e.g. oxygen, urinary catheters, ventilator, naso gastric, IV lines with tips removed)
- Enteral feeding equipment
- Non contaminated gloves, aprons and masks
- Empty continuous ambulatory peritoneal dialysis (CAPD) bags

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Operational Waste Management Plan

APPENDIX II

Location of Waste Storage Area





APPENDIX 4-6

BRIDGE OPTIONS REPORTS

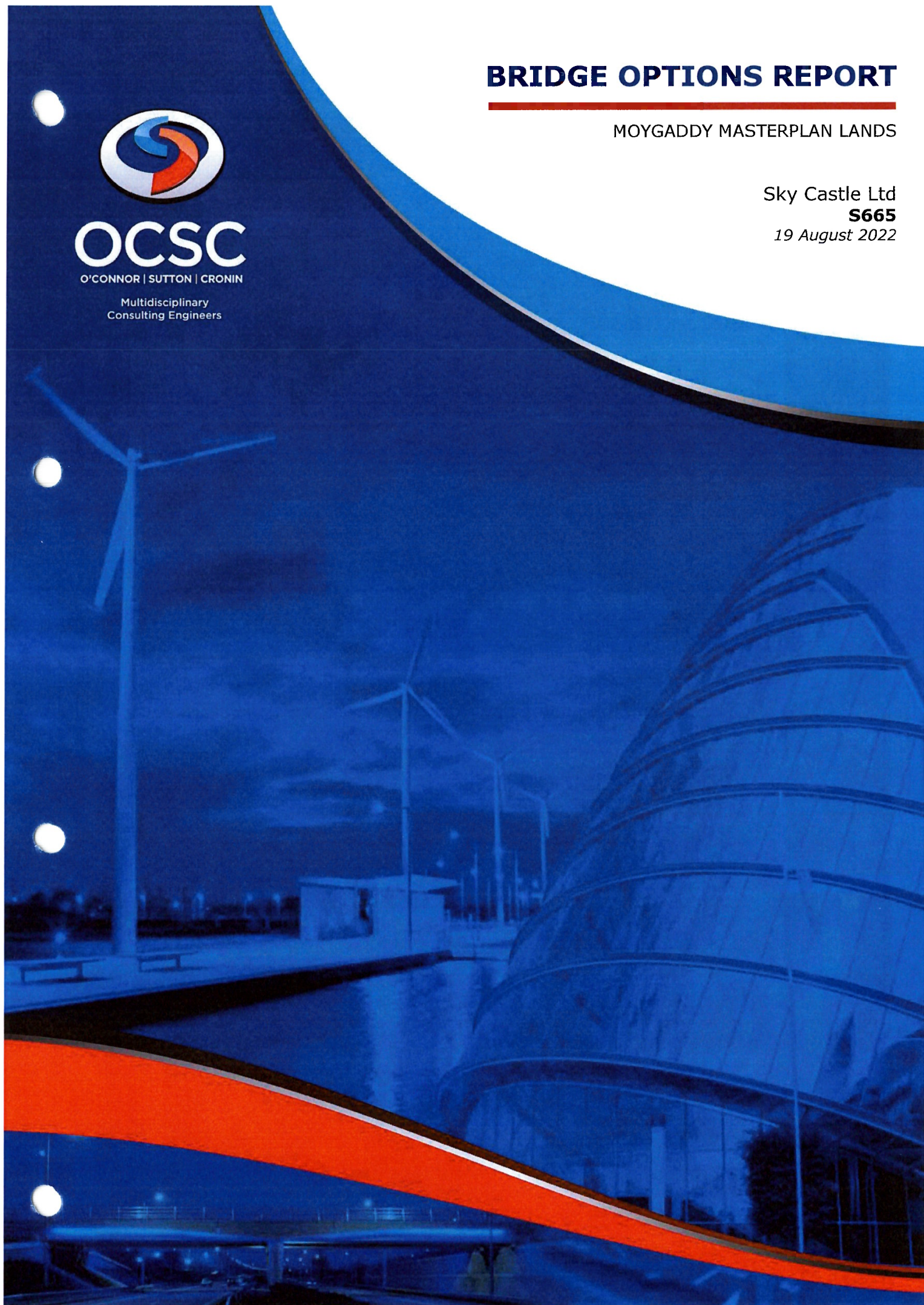


BRIDGE OPTIONS REPORT

MOYGADDY MASTERPLAN LANDS

Sky Castle Ltd
S665

19 August 2022



BRIDGE OPTIONS REPORT

Moygaddy Masterplan Lands

Sky Castle Ltd

S665

19 August 2022

BRIDGE OPTIONS REPORT

MOYGADDY MASTERPLAN LANDS



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1 INTRODUCTION

APPOINTMENT

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by Sky Castle Ltd to carry out the design of the civil engineering services associated with the development of the proposed Maynooth Outer Orbital Road (MOOR) on lands at Moygaddy, Co. Meath, which is located northeast of the town of Maynooth, Co. Kildare.

SETTING

Maynooth environs is a large growth area, category II Town status located in south County Meath, and is an economically vibrant area with high-quality transport links to larger towns/cities. The Meath Development Plan 2021-2027 outlines the social, economic, and planning context for the Maynooth environ lands, setting the framework for the plan's policies and objectives. It has a core strategic vision that seeks to ensure that future growth is based on principles of sustainable development that meet the needs of residents per National and Regional guidelines. The environs of Maynooth is a Core Economic Area included in the Gateway Core Economic Area located on the M4 corridor. The wider Maynooth Environs Lands proposed land-use zoning includes A2 – New Residential, E1 – Strategic Employment Zones, G1 – Community Infrastructure, D1 – Tourism and H1 – High Amenity.

The delivery of the Maynooth Outer Orbital Route (MOOR) is critical to facilitating residential, high-end employment, tourist, and leisure development in the Maynooth environ lands and fulfilling the transport infrastructure needs in proximity to Maynooth University and Maynooth town.

ADMINISTRATIVE JURISDICTION

The proposed development is located primarily in the jurisdiction of Meath County Council (MCC), and therefore the Maynooth Outer Orbital Route design and the associated civil engineering services were carried out with reference to the following:

- Meath County Development Plan 2021-2027;
- Maynooth Environs Local Area Plan 2014 (incorporated into adopted MCDP);
- Regional Spatial and Economic Strategy for the Eastern and Midland Region (2019);

Even though Maynooth Environs is situated in the Meath County Council administrative area, the Maynooth Environs Local Area Plan contains an objective to liaise with Kildare County Council in the identification, design, reservation and delivery of the section of the Maynooth Outer Relief Road located within the administrative area of Meath County Council. The administrative area of Kildare County Council is located immediately adjacent to the LAP environs lands and some infrastructure improvements will be located within the Kildare County Council (KCC) administrative area. Therefore, the design will also be conducted with due regard to:

- Maynooth LAP
- Kildare County Development Plan
- Maynooth Traffic Management Plan

STUDY AREA

The subject site is located on the southernmost extent of County Meath, as shown in Figure 1, aligning with the county boundary to Co. Kildare. It is approximately 1.5km north of the town of Maynooth, Co. Kildare, which forms part of a larger strategic landbank on zoned lands known as Maynooth Environs. The site is immediately bound by:

- R157 Maynooth – Dunboyne Road, to the east;

- Agricultural lands, to the north and west; and
- River Rye Water, to the south;

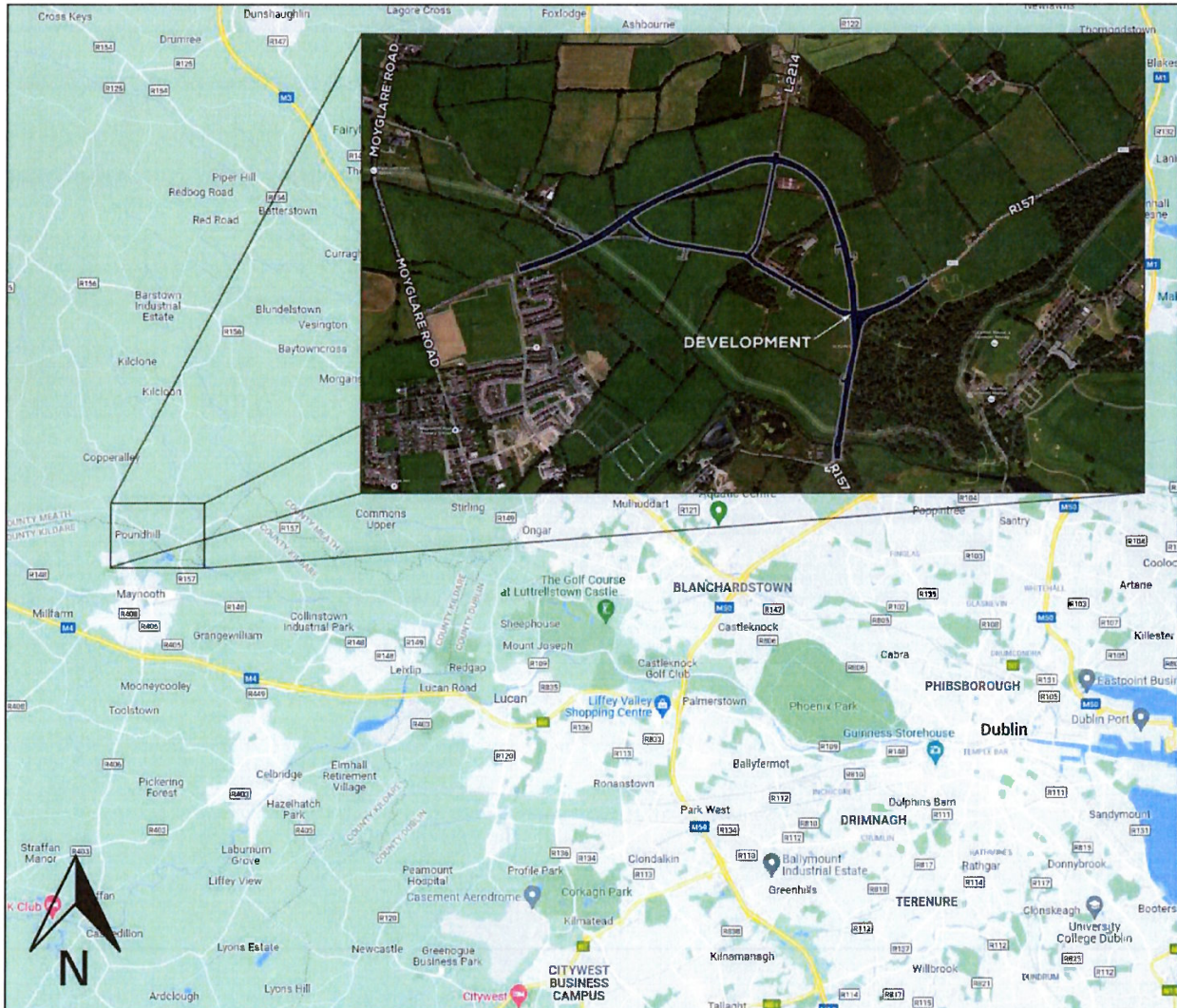


Figure 1: Development Locality Plan

BRIDGE STRUCTURES

There are five bridge structures required within the project's extent. Two bridge structures carry a regional road and a shared pedestrian/cyclist laneway, and three structures carry a shared pedestrian/cyclist laneway only. These are referred to as 'road' bridges and 'pedestrian' bridges for the remainder of the report. All bridge structures will be built to facilitate the phased development. This Options Report has been prepared per TII standard DN-STR-03001 Appendix B.

2 DESCRIPTION OF STRUCTURES AND OPTIONS CONSIDERED

SITE LOCATION

The proposed development is bounded by the River Ryewater to the south, and farmland to the north. A Site-Specific Flood Risk Assessment has determined that the development is located without a flood zone. Refer to the separate SSFRA OCSC report, S665-OCSC-1C-XX-RP-C-0009, and JBA Consulting's Flood Risk Assessment report on the Moygaddy Masterplan for details. The conclusions in these reports have been considered in the road alignment and hence, the geometry and type of bridge structures.

Refer to the figure below for the location of Applicant-owned lands, in the Maynooth Environs area, in which the new bridge structures are to be provided, along with local watercourses. A total of 5nr. bridge structures are to be provided through the Maynooth Environs area, to facilitate the provision of the new Maynooth Outer Orbital Route (MOOR) and improvements to pedestrian and cycle connectivity throughout.



Figure 2: Site Location and Local Watercourses

BRIDGE STRUCTURES

A total of 5 nr. bridge structures are to be provided through the Maynooth Environs area, to facilitate the provision of the new Maynooth Outer Orbital Route (MOOR) and improvements to pedestrian and cycle connectivity throughout.

Refer to the figure below for the location of the proposed bridge structures.

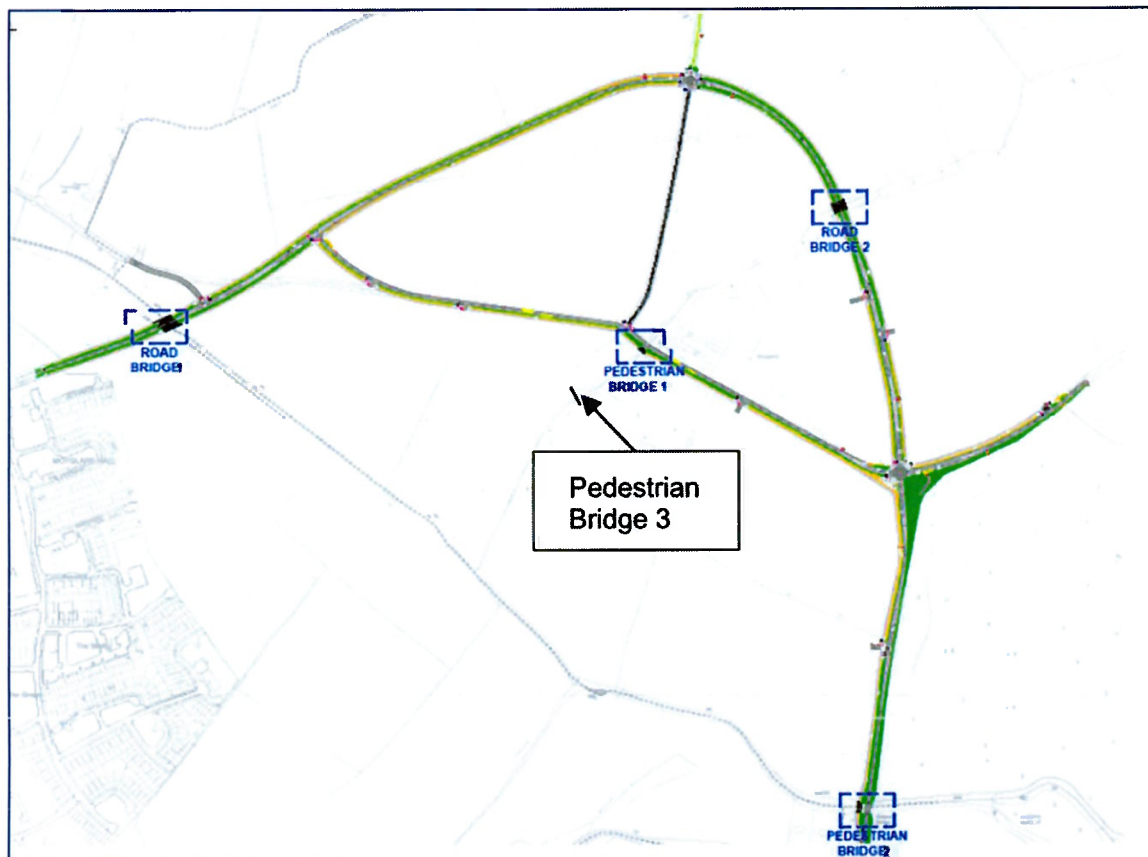


Figure 3: Location of Bridges

The noted bridges are summarised as follows:

ROAD BRIDGE 1

This is to comprise a 50m span across the River Rye Water, and link west Maynooth to the proposed new MOOR, which shall include pedestrian and cycle facilities and extension of water main assets to serve new development in Maynooth Environs. The elevation and cross-section of this bridge is shown in the figure below.

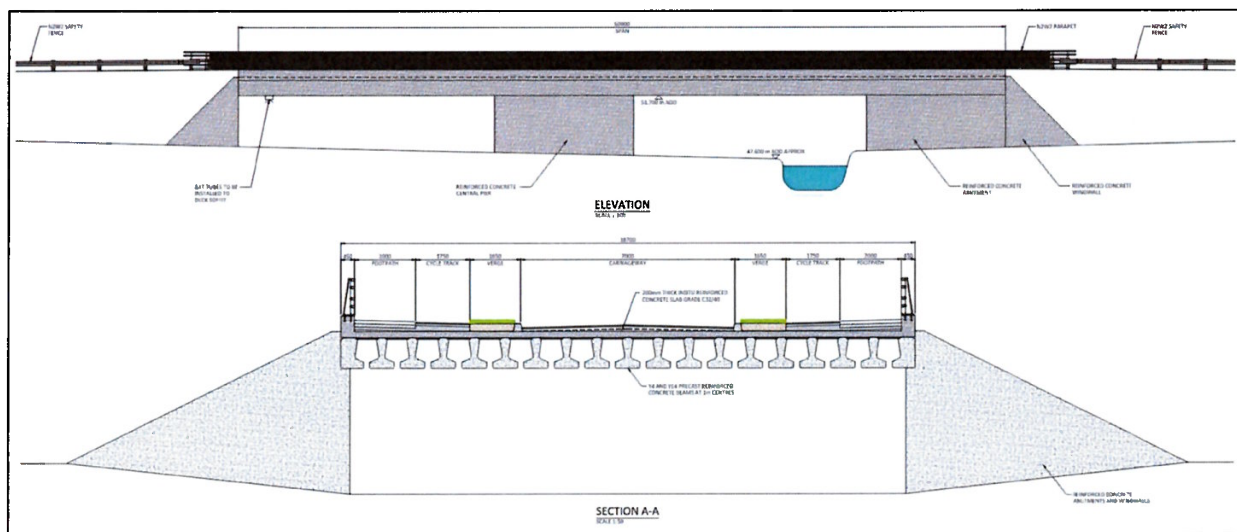
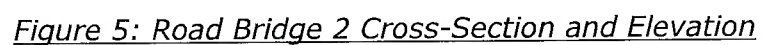


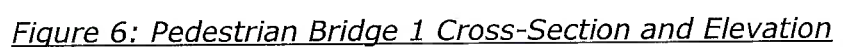
Figure 4: Road Bridge 1 Cross-Section and Elevation

ROAD BRIDGE 2

This is to comprise a short-span vehicular bridge, as part of the new MOOR, including pedestrian and cycle facilities. The elevation and cross-section of this bridge is shown in the figure below.



This is a new pedestrian and cycle bridge structure that will be erected adjacent to the downstream side of the existing vehicular bridge at this location, which spans the Blackhall Little stream (also known as the Moygaddy Stream). It is to be a standalone, independent structure. The elevation and cross-section of this bridge is shown in the figure below.



PEDESTRIAN BRIDGE 2

This is a new pedestrian and cycle bridge structure that will be erected adjacent to the upstream/western side of the existing Kildare Bridge at this location and is to be a standalone, independent structure, that shall also support new water main assets. New wastewater rising mains shall also be installed underground, adjacent to this bridge structure, to its west. The elevation and cross-section of this bridge is shown in the figure below.

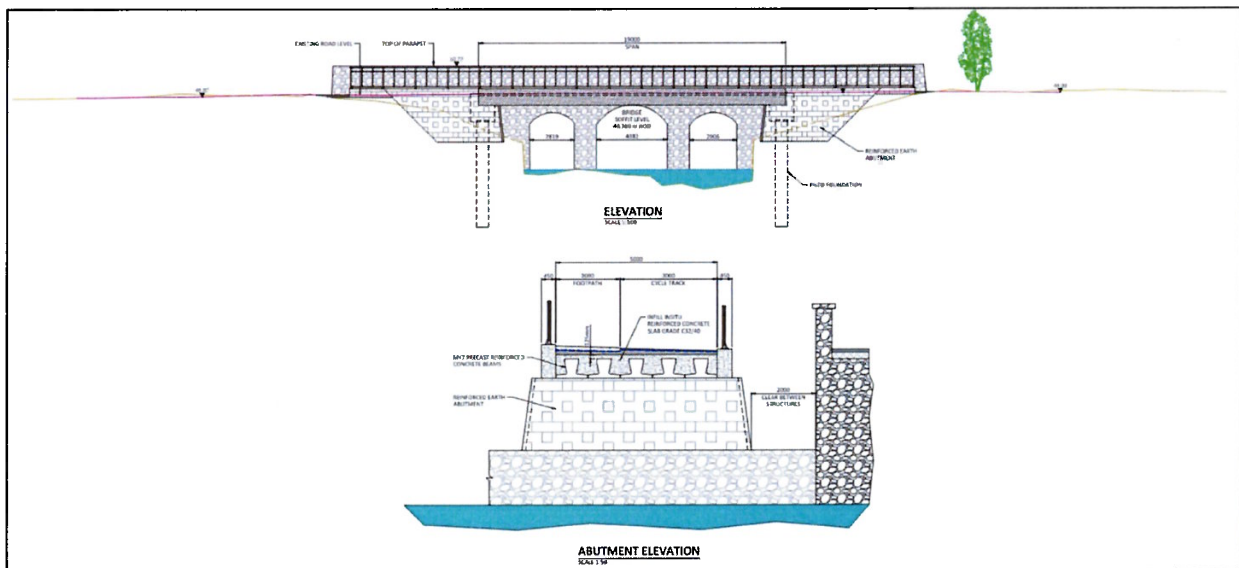


Figure 7: Pedestrian Bridge 2 Cross-Section and Elevation

PEDESTRIAN BRIDGE 3

A new pedestrian and cycle bridge structure is to be provided as part of the Strategic Housing Development scheme, over the Blackhall Little / Moygaddy Stream, linking the residential units with the proposed scout's den and creche. The new bridge structure will also support a gravity wastewater pipe, to facilitate a connection over to the location of the proposed strategic wastewater pumping station. The elevation and cross-section of this bridge will be similar to Pedestrian Bridge 1, shown in Figure 6.

FUNCTION OF THE STRUCTURES

The function of the structures is to carry motorists, pedestrians and cyclists over the two watercourses, the River Rye and the Modgaddy stream, that dissect the proposed development. The structures are to have little or no impact on the adjacent flood plain and properties. A freeboard of 600mm between the design flood level and the minimum bridge soffit level has been adopted. The location of bridge supports will be located outside of the flood plain where practically possible. The purpose of this report is to discuss the various options of structural form to minimise the impact on the surrounding environs.

ALIGNMENTS AND CROSS-SECTIONS

The vertical and horizontal alignments are designed by OCSC. They are in accordance with TII standard DN-GEO-03031 Rural Road Link Design. A design speed of 60 kph is adopted for the development. The road bridge design consists of a 7m wide single carriageway with a hard paved verge, footpath and cycle track. The pedestrian bridges are 5m wide between parapets and have a 2m wide footpath and a 3m wide cycle track.

GROUND CONDITIONS

A number of percussion boreholes, rotary cores, dynamic probes and trial pits have been undertaken on the site. The existing ground strata consist of a brown overlaying a black sandy gravelly clay which is consistent in the Leinster region. Occasional cobbles are present in the clay, which is limestone in origin. The underlying bedrock consists of strong limestone interbedded with strong calcareous mudstone.

STRUCTURE OPTIONS

Three options have been explored for the development:

1. In-situ reinforced concrete bridge deck.

2. Precast reinforced concrete bridge deck.
3. Composite steel girder and in-situ bridge deck.

All options are integral in their abutments to minimise future maintenance requirements and adhere to the TII standards. The abutments are formed of reinforced concrete which sits on bored concrete piles in all instances.

The evaluation of the options considered in the remainder of this report relates to the road bridges only. The pedestrian bridge options are identical in nature but have a narrower bridge deck. i.e the options for the pedestrian bridge deck construction are in-situ reinforced concrete, precast beams and an in-situ deck, and a steel girder with an in-situ deck. The evaluation of the options and the recommendation in the following chapters are applicable to both road bridges and pedestrian bridges.

3 TECHNICAL EVALUATION

OPTION 1 – IN-SITU REINFORCED CONCRETE BRIDGE DECK

A reinforced concrete bridge deck continuous over pier supports (where applicable) and integral at the abutment bank seats and a voided deck. For a span length of 25m, the depth of the deck is approximated at 1.25m.

The technical advantages of this option are:

- The supports are outside the width of the flood plain, eliminating the risk of scouring and an effect on the existing hydrology.
- Integral construction removes the need for bearings and expansion joints at deck level.
- Concrete will require minimal future maintenance over the river.
- The geometry of the structure on plan and elevation is easily manipulated

The technical disadvantages of this option are:

- The construction of in-situ concrete options required significant falsework and formwork over the river.
- There is a significant time required in steel fixing, with less quality control than is typically available for precast construction, leading to long-term durability and maintenance issues.
- There are multiple pours required leading to cold-formed joints and potential water ingress locations at small void locations.

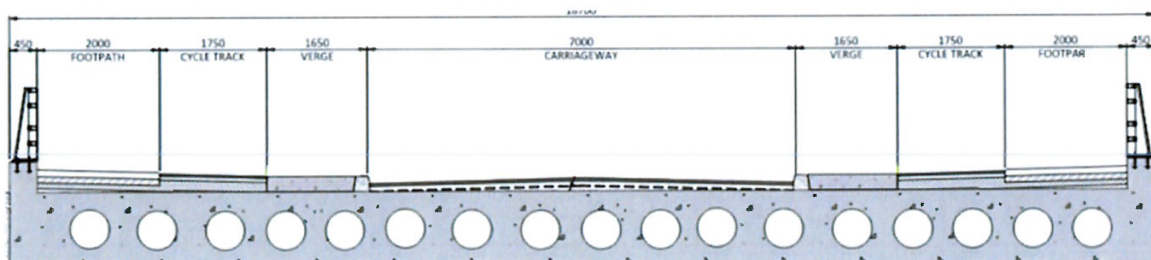


Figure 8: Reinforced Concrete In-situ Deck

OPTION 2 – PRECAST REINFORCED CONCRETE BRIDGE AND IN-SITU DECK

A precast concrete bridge deck is simply supported at abutment and pier locations with an in-situ deck. All structures are integral at the abutment bank seats. For a span length of 25m, the depth of the deck is approximated at 1.20m.

The technical advantages of this option are:

- The supports are outside the width of the flood plain, eliminating the risk of scouring and an effect on the existing hydrology.
- Integral construction removes the need for bearings and expansion joints at deck level.
- Concrete will require minimal future maintenance over the river.
- Falsework and formwork are largely reduced in comparison to an in-situ option.
- Quality control is factory controlled.
- Steel fixing and shuttering on-site are significantly reduced, as are the hazards and risks associated with the works, and construction over a watercourse.
- The available span lengths for precast products will suffice for all bridge structures, bringing the economy to the scheme from repetition.

The technical disadvantages of this option are:

- The single-span option is not as efficient as the two-span option of Option 1 (Applicable at 1no. structure only)
- The heavy lifting of prefabricated elements

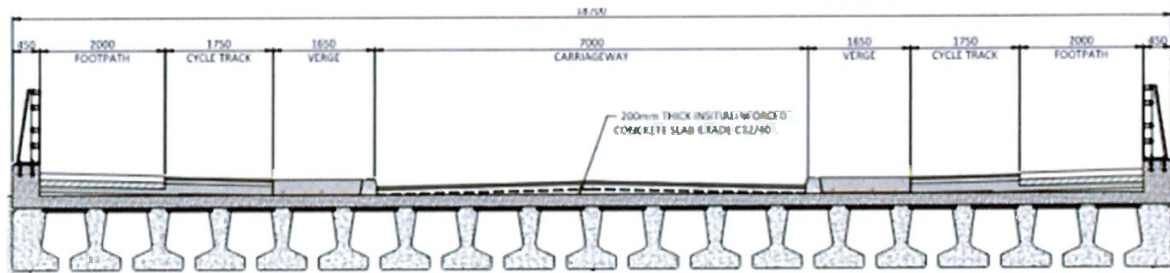


Figure 9: Precast Beams and In-situ Deck

OPTION 3 – COMPOSITE STEEL GIRDER AND IN-SITU DECK

A steel girder bridge beam arrangement with an in-situ deck. All structures are to be integral at the bridge abutments. The bridge is continuous over the pier supports where applicable (1no. road bridge structure) The overall depth of the girder and RC deck is approximately 1.2m, 1.0m girder depth and 200mm RC deck.

The technical advantages of this option are:

- The supports are outside the width of the flood plain, eliminating the risk of scouring and an effect on the existing hydrology.
- Integral construction removes the need for bearings and expansion joints at deck level.
- The structure is lightweight in comparison with a concrete alternative.
- The girders are fabricated and assembled off-site.
-

The technical disadvantages of this option are:

- Maintenance - The steel girders will require a paint protection system which will need to be maintained over a period of 120 years, in an area of difficult access over a watercourse.
- The economy is achieved with spans in the vicinity of 25-45m, as opposed to the 15-25m spans required for this development.

- Structural steel availability is low with a large lead in times due to import requirements. Concrete and reinforcement are locally and readily available.

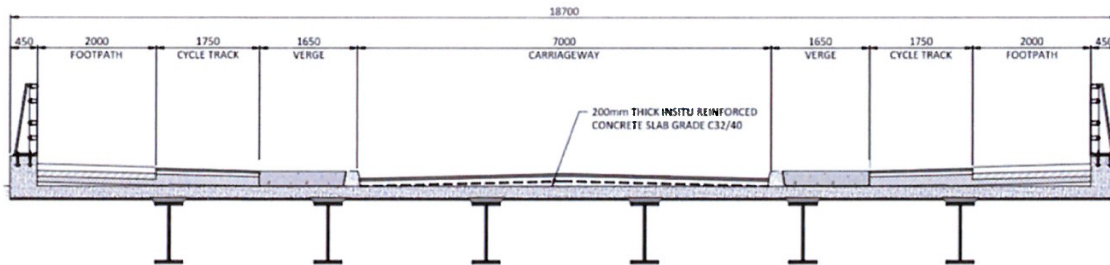


Figure 10: Composite Steel Girder and In-situ Deck

4 ECONOMIC EVALUATION

At this early stage in the project, it is difficult to calculate a precise value for each structural option, particularly with the inflation in construction products witnessed in recent years. As all substructure is the same for all options, the costs below are based upon the superstructure bridge deck only. The figures below are based on Road Bridge 1, which consists of a two-span deck totalling 50m in length, and 18.7m in width.

OPTION 1 – IN-SITU REINFORCED CONCRETE BRIDGE DECK

The in-situ deck will require falsework in the floodplain/watercourse, steel fixing and shuttering. The supports remain consistent across all options. The rate used to calculate the deck construction is €1200 / m². Note, that the rate includes costs for falsework, reinforcement, concrete, pavement installation, waterproofing, and parapet install. The total cost is 50m x 18.7m x 1200 = **€1,122,000**

OPTION 2 – PRECAST REINFORCED CONCRETE BRIDGE AND IN-SITU DECK

The precast beams will be manufactured and lifted on-site. The in-situ deck will be constructed on top of the permanent shuttering planks, eliminating any falsework in the watercourse. The current rate for the precast beams is €450 per metre. The number of beams per span is 18no. The rate used to calculate the deck construction is €625 / m². Note, that the rate includes costs for lifting operations, reinforcement, concrete, pavement installation, waterproofing, and parapet install.

Construction Cost: Precast Beams = 18no. x 2no. spans x 25m per beam x €450 =
€405,000
Deck Construction = 50m x 18.7m x 625 = €584,375
Total Cost = **€989,375**

OPTION 3 – COMPOSITE STEEL GIRDER AND IN-SITU DECK

The steel girder option requires a paint protection system to be applied to the beams prior to site installation. The rate for structural steel supply including the paint protection system is €3000 per tonne. The cross-sectional area per girder is 0.06m² allowing 10% for connections. There are 6no. girders are required to take the deck cross-section. Note, that the cost does not include future maintenance requirements.

Construction Cost: Steel Girders = 6no. x 2no. spans x 25m per beam x €3000/tonne
x 7.85 t/m³ x 0.06 m²/girder = €423,900
Deck construction (as before) = €584,375
Total Cost = **€1,008,275**

The land take requirement and substructure are the same for all three options. Option 2 is the cheapest option and has very low future maintenance costs. The cost of falsework and reinforcement tonnage contribute significantly to the total construction cost of Option 1, making it the most expensive option. Although Option 3 is not much more expensive than Option 1, the future maintenance costs over the design life of the steel girder option are viewed as a substantial additional cost, ranging in the hundreds of thousands.

5 AESTHETIC EVALUATION

The aesthetics of the bridge structures is an important aspect to consider. The scale and diversity of the development will create various viewing angles for all structures. However, a balance is required between function, value, constructability, and aesthetics. Due to the traditional structural nature of each bridge option, the aesthetics will be inherently similar i.e. a beam and slab solution. The optimisation of the aesthetic between the three options is achieved by reducing structural depth, creating a slim, clean line visual for the viewer and reducing the impact on its surroundings. Another consideration is the view of the structure for the road user, pedestrian and cyclist, so pavement type and parapet aesthetic are important considerations.

OPTION 1 – IN-SITU REINFORCED CONCRETE BRIDGE DECK

The in-situ deck is estimated as 1.25m in depth, while this is only fractionally deeper than the alternatives, it will have the greatest impact on the surroundings. There is an option to create a cantilevered narrow edge than can support the footway and parapet on the road bridges, however, this is difficult to form, shutter and steel-fix over a watercourse.

OPTION 2 – PRECAST REINFORCED CONCRETE BRIDGE AND IN-SITU DECK

The precast beam option is 1.2m in depth. There is an option to precast an edge beam with a curved or tapering soffit which can create a shadow effect which appears to make the deck shallower to the eye. Forming the edge beam is a controlled factory process and it can easily be dropped into position and tied in with the in-situ deck pour. Various options can be considered at tender and detailed design stages.

OPTION 3 – COMPOSITE STEEL GIRDER AND IN-SITU DECK

The composite steel and in-situ deck will be 1.2m deep. The cantilevered deck is a natural visual line for a narrow element, creating the least impact on the surrounding area. Over the lifetime of the structure, significant maintenance will be required for the steelwork, unless this is undertaken in a timely manner, any paint flaking or corrosion pitting can become a detrimental aesthetic.

6 MAINTENANCE REQUIREMENT EVALUATION

The maintenance requirements for a bridge structure can be the largest cost over its design life if not fully considered in the concept. They can largely outweigh the initial construction cost if not 'designed out' effectively, and in instances, lead to the requirement of a complete structural replacement. The key items to consider in the maintenance of a bridge are materials, bearings, joints, and workmanship. The three options proposed are integral structures, hence, bearings and expansion joints have been designed out of any future maintenance requirements. Resurfacing and waterproofing of the RC deck are common to all three options, so they are not further considerations.

OPTION 1 – IN-SITU REINFORCED CONCRETE BRIDGE DECK

The maintenance costs for the in-situ option will be low. The risk with the in-situ pour is in the quality of workmanship and cover to reinforcement. Any areas that do not achieve the required cover, due to lower quality control associated with on-site works, may be subject to reinforcement corrosion and concrete spalling over time.

OPTION 2 – PRECAST REINFORCED CONCRETE BRIDGE AND IN-SITU DECK

The precast option has the least maintenance costs if any. The quality control of the reinforcement and tendon fixing for the precast beams will reduce the risk of corrosion and spalling in the future. The high grade of concrete strength, typically C50/60 will also increase the resistance to penetrating chlorides, carbonation and freeze-thaw attack.

OPTION 3 – COMPOSITE STEEL GIRDER AND IN-SITU DECK

The composite steel and in-situ deck will require a maintenance schedule for the girders. The paint system is likely to require a full refurbishment after approx. 25 years. This will be a substantial cost in the design life of the structure requiring access and encapsulation over the watercourse.

7 FURTHER CONSIDERATIONS

HYDRAULIC CONSIDERATION

A flood study has been undertaken for the entire scheme. The flood plains have been considered in the calculation of the bridge spans, flood levels and clear heights to the bridge soffit, which remains constant for all three options. For this report, the hydraulic criteria do not impact the three options considered.

HEALTH AND SAFETY CONSIDERATIONS

Other than standard construction-related health & safety issues, the primary health and safety concern with the construction of this bridge is working adjacent to and over a river.

Option 1, the in-situ deck, requires considerable falsework over the watercourse. Shuttering, fixing and casting the deck will be time-consuming and labour intensive, giving a high potential for incidents.

Option 2, the precast concrete beam option, requires the lifting of heavy precast elements. However, once the main beams are in position, precast panels are laid across the beams from a safe working platform for the in-situ works, which are considerably less intense than Option 1 with regard to reinforcement size and quantity. The prefabrication of the precast beams reduces the time for construction on site, which is a significant reduction of risk for the scheme.

Option 3, the steel girder and in-situ deck offer similar health and safety benefits as Option 2. There is slightly more time and consideration in the cantilevered deck edge which is likely to be cast in situ, hence falsework supported off the main beams is required. However, a proprietary product may be available to attach to the main girder prior to lifting in, or perhaps the cantilevered deck may be offered as precast, both can be considered at the detailed design stage.

CONSTRUCTION AND BUILDABILITY

The construction and buildability of a bridge over a river are critical considerations. The use of precast beams in Option 2 and the prefabricated steel members in Option 3 give them a distinct advantage over Option 1, which requires falsework over the river to carry out the in-situ construction.

While Options 2 and 3 do not require falsework over the river, they do require significant transport and crane operations to install the heavy precast/prefabricated elements. There is very good access to the development from the eastern side via N4 and regional roads from Leixlip and Maynooth.

Option 1, while of relative standard construction has some complex falsework requirements over the river. There will also be restrictions on the time of year that construction can take place due to fisheries and flood considerations. Option 2 is a standard form of construction which has been commonly used in Ireland in recent decades and as such would be the most straightforward from a buildability perspective. Similarly, Option 3 is a simple form of construction, but consideration has to be given to forming the deck, which is not as straightforward as Option 2 as previously described.

GROUND CONDITIONS

The ground strata are formed of topsoil underlaid by clay. The brown/black clay varies in stiffness with depth and can be described as typical conditions across the North Leinster region. Beneath the clay a very strong limestone bedrock is present. As all bridge options are integral piled solutions that extend to bedrock, the ground conditions do not affect the three options presented.

8 RECOMMENDATION

In addition to whole-life costs, the most critical technical considerations in evaluating the options proposed for these bridges are:

- Construction over a watercourse
- Maintenance considerations

Option 1 has the highest cost and most complex construction requirements. There is higher health and safety, constructability and environmental risk associated with the in-situ works over a watercourse. There are greater time and labour requirements for the workforce on-site. The maintenance costs and aesthetics are similar for both concrete options.

Option 2 has the lowest cost and maintenance requirements and simplest construction requirements. The aesthetics can be altered via a precast edge beam at the detailed design stage if required. The health and safety and constructability aspects of the proposal are advantageous over all the other options. There are economic benefits from repetition in the prefabrication of standardised precast beams for all bridge locations across the development. Alternative solutions such as girders will vary in plate thicknesses and depths, while in-situ decks will require differing reinforcement sizes and additional design and construction timeframes.

Option 3, while construction cost is competitive with the other options, has a large cost implication due to future maintenance requirements. The construction sequence is relatively simple and there are reduced health and safety risks due to prefabrication off-site. The narrow deck profile will give the impression of a 'light' design in comparison to a concrete alternative.

Based on the points above, Option 2 appears to offer the best solution for the bridge structures required within this development.

9 VERIFICATION

This report was compiled and verified by:

Gavin Mullins
Structural Engineer
O'Connor Sutton Cronin & Associates





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APPENDIX 4-7
LANDSCAPE MASTERPLAN



Primary Care Centre & Nursing Home at Moygaddy, Maynooth, Co. Meath

LANDSCAPE RATIONALE

Ronan Mac Diarmada & Associates

Landscape Architects & Consultants

August 2022



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SITE CONTEXT



Site Context

Location

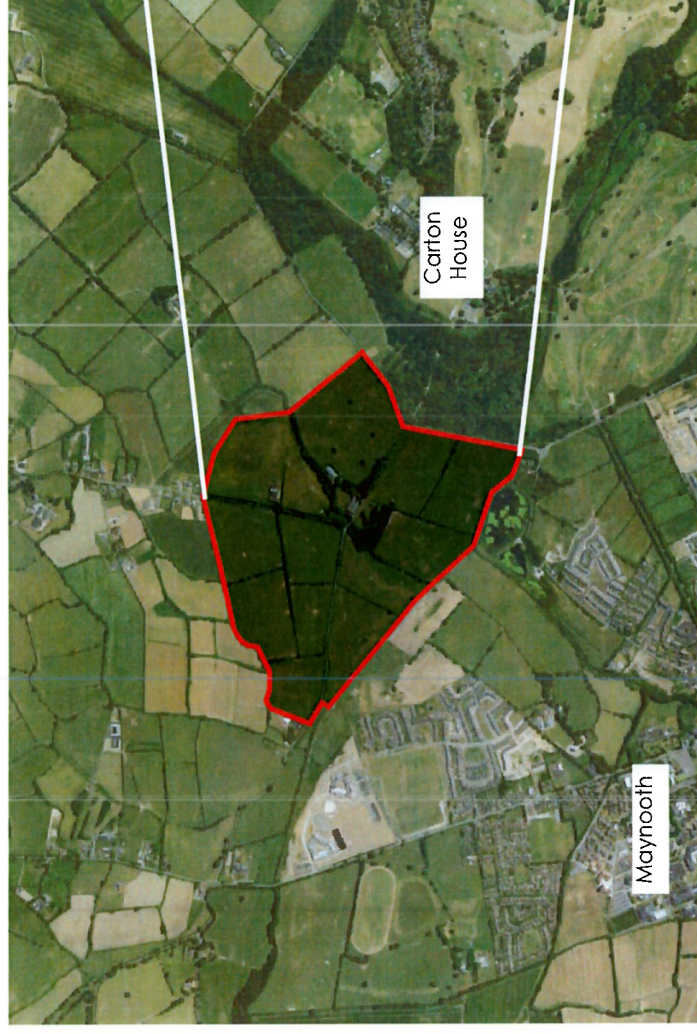


Figure 1

 Moygaddy Future Development

The proposed development lands are situated in Moygaddy (Maigh Gadaí), County Meath, just north of Maynooth. The Applicant controls a land bank of circa 240 Acres, as shown in Figure 1, which is earmarked for major infrastructure upgrades and future mixed use development.

The largely greenfield site is bordered by mature trees and hedgerows, with many scenic vantage points which offer elevated views south to Maynooth and the surrounding hinterland. The location of proposed Primary Care Centre & Nursing Home Development, which is the subject of this application is shown in Figure 2.

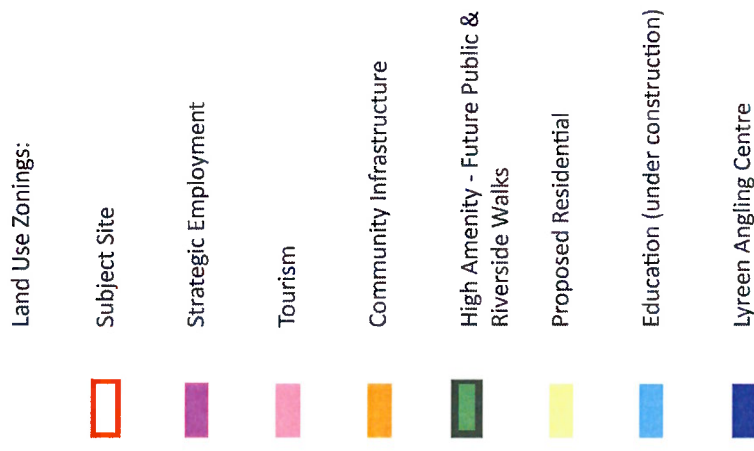


Figure 2

 Proposed Site Location

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.





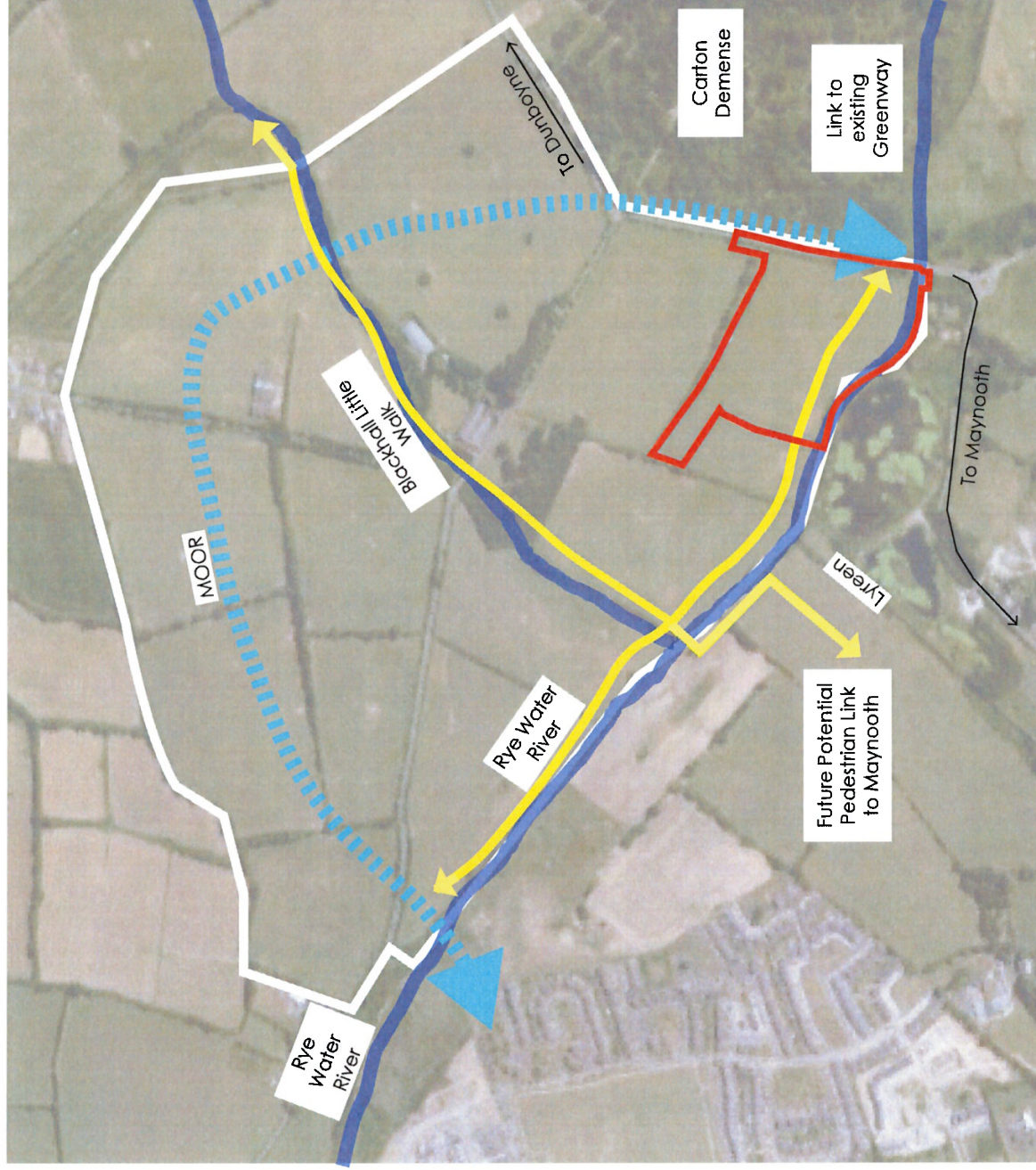
Masterplan Phasing



- Community Infrastructure Zone
- Residential
- Strategic Employment Zone
- Tourism Zone
- High Amenity Area



Development Connectivity Context



Yellow line: Riverside Walk

Blue line: New Road Access / MOOR

Connectivity

A key objective of the design brief is to reduce car dependency by providing high quality pedestrian and cycle networks. The provision of green infrastructure and walking and cycle trails will integrate the new development into the existing landscape.

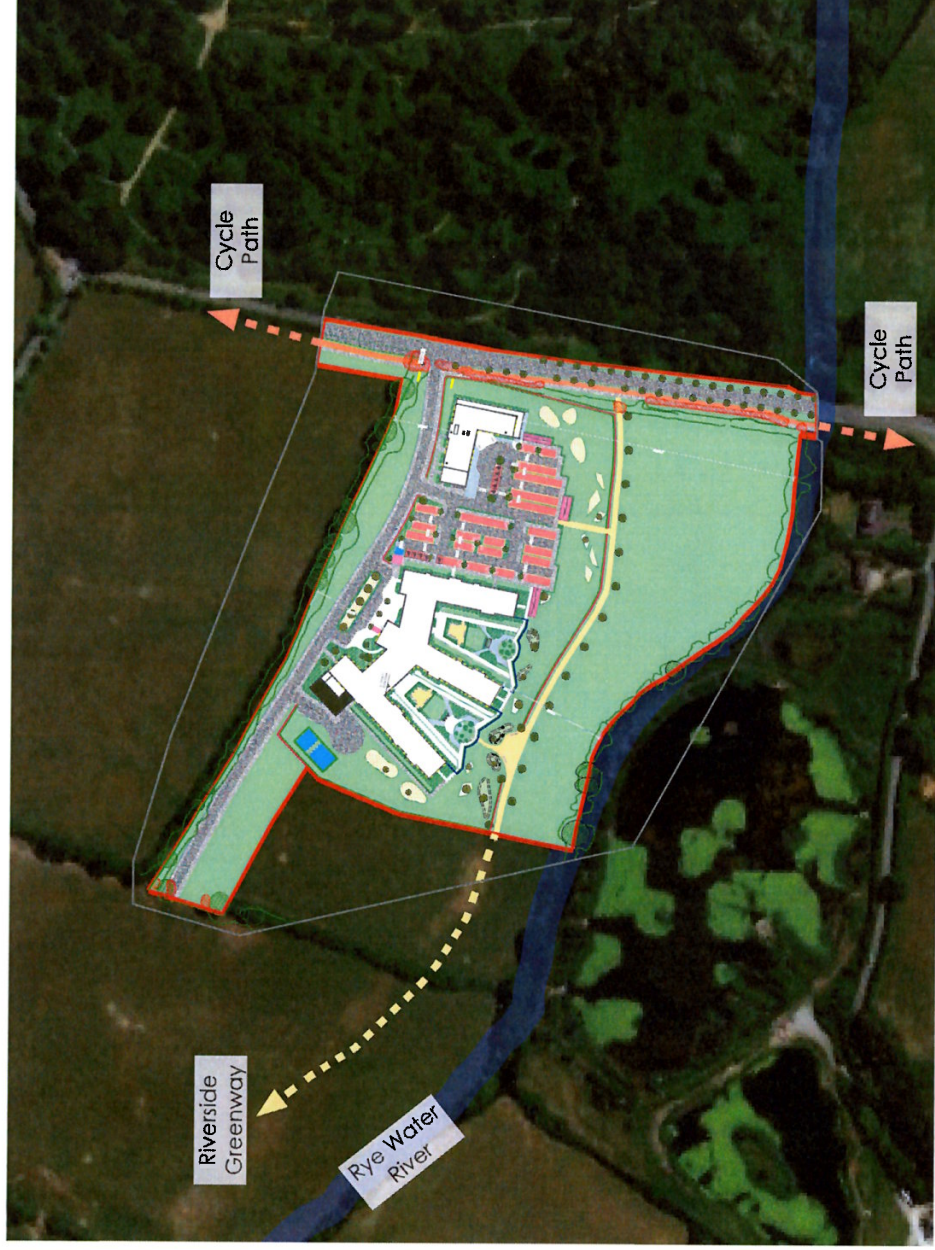
The design brief is to promote permeability throughout the entire masterplan area to facilitate the phased delivery of direct pedestrian and cycle linkages with the town of Maynooth and surrounding amenities.

As part of the wider masterplan, this Primary Care Centre & Nursing Home Development proposal will deliver a section of the Rye Water River Walk which will ultimately be linked to the future residential phases of the masterplan, located to the west. The Rye Water River Walk will be delivered in an integrated and phased manner.



DESIGN PROPOSAL





This Landscape proposal for the Primary Care Centre and Nursing Home is an integral subset of the landscape strategy for the wider masterplan for the entire Moygaddy landbank.

The proposal strives to create a unique landscape identity, which will provide a positive quality of life for resident, visitors, and staff at the proposed Primary Care Centre and Nursing Home.

The landscape proposals primary aim is to make a positive contribution to the physical and psychological needs of the patients and staff at the new community healthcare facilities. An abundance of foliage, textures, blooms, and trees are proposed to help stimulate the senses and to promote therapeutic benefits, creating an engaging setting to live, work within, and visit.

The Nursing Home will have two courtyards for use by the residents. The design of these courtyards seeks support privacy, security, and safety, while creating a comfortable environment with a range of uses. The landscape spaces are designed to cater for both communal and personal use at a more intimate scale for individuals.

Easily identifiable circulation routes and boundaries help define site legibility and encourage residents to explore the various gardens. Path and boundary materials have been considered for their durability, aesthetic quality, accessibility, and to account for the needs of residents.

The external landscape surrounding the Primary Care Centre and Nursing Home has been designed to create a Riverside Walkway/ Greenway along the **Rye Water River** which will integrate into the landscape strategy for the wider masterplan area.



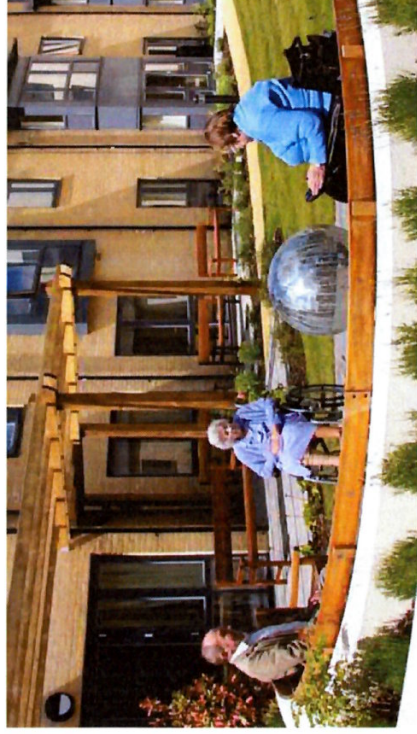
Landscape Masterplan



Landscape Moodboard



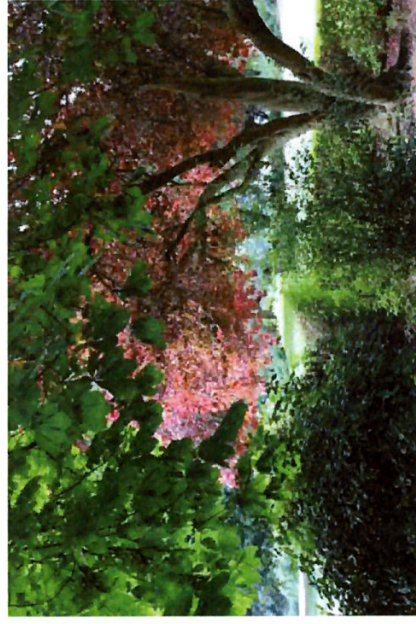
Upright trees to frame buildings



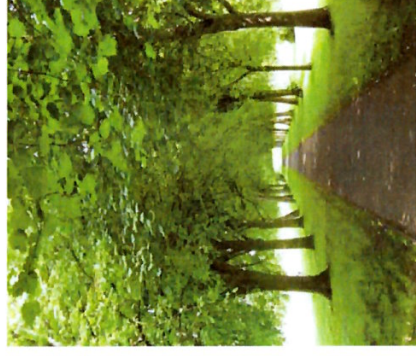
Communal Seating Areas



Pollinator Friendly Planting



Place for Reflection



Tree lined paths



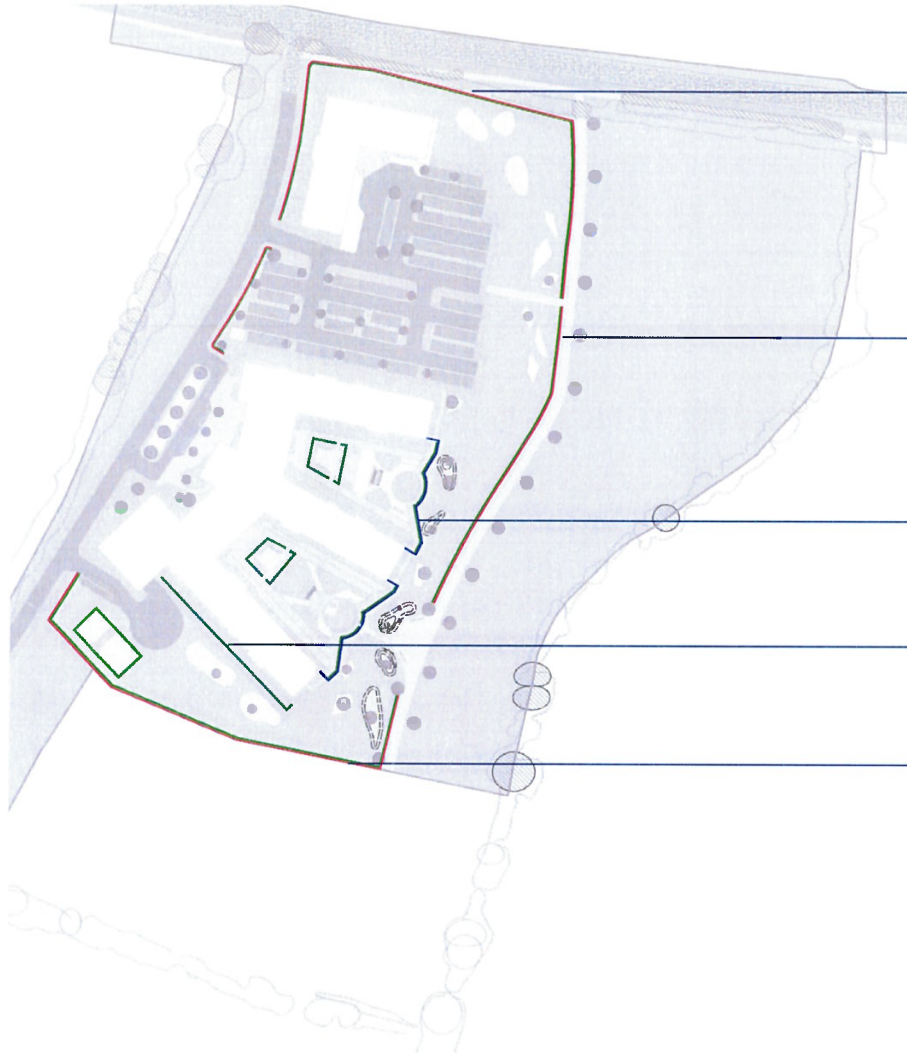


Connectivity

A key objective of the scheme is to create a setting where pedestrian experience is a priority. A palette of high quality landscape materials has been suggested to facilitate legible and comfortable movement within the site and to street linkages with surrounding opportunities.

The riverside walk will connect to the wider parkland that is envisaged as a part of the wider masterplan proposals which are the subject of separate planning applications. The design brief is to create an exemplar of sustainable development, providing opportunities for habitat management and conservation, recreation, tourism and education.

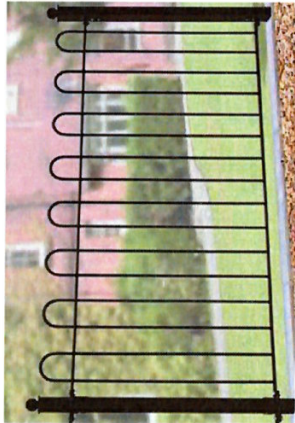




Structural Hedge Planting
1m high



Native Hedgerow
.6m high



Parkland Railing
1.2m high



Timber Post and Rail Fence
1.4m high

Parkland Railing / Gate Access (1.2m high)
(3 Bar Powder Coated Black) or similar approved.



Timber Post & Rail Fence / Gate Access (1.4m high)
or similar approved.



Structural Hedgerow (450mm topsoil depth / 100cm single row)
Centres: 500mm



Species Name: *Prunus lusitanica*
Specification: c/g 3L 100cm ht.

Native Hedgerow (450mm topsoil depth / 100cm Double Staggered Row)
Centres: 500mm

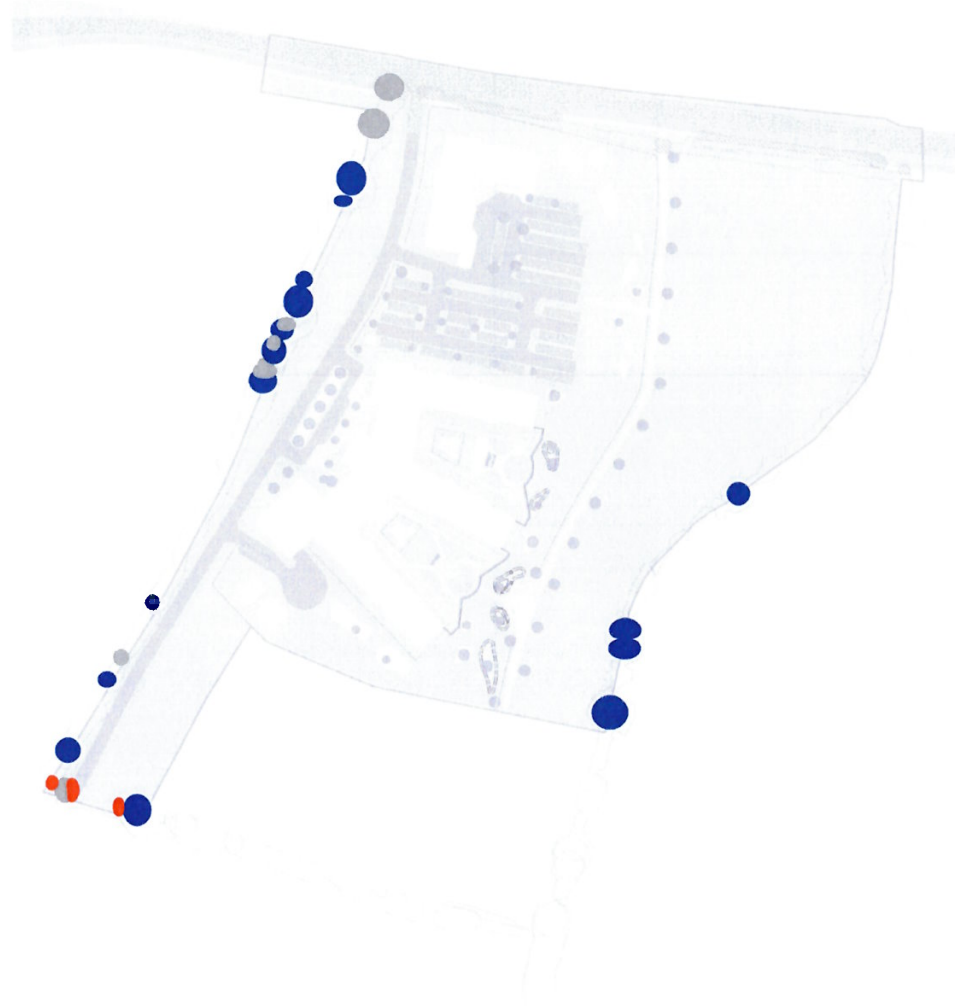


Species Name: *Crataegus monogyna*
Specification: c/g 2L 40-60cm ht.
Prunus spinosa
Specification: c/g 2L 40-60cm ht.
Vlex aquifolium
Specification: c/g 2L 40-60cm ht.
Rosa canina
Specification: c/g 2L 40-60cm ht.
Lonicera periclymenum 'Graham Thomas'
Specification: c/g 2L 40-60cm ht.



Landscape Sections





EXISTING TREES

27no.

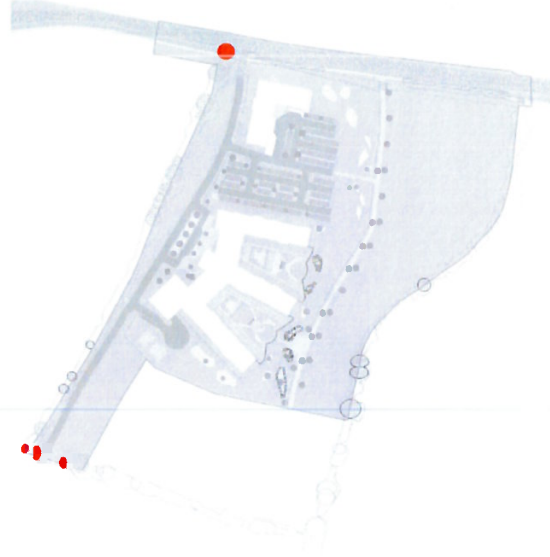
The design brief is to minimise the input upon the existing landscape to the maximum extent possible and to retain and augment existing trees and hedgerows. A total of 27 trees were identified and assessed.

The condition of trees are moderate to low quality, distributed across the north and south boundaries.



% of the total number of the existing trees

Arboricultural Impact



1no. tree is due for removal as a result of the proposed road upgrades.



Retained Trees & Hedgerows



Existing Trees

Existing Hedgerows to be retained, and augmented where necessary with native species



Existing Hedgerow - Aerial View

The landscape design proposal aims to preserve the former agricultural vernacular by retaining the existing landscape structure of field boundaries, and where possible, by maintaining existing hedges and boundary trees.

This includes the hedgerow along the northern boundary and most of the hedgerow that runs parallel to the R157 (although a small section will be lost to facilitate the creation of a new roadway entrance). Retention and protection of mature vegetation and established hedgerows will ensure there is minimal impacts on biodiversity and it will allow the existing hedgerows their continued function as a wildlife corridor for the area.



LANDSCAPE FEATURES





1 COMMUNAL SEATING



2 TIMBER SEATING



3 LANDSCAPE STRUCTURES



4 BICYCLE PARKING



Landscape Features

Hard Landscape Palette

Finishes

ELEMENTS PALETTE

Wooden seating element



Omos Seating s96w Seat
Or similar Approved



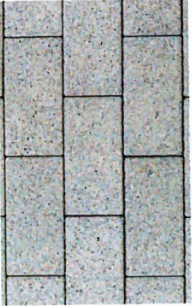
Flush Slipform
Concrete Kerb



Sheffield Cycle Stands
- 1000mm x 1000mm



Tobermore City Pavers
- Graphite 300x150x100mm



Tobermore City Pavers
- Silver 300x150x100mm

PAVING PALETTE

Light coloured flags to maximum light within courtyards w/
contrasting paving blocks



SURFACE PALETTE

Resin-bound surfacing for high impact areas across the
development



Ballylusk Dust Path
(pedestrian path)



Coloured tarmac
(cycle path)

TRAFFIC AREA & PARKING



Grasscrete Parking Bay



Country Kerb & Edge

IN-SITU SURFACES



Brushed Concrete with
trowel edge finish (streets)



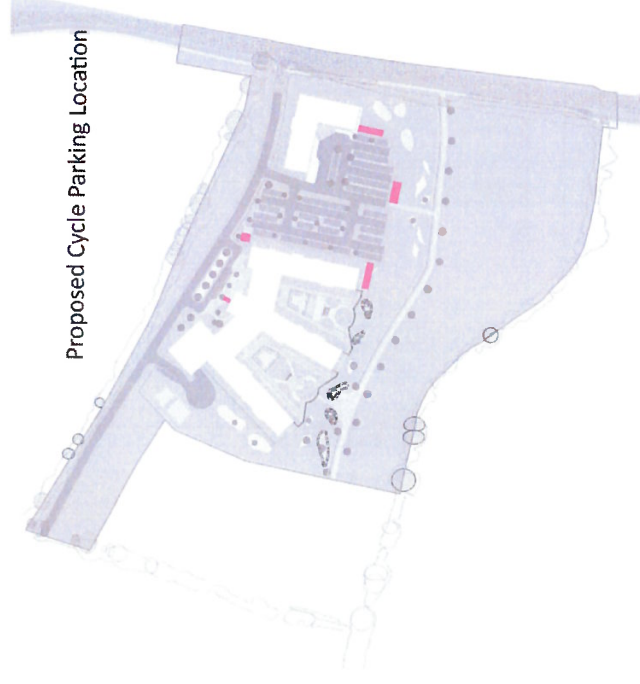
Tarmac



Permeable Asphalt



Sheffield Cycle Stand Root Fixedor similar Approved



Covered Cycle Storage Area



Landscape Features

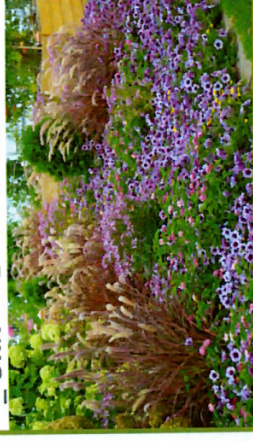
Proposed Planting Soft Landscape Plan



1_ WILDFLOWER & BULBS PLANTING



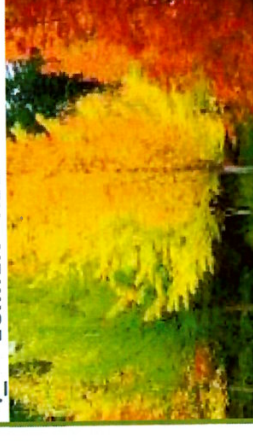
2_ ORNAMENTAL PLANTING



3_ SENSORY PLANTING



4_ SPECIMEN TREES



5_ MULTI STEMMED TREES





Proposed Shrub Planting

Proposed Wildflower Planting

Proposed Hedgerow

Existing Hedgerows (Retained & Augmented)

Retention and enhancement of biodiversity ensures that the natural, cultural, and health requirements of communities are integrated into the new development.

This green infrastructure proposal follows an overarching strategy of protecting, creating, enhancing, and connecting the natural heritage and biodiversity value of the lands.

Existing trees and hedgerows are to be retained where possible, along the site boundary around which passive and active open space areas are arranged.

The provision of 100no. new trees, along with shrub and wildflower planting seeks to maximise the environmental benefits and habitat creation.

Additional native hedgerow planting is also proposed throughout the site and will provide commuting and nesting habitat for a variety of species. New native hedgerows are linked with existing hedgerows where possible to enhance and create ecological corridors.

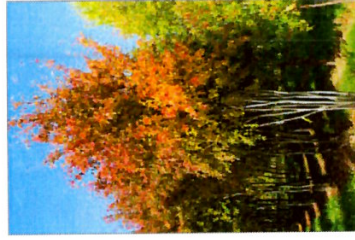


Landscape Features

Proposed Planting

Street and Open Space Trees

100no.



**Entrance Plaza
12-14cm**

Amelanchier lamarckii



Multistemmed Trees 12-14cm

Prunus avium 'Plena'

Malus 'John Downie' ^

Betula utilis var. jaquemontii



Street Trees 14-16cm

Tilia tomentosa 'Brabant'

Carpinus betulus 'Fastigiata'

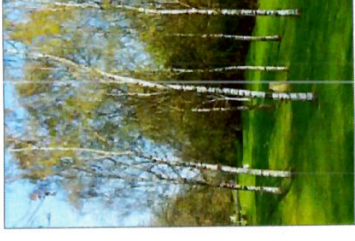
Tilia cordata 'Greenspire' ^

calleryana 'Chanticleer'

Sorbus acuparia ^



Pyrus



Open Space 14-16cm / 20-25cm

Betula pendula

Pinus sylvestris

Alnus glutinosa

Quercus robur

Quercus robur 'Koster'

Aesculus hippocastanum ^

Fagus sylvatica

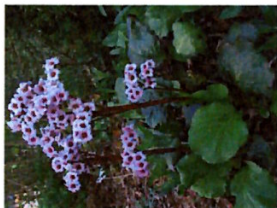
Prunus avium ^



Proposed Planting Shrubs - To Private Spaces



Persicaria affine



Bergenia cordifolia



Libertia grandiflora



Aucuba japonica



Prunus 'Otto luyken'



Lavandula angustifolia



Hypericum hidcote



Astelia 'Silver Spear'



Agapanthus 'Blue Giant'



Kniphofia 'Royal standard'



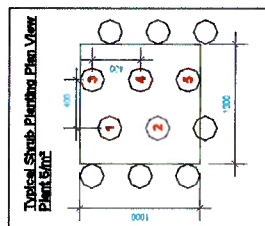
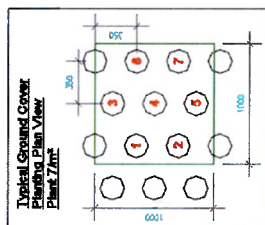
Nerine bowdenii



Sedum spectabile



Proposed Shrub Location



Proposed Planting

Hedgerows

H1 - Hedgerow Planting Detail

Hedge mix
60-90mm

100% *Prunus lusitanica*

50 x 50 stake tied with a
single rubber gut tie.
2 rows @ 500mm centres -400mm
apart.



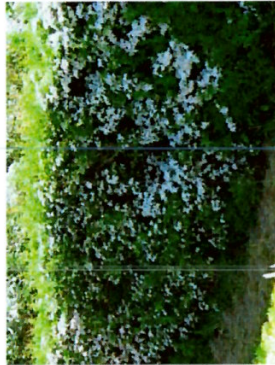
Hedge Type 1 Mix
Prunus lusitanica Hedge

H2 - Hedgerow Planting Detail

Hedge mix
60-90mm

Crataegus monogyna
Prunus spinosa
Ilex aquifolium

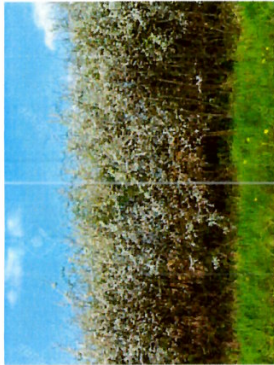
50 x 50 stake tied with a
single rubber gut tie.
2 rows @ 500mm centres -400mm
apart.



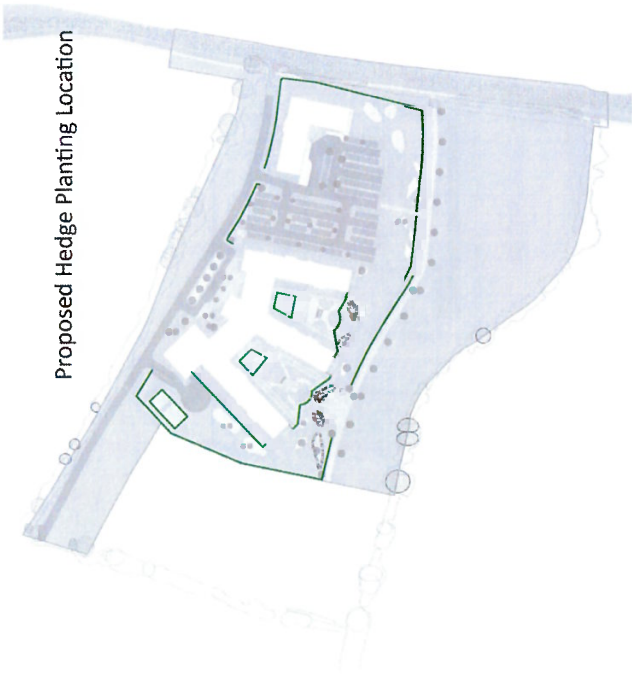
Hedge Type 2 Mix
Crataegus monogyna



Hedge Type 2 Mix
Ilex aquifolium



Hedge Type 2 Mix
Prunus spinosa



Proposed Hedge Planting Location

Native hedgerows will be maintained and managed for wildlife, this includes allowing hedgerows to grow wide and dense at the base, with a wide, uncultivated grassy margin. Hedgerows should be allowed to mature before the first cut and future cutting should happen on a 3/5-year rotation. Hedgerows should be kept as dark spaces to allow commuting and foraging habitat for local wildlife.



Proposed Planting Wildflower Mix



Marsh Thistle
Cirsium palustre



Common Knapweed
Centaurea nigra



Sneezewort
Achillea ptarmica



Meadowsweet
Filipendula ulmaria



Common Bent
Agrostis capillaris



Meadow Foxtail
Alopecurus pratensis



Oval Sedge
Carex ovalis



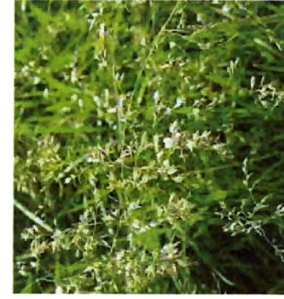
Tufted Hair Grass
Deschampsia caespitosa



Red Fescue
Festuca rubra



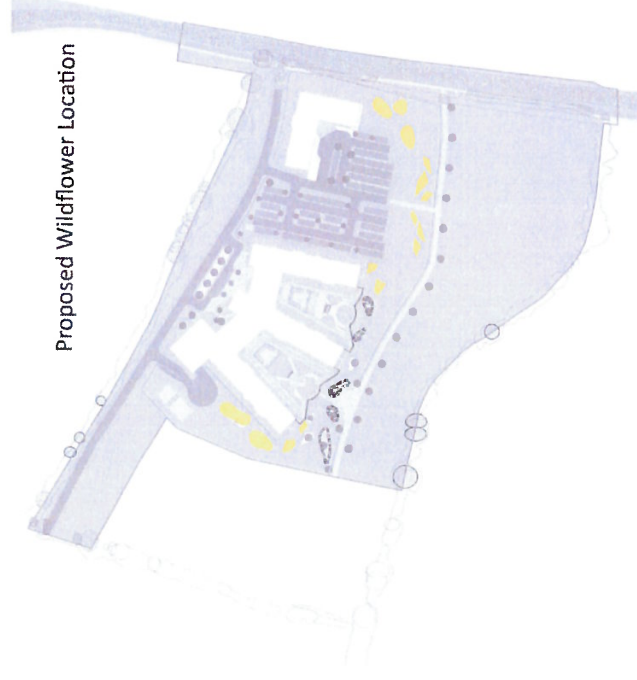
Reed Canary Grass
Phalaris arundinacea



Smooth-stalked Meadow
Grass - *Poa pratensis*



Devils-bit Scabious
Succisa pratensis



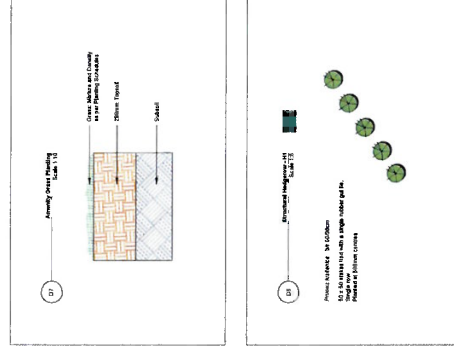
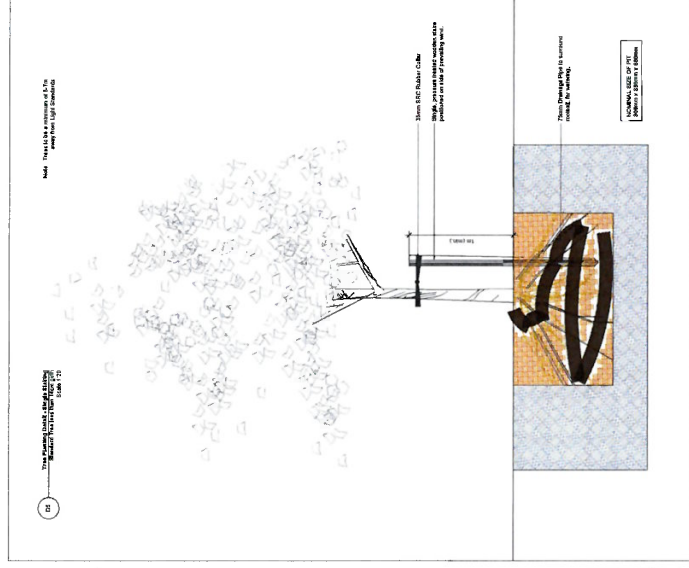
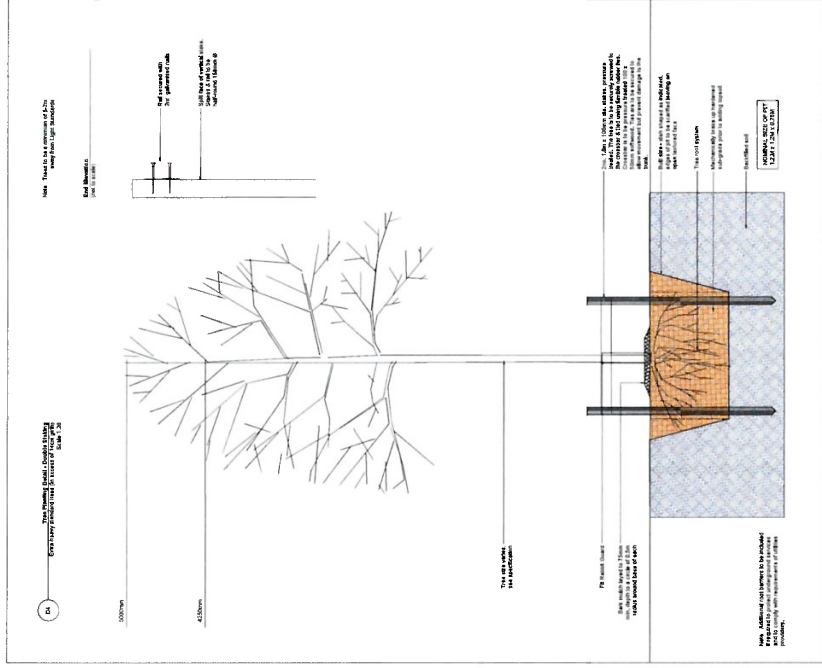
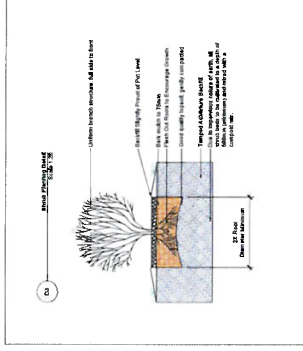
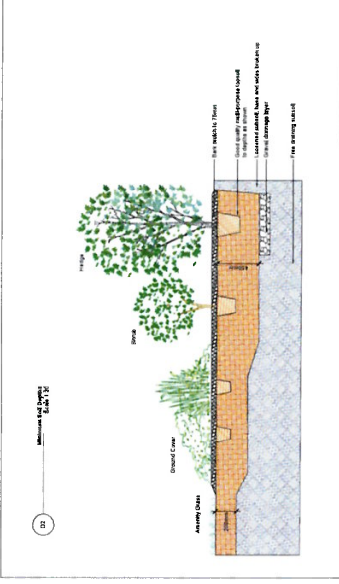
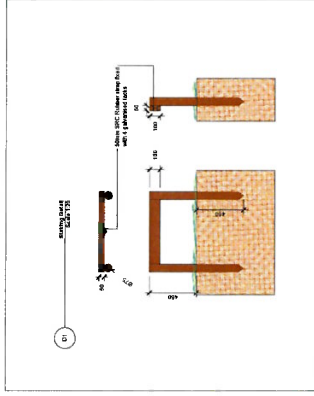
Native wildflower meadows are proposed and will provide a food source for local pollinators. The wildflower meadows will be managed in-line with the All-Ireland Pollinator Plan.

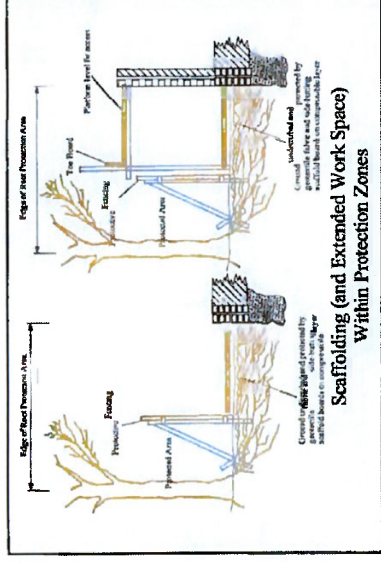
Note: The Wildflower Meadow will need to be cut once in Autumn (Late August/Early September) with a tractor and mower. Leave the mowings for a few days to allow seed to drop to the ground. Then it should be baled and bales removed.



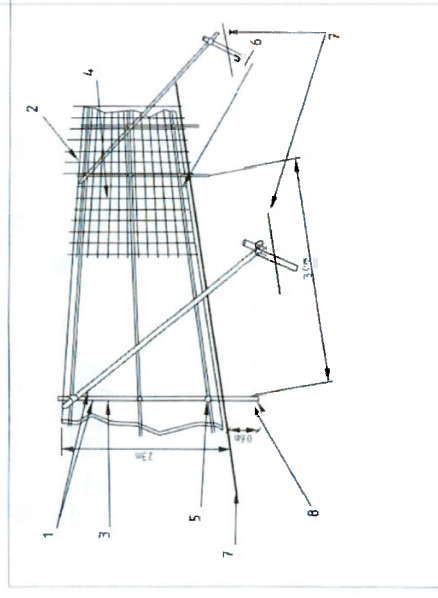
DETAILED DESIGN







Appendix 1. - Protective Barrier



The above displays an example of a suitable protective barrier as recommended by BS 5837 2012 *Trees in Relation to Construction*

1. Standard scaffold poles
2. Uprights to be driven into the ground
3. Panels secured to uprights with wire ties and where necessary standard scaffold poles
4. Weld mesh wired in the uprights and horizontals
5. Standard clamps
6. Wire twisted and secured on the inside of feeding to avoid easy dismantling
7. Ground level
8. Approx. 0.6m driven into the ground

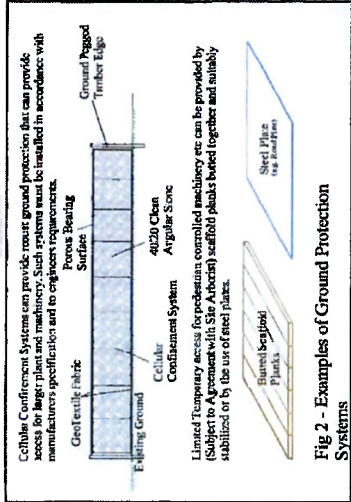
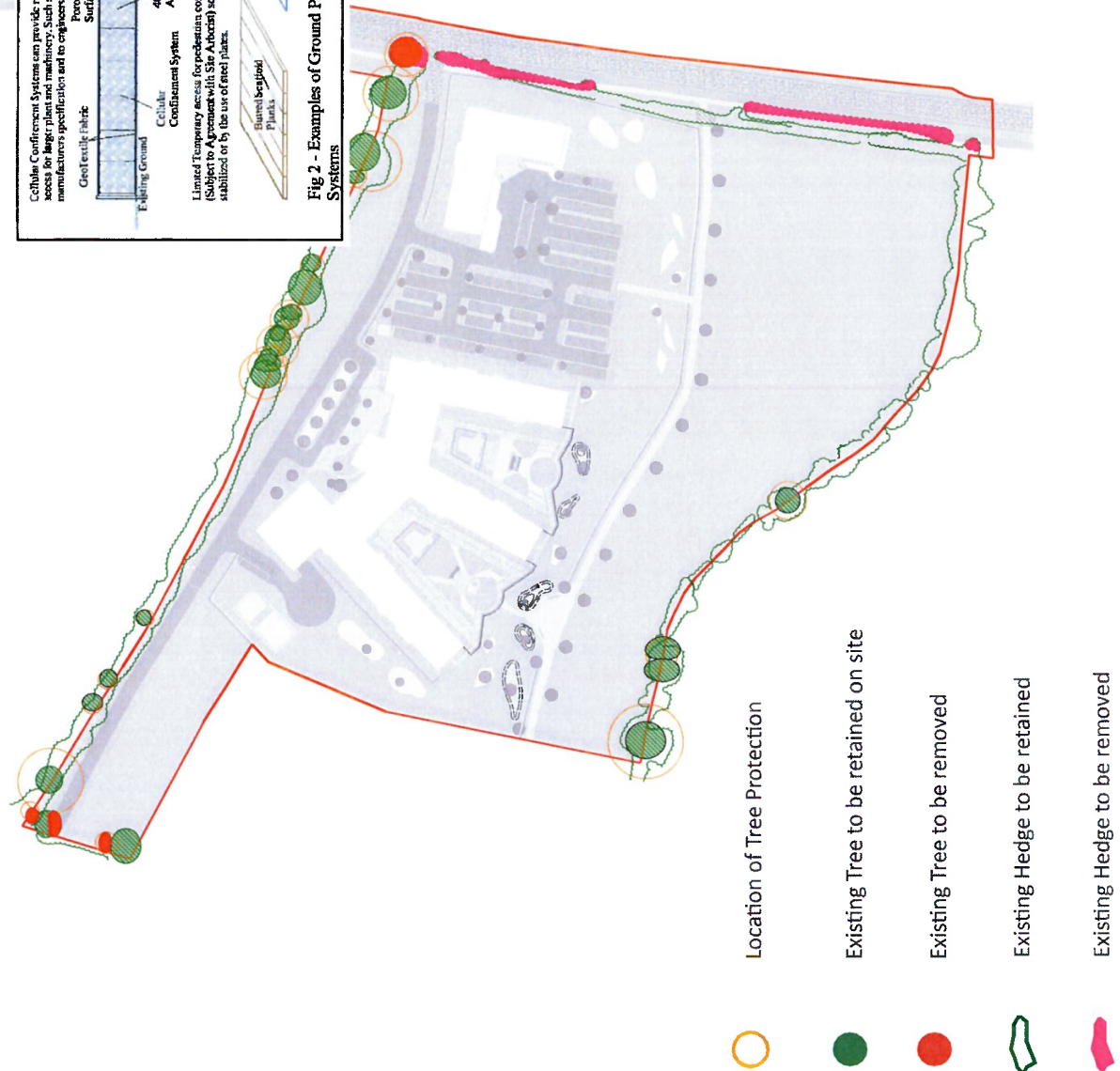


Fig 2 - Examples of Ground Protection Systems

The tree protection fencing is to be erected enclosing the root protection areas around the trees being retained as shown on this drawing and appendix 1. In some areas, the site hoarding may be sufficient to act as the protective fencing if the tree and its root zone are positioned outside and no works are envisaged within the area outside the site hoarding. This will need to be discussed and agreed at the initial site meeting.

Where tree protection fencing is needed, this will need to be 2.3m high and constructed in accordance with figure 2 of BS 5837 2012 (see detail on drawing & appendix 1) using vertical and horizontal scaffold bars or similar well braced together with the verticals spaced out at a maximum of 3m centres. On to this, weld mesh panels (harris fence panels) are to be securely fixed with wire or scaffold clamps.

Signs are to be attached to these fences warning people that this is a protective area and that the fencing must be maintained in good condition in accordance with the approved plans and drawings for this development.

Once the protective fence line is erected, then the main construction works can commence on site.

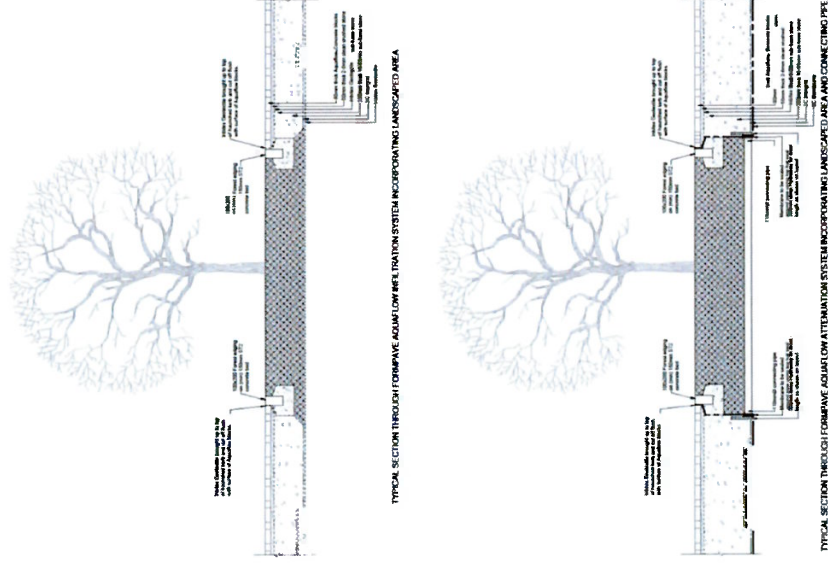
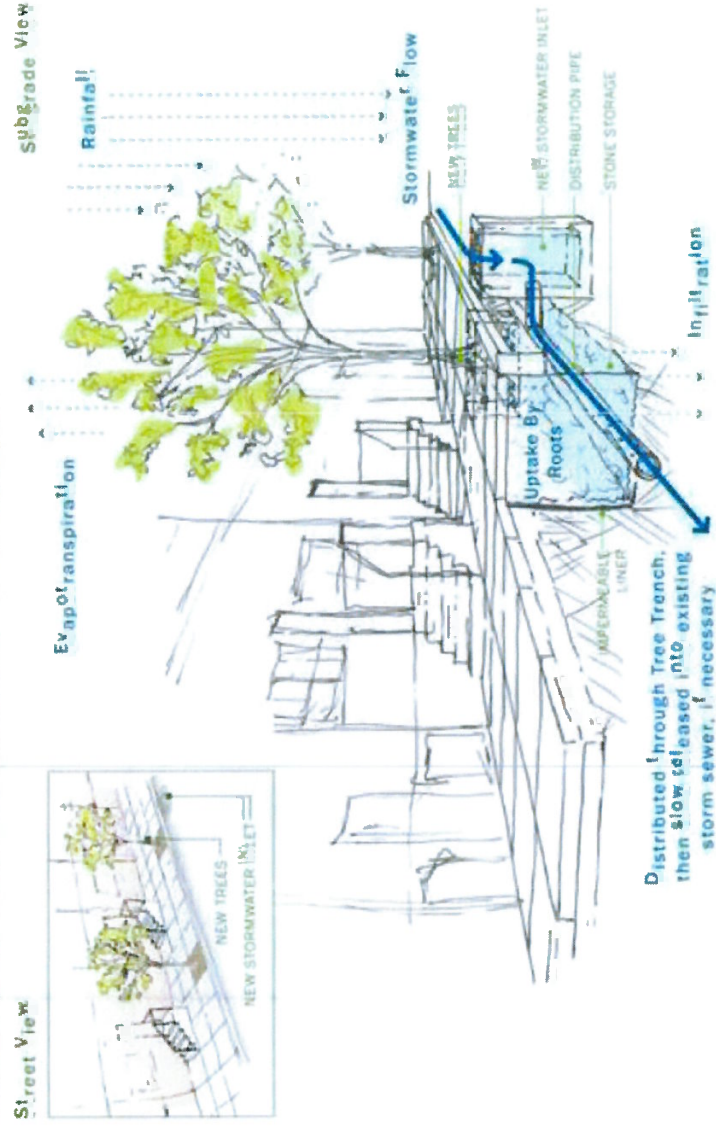
The following is a list of activities that are not allowed within the RPA or within the vicinity of the trees being retained.

- o Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials.
- o Protect root systems from ponding, eroding, or excessive wetting caused during construction operations.
- o Do not store construction materials, debris, or excavated material inside tree protection zones. When excavating, place excavated soil on opposite side of trench away from the tree.
- o Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.
- o Do not allow fires under or adjacent to remaining trees or other plants.
- o Do not attach notice boards, cables or other services to any part of the tree.
- o Do not use neighbouring trees as anchor points.
- o Do not use high machinery such as tele-ports, cranes or other equipment close to trees to avoid damage to the crown or any other parts.

During the construction works the following is required:

1. The main contractor or site manager is to brief all people working on site on the tree protection measures and the procedure if works need to be carried out within these areas.
2. Storage of Material, Work Yards and staff car parking- are to be identified on the work drawings prior to the construction works starting. These need to be positioned outside the root protection areas around the trees being retained.
3. The main contractor or site manager is to check the tree protective fencing daily and carry out any repairs required to ensure its stays upright and secure.
4. The main contractor or site manager is to liaise with the project arboriculturist if and when works are to be carried out close to or within the root protection areas around the trees.
5. Any works to occur within the protection areas such as landscaping is to be carried out manually with no machinery allowed. All soil and hard landscaping within the Root Protection Area (RPA) of the trees to be retained are to be carried out manually and the soil levels are not to be lowered or raised. Any works in root damage to the trees. Recommendations of sections 8 of BS5837 2012 are to be adhered to during the landscaping within the RPAs of the trees being retained.
6. The protective fencing around the trees is to stay in position until all the construction works are complete and are only to be removed following discussions and agreement with the project arborist.

GREEN STREETS: STORMWATER TREE TRENCH



Ronan Mac Diarmada & Associates

Landscape Architects & Consultants





APPENDIX 4-8

**DMURS COMPLIANCE
STATEMENT**

DMURS COMPLIANCE STATEMENT

PRIMARY CARE CENTRE & NURSING HOME

Sky Castle Ltd

S665

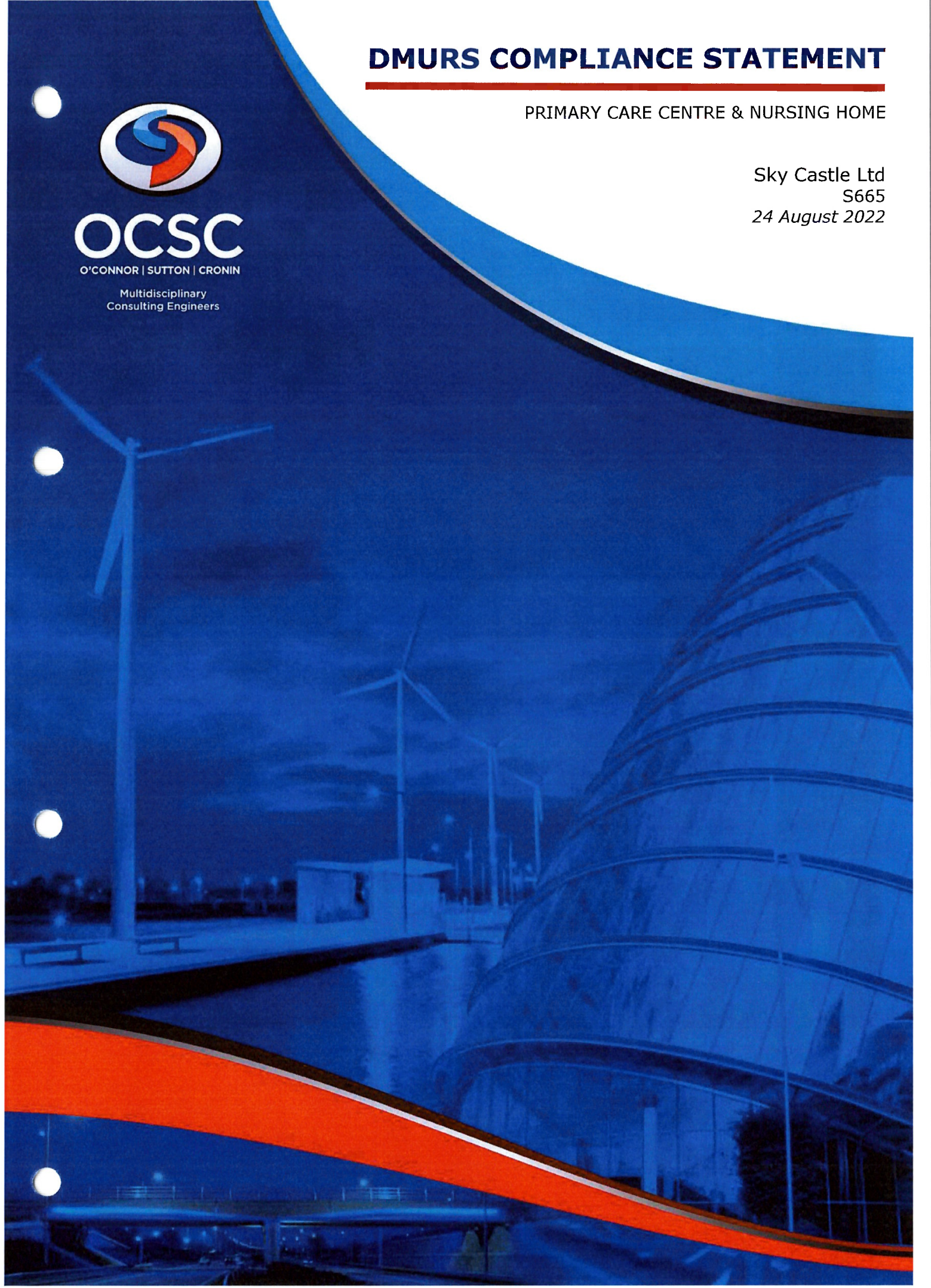
24 August 2022



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DMURS COMPLIANCE STATEMENT

Primary Care Centre & Nursing Home

Sky Castle Ltd

S665

24 August 2022

DMURS COMPLIANCE STATEMENT

PRIMARY CARE CENTRE & NURSING HOME



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DOCUMENT CONTROL & HISTORY

OCSC Job No.: S665	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision
	S665	OCSC	1B	XX	RP	C	0006	S4	P05
Rev	Status	Author	Checked	Authorised	Issue Date				
P05	S4	JT	WM	AH	24/08/22				
P04	S4	WM	AH	AH	29/07/22				
P03	S4	WM	AH	AH	26/04/22				
P02	S2	WM	AH	AH	30/03/22				
P01	S2	SMG	SMG	AH	09/10/21				

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by *DMURS Compliance Statement* to carry out the design of the civil engineering services associated with the development of a proposed Primary Care Centre (PCC) and a Nursing Home Unit at Moygaddy, Co. Meath, which is located northeast from the town of Maynooth, Co. Kildare.

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.

The proposed development comprises:

1. Construction of a new two-storey Nursing Home of 156 no. bedrooms with a Gross Floor Area (GFA) of 8,576m², including vehicular drop-off area and service road.
2. Construction of a new three-storey Primary Care Centre (PCC) with a Gross Floor Area (GFA) of 3,049m², including vehicular drop-off area.
3. The development includes a shared surface car park providing 161 no. car parking spaces (comprising of 151 no. standard car parking spaces and 10 no. accessible car parking spaces) and approximately 160 no. bicycle parking spaces.
4. Provision of foul and surface water drainage including an underground wastewater pumping station.
5. Connection to potable water supply at Kildare Bridge.
6. Provision of communal (semi-private) and public open space.
7. Provision of hard and soft landscaping including amenity equipment, fencing and gates.
8. Provision of substation and public lighting.
9. Proposed road improvement and realignment works along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556), including:
 - (i) Construction of a new 2-way, 6m-wide access road from the R157 Dunboyne Road to include a priority T-junction on the R157 which includes a right-turn lane from the R157 into the access road,
 - (ii) Upgrade works to a section of the R157 from the new site entrance south to Kildare Bridge on the R157 (representing delivery of a 15m-wide portion of the

Maynooth Outer Relief Road (MOOR)), including creation of a new 2m-wide footpath, 3m-wide cycle lane and pedestrian and cycle link adjacent to Kildare Bridge,

(iii) Provision of pedestrian and cycle improvement measures.

10. All other site development works and services ancillary to the proposed development.

11. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the planning application.

A separate application will be made to Kildare County Council for the upgrade of the R157 south of the Kildare Bridge. This overlap of applications will ensure unimpeded access to the proposed development lands for all modes of transport including vehicular and dedicated pedestrian and cyclists' facilities.

The proposed link roads and streets together with the junctions, footpaths and cycle facilities have been designed in accordance with requirements of the Design Manual for Urban Roads and Streets (DMURS) and the National Cycle Manual (NCM). DMURS is the design philosophy used in the design of all new residential roads and urban streets and the key objective of DMURS is to achieve safe, attractive, and vibrant streets by balancing the needs of all users, and prioritising alternatives to car journeys. The subject site is fully consistent with this recommended approach whilst also facilitating efficient and secure internal movement. The site layout encourages permeability through the site, connecting to the wider area via pedestrian links and cycleways and seeks to prioritise pedestrian and cyclists in accordance with the policies set out in DMURS.

The scheme complies with the following key DMURS Design Principles:

INTEGRATED STREET NETWORKS

The subject site will be linked to Maynooth Town Centre via the existing R157, which will be upgraded from Kildare Bridge up to the access road to this site, as part of this application. New dedicated pedestrian and cyclist infrastructure will be provided along

this section of the R157. All footpaths within the development will be a minimum of 1.80m wide and will run parallel to the proposed road infrastructure. The development will be serviced by way of a priority controlled T-junction with the R157.

The provision of infrastructure on the R157 will include 7.0m carriageway, 1.5m verge, footpath and also cycle tracks designed in accordance with the National Cycle Manual.

Pedestrian and cyclist infrastructure will also be provided along the R157 linking the primary care centre & nursing home development to the rest of the developments on the Moygaddy lands, as well as the greater Maynooth Environs.

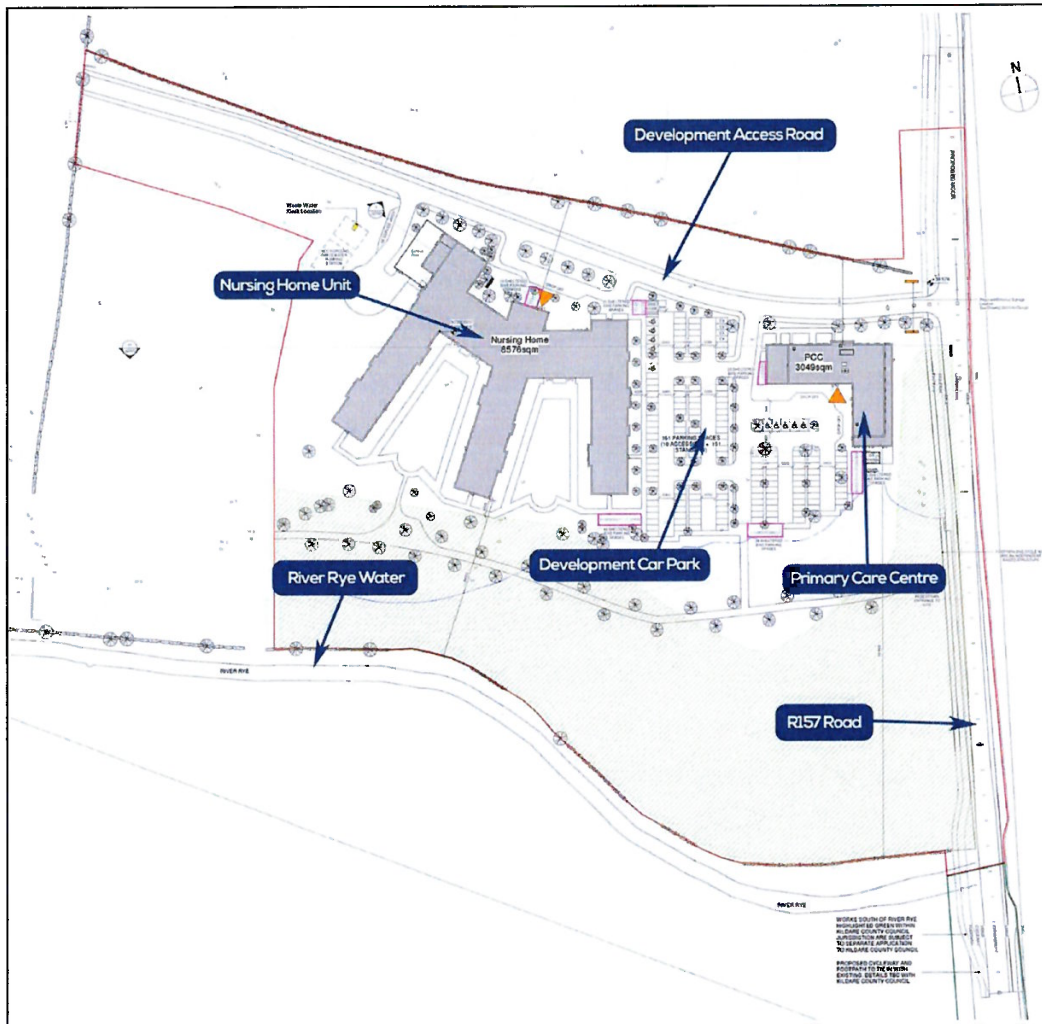


Figure 1: Site Layout

MOVEMENT AND PLACE

The proposed development incorporates a permeable and legible street network that offers flexibility for managing movement. There is a fully integrated pedestrian network with all the main landscape spaces connected to a universally accessible route. In line with best practice the design incorporates an orthogonal type street layout thus promoting legibility as well as connectivity.

The proposed network is safe and structured and will draw future occupants toward focal points including green open space.

PERMEABILITY AND LEGIBILITY

Pedestrian and cyclist movement is prioritised by providing a layout that restricts the speed of vehicular movements by use of vertical and horizontal deflection and by use of shared streets. A high degree of pedestrian permeability throughout the site is created by providing footways that connect the spaces between the Nursing Home and PCC with crossings located at each internal junction.

TRAFFIC MANAGEMENT

By assigning carriageway widths of 6.0m to the internal link road access, along with variations in the horizontal alignment of the access road, a natural traffic calming effect is provided in both a physical and psychological sense, which will assist in self-regulating vehicular speeds. Gradients proposed minimise the need for revving of engines and associated noise and emissions, while appropriate landscaping will absorb excessive sound. Pedestrian priority will be provided at some internal junctions in the form of raised entry treatments and tactile paving at crossing which also serve as a traffic calming measure. The location of the site will promote the use of public transport, walking and cycling thus contributing to reduced air emissions.

MOVEMENT, PLACE AND SPEED

High levels of pedestrian movement are catered for which supports vibrant and sustainable places. The segregation of vehicular traffic and the use of shared streets for cyclists and drivers within the development also supports the sense of place.

Element	Consistency with DMURS
Streets and Link Roads	All Link Road and Streets within the development to have a Hierarchy of Widths to include 6.00m for the main link road and where perpendicular parking occurs and 5.0 for the minor roads. Maximum road gradient 1:12 with minimum gradient 1:100. Corner Radii to be 6.0m on external junctions and 3.0m on all internal junctions. Speed Limits to be 30.0 kph.
Footpaths	All footpaths provided will be a minimum of 1.8m in line with DMURS. Proposed footpath along the R157 will be 2.0m wide. New footpath links will be constructed to enhance connectivity.
Cycle Facilities	The cycle facilities proposed are a combination of dedicated 1.75m off road cycle tracks along the R157. In addition, there will be on-road cycle facilities which are shared with vehicular traffic and acceptable for low traffic speed urban environments. The New cycle facilities that will be constructed along the R157 will eventually connect to the planned sections of the MOOR. No cycle facilities are proposed on the internal roads.
Junctions	The entrance junction is a priority junction with pedestrian and cycle crossings where required. All crossings to have appropriate tactile paving to aid vulnerable road users. Visibility standards maintained at all junctions.
Visibility	The internal development horizontal and vertical visibility to be maintained at all junctions and crossings in line with the 30 kph Design Speed.

CONCLUSION

As can be seen in the table above, it is considered that the design elements of the proposed street and link road in the development are in compliance with the objective of Design Manual for Urban Roads and Streets (DMURS) which aims to provide safe, attractive and vibrant streets by balancing the needs of all users, and prioritising alternatives to car journeys.

It is noted that the Road Safety Audit report for the proposed development has been prepared under a separate cover and will be submitted as part of planning application.

VERIFICATION

This report was compiled and verified by:

Joshua Tai BE, MIEI
Civil Engineer
O'Connor Sutton Cronin & Associates





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APPENDIX 4-9

ENGINEERING SERVICES

REPORT

Engineering Services Report

PRIMARY CARE CENTRE & NURSING HOME

For Sky Castle Ltd

PROJECT NO. S665

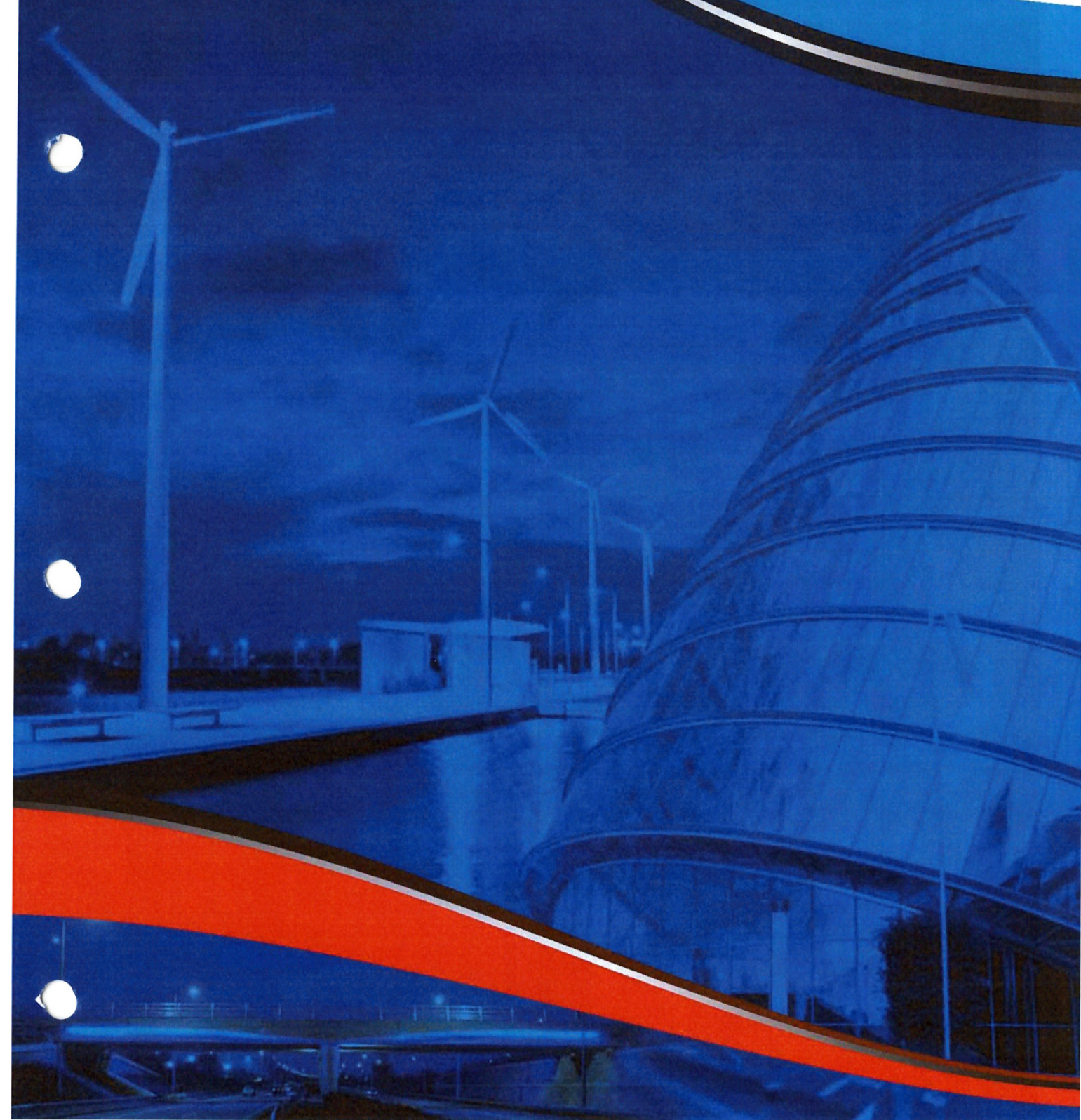
26 August 2022



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Engineering Services Report

**PRIMARY CARE CENTRE & NURSING HOME
for Sky Castle Ltd**

**PROJECT NO. S665
26 August 2022**

Engineering Services Report
for
PRIMARY CARE CENTRE & NURSING HOME,
at Moygaddy, Co. Meath.



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DOCUMENT CONTROL & HISTORY

OCSC Job No.: S665	Project Code	Originator	Zone Volume	Level	File Type	Role Type	Number	Status / Suitability Code	Revision
	S665	OCSC	1B	XX	RP	C	0002	S4	P06
Rev.	Status	Authors	C hecked	Authorised	Issue Date				
P06	S4	EH	MK	AH	24.08.2022				
P05	S2	EH	MK	AH	29.07.2022				
P04	S 4	ZB	MK	AH	27.04.2022				
P03	S2	ZB	MK	AH	04.04.2022				
P02	S2	ZB	AH	AH	09.12.2021				
P01	S2	MK	AH	AH	08.10.2021				

Engineering Services Report

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APPENDICES

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1 INTRODUCTION

1.1 Appointment

O'Connor Sutton Cronin & Associates (OCSC) have been appointed by *Sky Castle Ltd* to carry out the design of the civil engineering services associated with the proposed Moygaddy Health development, which shall primarily comprise a new primary care centre and nursing home at Moygaddy, Co. Meath, located north east from the town of Maynooth, Co. Kildare.

1.2 Administrative Jurisdiction

The proposed medical development is located in the jurisdiction of Meath County Council (MCC). It is noted that in order to serve the proposed development with water and wastewater infrastructure connections, extensions to and from the existing public services that are located in lands within Kildare County Council's jurisdiction will be required. Therefore, the engineering services design was carried out with reference to the following:

- Meath County Development Plan (2021 – 2027);
- Maynooth Environs Local Area Plan;
- Kildare County Council Development Plan (2017 – 2023);
- Regional Spatial and Economic Strategy;
- Greater Dublin Strategic Drainage Study (GDSDS);
- The Planning System and Flood Risk Management Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government and the Office of Public Works).

1.3 Site Location

The subject site is located on the southernmost extent of County Meath, aligning with the county boundary to Co. Kildare, and is approximately 1.30km north from the Maynooth town centre, as shown in **Figure 1.1 - Site Location**, and is immediately bound by:

- R157, to the east;
- Agricultural lands to the west and north; and

- River Ryewater to the south.

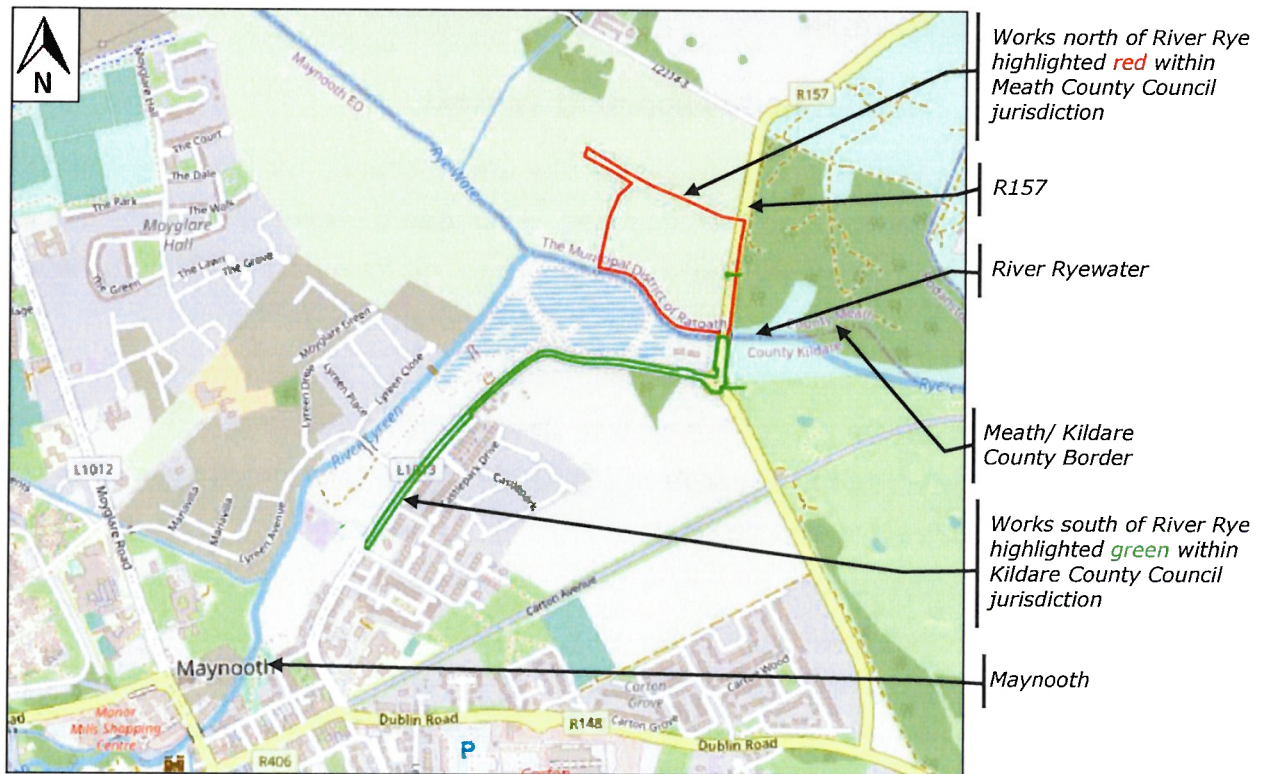


Figure 1.1 - Site Location

It is noted that in order to service the site for wastewater and watermain, to and from public infrastructure, additional infrastructure works are required to be carried out on lands in County Kildare, south of the Kildare Bridge. Details of these works are subject to separate planning application to Kildare County Council.

1.4 Existing Site Overview

The overall gross site area that comprises this planning application is **c.7.9-hectares**, with c.4.8ha of this zoned by Meath County Council for **G1 - Community Infrastructure**.

The site is currently greenfield and used for agricultural purposes. R157 regional road is located to the east of the subject site. Currently there is no vehicular access to the subject site off the R157. Ground levels across the site fall from northwest to southeast, with a sharp decline at the southern

boundary, which align the river Ryewater. Refer to *Section 3.4.1* for context of existing site levels.

1.5 Proposed Development Context

Planning Permission is sought by Sky Castle Limited for the development of a site which extends to 7.94 hectares, on land to the west of the R157 Dunboyne Road, County Meath, north of the town of Maynooth, in the townland of Moygaddy. This site is located in the Maynooth Environ Lands.

The proposed development comprises:

1. Construction of a new two-storey Nursing Home of 156 no. bedrooms with a Gross Floor Area (GFA) of 8,576m², including vehicular drop-off area and service road.
2. Construction of a new three-storey Primary Care Centre (PCC) with a Gross Floor Area (GFA) of 3,049m², including vehicular drop-off area.
3. The development includes a shared surface car park providing 161 no. car parking spaces (comprising of 151 no. standard car parking spaces and 10 no. accessible car parking spaces) and approximately 160 no. bicycle parking spaces.
4. Provision of foul and surface water drainage including an underground wastewater pumping station.
5. Connection to potable water supply at Kildare Bridge.
6. Provision of communal (semi-private) and public open space.
7. Provision of hard and soft landscaping including amenity equipment, fencing and gates.
8. Provision of substation and public lighting.
9. Proposed road improvement and realignment works along the R157 which abuts the Carton Demense Wall which is a Protected Structure (RPS Ref 91556), including:
 - i. Construction of a new 2-way, 6m-wide access road from the R157 Dunboyne Road to include a priority T-junction on the R157 which includes a right-turn lane from the R157 into the access road,

- ii. Upgrade works to a section of the R157 from the new site entrance south to Kildare Bridge on the R157 (representing delivery of a 15m-wide portion of the Maynooth Outer Relief Road (MOOR)), including creation of a new 2m-wide footpath, 3m-wide cycle lane and pedestrian and cycle link adjacent to Kildare Bridge,
 - iii. Provision of pedestrian and cycle improvement measures.
10. All other site development works and services ancillary to the proposed development.
11. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the planning application.

The proposed site layout is shown in **Figure 1.2 – Site Layout** below.



Figure 1.2 - Proposed Development Layout

1.6 Further Development Context

The developer has also committed to submitting a separate planning application to Meath County Council for the development of the Maynooth Outer Orbital Road (MOOR), which is to be routed from Moyglare Hall residential estate, on the north western extent of Maynooth, through the Applicant owned Moygaddy Environs lands and around to meet the R157 road, north from the Bridge. This is to align with the southwestern boundary of the subject application site.

Additional planning applications will be simultaneously submitted to Kildare County Council for the following two infrastructural works, which complement both the proposed development and the delivery of the MOOR:

1. Moyglare Bridge i.e., new bridge structure at southwestern extent of MOOR, including associated water services for extension and connection to public infrastructure;
2. Kildare Bridge upgrade, and associated infrastructure connections i.e., addition of pedestrian and cycle link.

The subject site is part of a larger land-holding, held by Sky Castle Ltd, which is zoned for Residential, Strategic Employment, Tourism, and Community Infrastructure. The applicant – Sky Castle Ltd – intends to submit separate planning applications for a and a Biomedical Office Campus, and a new strategic housing development, with associated infrastructure. These projects are subject to separate, independent planning applications, which will be accompanied by site-specific Engineering Services reports, and associated design drawings.

2 SCOPE OF ENGINEERING SERVICES REPORT

The Engineering Services Report was prepared by reviewing the available data from the Local Authority sources and national bodies *i.e.*, Meath County Council, Irish Water, The OPW, and the wider Design Team. The following services are addressed within this report, with respect to the proposed development:

- Surface Water Drainage;
- Wastewater Drainage;
- Potable Water Supply;
- Roads and traffic infrastructure.

The proposed design for the above engineering services have been carried out in accordance with the following technical guidelines and information:

- Meath County Council Development Plan;
- Kildare County Development Plan;
- Greater Dublin Strategic Drainage Study (GDSDS);
- Greater Dublin Regional Code of Practice for Drainage Works (GDR COP);
- Irish Water Code of Practice for Wastewater, IW-CDS-5030-03;
- Irish Water Code of Practice for Water Supply, IW-CDS-5020-03;
- The Building Regulations – Technical Guidance Document Part H;
- BE EN 752 – Drainage Outside Buildings;
- BS 7533-13 – Guide for Design of Permeable Pavements;
- CIRIA C753 – The SuDS Manual;
- The Office of Public Works, the Planning System and Flood Risk Management;
- Irish Water Drainage & Watermain Records;
- Design Manual for Urban Roads and Streets.

3 SURFACE WATER DRAINAGE

3.1 Surface Water Design Overview

3.1.1 Design Guidelines Overview

Any planning permission sought on the subject lands are required to adhere to the Local Authority requirements i.e., the Meath County Council Development Plan, the Maynooth Environs Local Area Plan, and as such, the Greater Dublin Strategic Drainage Study (2005).

New development must ensure that a comprehensive Sustainable Drainage System (SuDS), is incorporated into the development. SuDS requires that post development run-off rates be maintained at equivalent, or lower, levels than pre-development levels. Thus, the development must be able to retain, within its boundaries, surface water volumes from extreme rainfall events up to a 1 in 100-year rainfall event, more commonly expressed as a 1.0% AEP (Annual Exceedance Probability), while also allowing for an additional climate change factor of 20% increase in rainfall intensity. Any new development must also have the physical capacity to retain surface water volumes as directed under the Greater Dublin Strategic Drainage Strategy (GDSDS) and, if necessary, release these attenuated surface water volumes to an outfall at a controlled flow rate, not greater than the greenfield runoff equivalent.

A further component of the SuDS protocol is to increase the overall water quality of surface water runoff before it enters a natural watercourse or a public sewer, which ultimately discharges to a water body. This is to ensure the highest possible standard of surface water quality.

The surface water strategy for the proposed development is to include a number of Sustainable Drainage Systems, prior to discharging an attenuated and treated flow to the existing watercourses that align to the southern and eastern boundaries of the main development site. Development discharge rates are to be restricted to less than the calculated greenfield runoff equivalent.

3.2 Surface Water Management Strategy Overview

The proposed surface water network is to consist of a single catchment, in order to best integrate Sustainable Drainage Systems. This catchment area will look to provide treatment to the rainfall runoff, either at source or through site design. Infiltration systems are provided as part of the integrated SuDS network, however, as a results of the failed soakaway tests during site investigation, no infiltration is considered as part of the design. The main functions of the SuDS provided will be for interception and treatment of the rainfall runoff, in order to reduce the runoff volume and increase the runoff quality, prior to discharge from the new development.

The proposed surface water networks are to typically comprise a gravity pipe network, with significant Sustainable Drainage Systems implemented, where practicable.

The attenuation system is to be located within the carpark area due to the site topography, development layout and the flood zone boundary, and the design intent is to reduce the rainfall runoff from the proposed development to **less than** the greenfield runoff equivalent; thus, resulting in no adverse impact on the receiving watercourse.

3.3 Consultation

The proposed strategy has been discussed in detail with Meath County Council's (MCC) Drainage Department prior to submission, with all item discussion points addressed as part of the design submission.

3.4 Existing Site Drainage

3.4.1 Existing Site Catchment Areas

The c7.5-hectares that forms this planning application for a new Primary Care Centre and Nursing Home, has a development boundary of approximately 6.6-hectares that does not include works to existing public infrastructure area. The site itself currently has existing hedges and ditches, along its northern and western boundary that acts as a surface water catchment boundary. The entire

site is then graded towards the river Ryewater, which aligns with its southern boundary. Refer to **Figure 3.1** for overview of site contours, indicated at 0.25m interval.

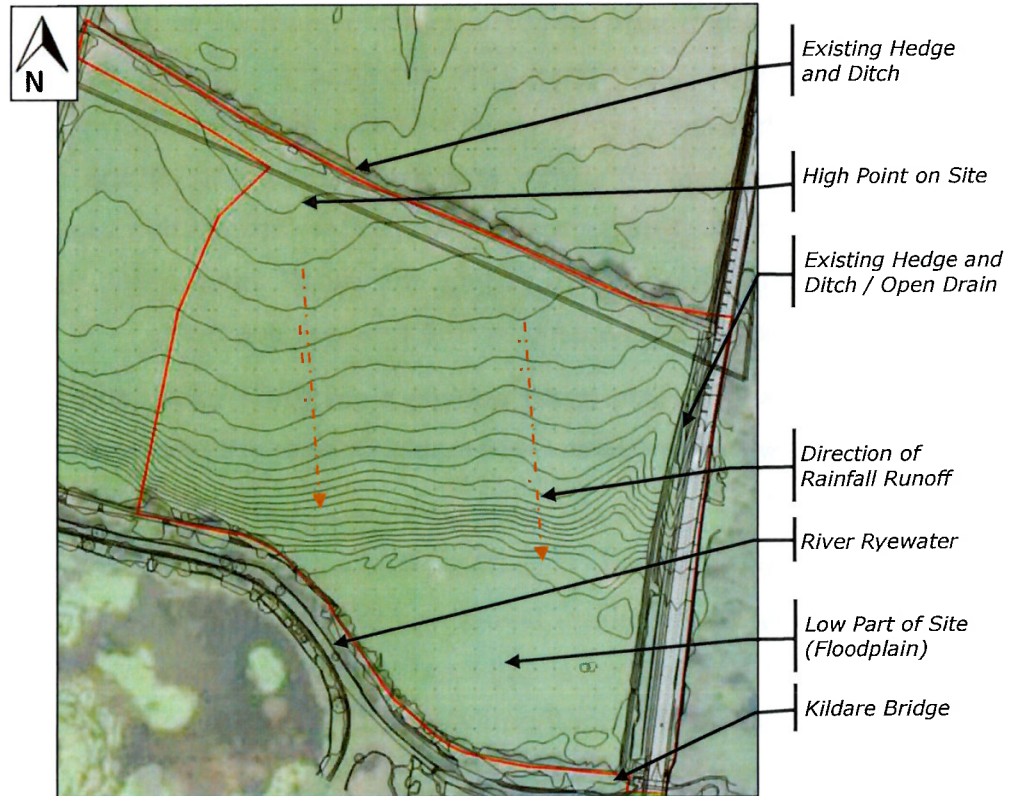


Figure 3.1 – Site Levels and Contour Overview

The subject site itself is currently an unused agriculture field, as shown in the aerial image in **Figure 3.2**.



Figure 3.2 - Aerial Image of Subject Development Site

3.4.2 Existing Surface Water Drainage Infrastructure

There is currently no existing public surface water drainage infrastructure in the immediate vicinity of the site that can serve the proposed development.

The river Ryewater runs along the southern site boundary. The site currently drains naturally to this watercourse, either overland, or via the agricultural drainage ditches that bound the site; refer to **Figure 3.3** for overview of existing natural watercourse in the vicinity of the proposed development.

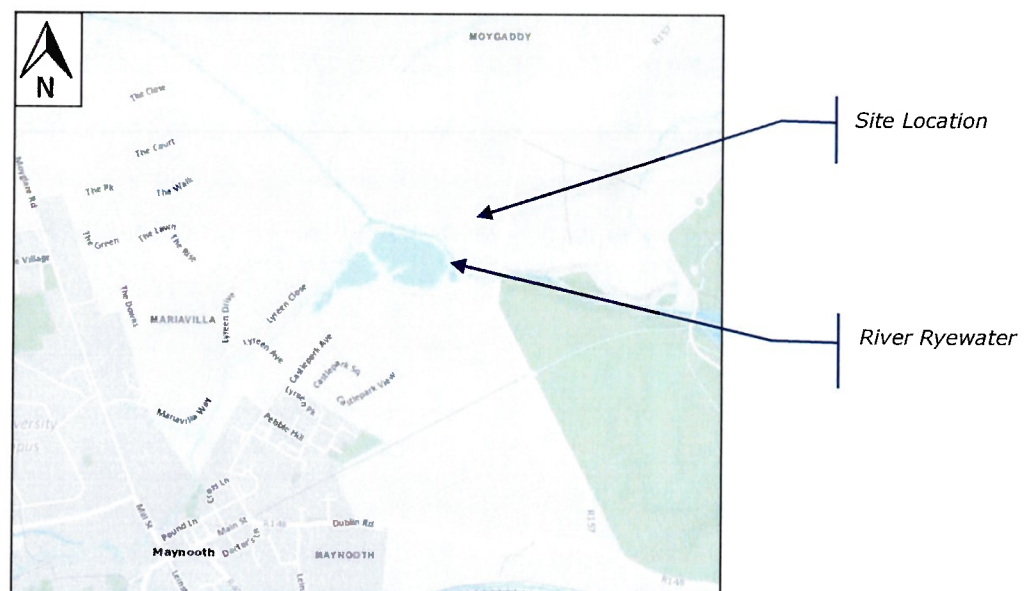


Figure 3.3 - Local Watercourses

3.4.3 Existing Site Rainfall Runoff

All surface water runoff, on the existing site, currently infiltrates to the ground or discharges excess runoff to the river Ryewater, located along the southern site boundary. Refer to *Section 3.4.1* for further details of existing site catchment area context.

A Site investigation was carried out on site in July 2021, with 3nr. soakaway tests performed to BRE Digest 365 requirements, at locations in the vicinity of open space in the new development. All 3nr. tests failed, with little to no infiltration observed. The existing subsoil was determined to be of stiff clayey substance, consistently across the site. It is noted that groundwater was not observed at the location of SuDS structures, including attenuation systems.

A copy of the site investigation has been submitted as part of this planning application.

Therefore, as a result of the above, **Soil Type 4** has been assigned for rainfall runoff calculations, as discussed and agreed with Meath County Council.

The Standard Average Annual Rainfall (SAAR) value for the development site, as sourced from Met Éireann, is **799mm**.

Using the ICPSuDS Input, (Flood Studies Report, FSR) Method, the rainfall runoff discharging from the total greenfield site area that is to be developed has been estimated at $QBAR_{RURAL}$ **5.6 l/s/ha**, in its existing condition.

Refer to **Figure 3.4** for an excerpt of the results from the MicroDrainage Runoff Calculator, which provides the calculated $QBAR$ (*per hectare*) runoff rate, along with the discharge rate (*per hectare*) for varying Annual Recurrence Intervals (ARI).

ICPSUDS Input (FSR Method)

Return Period (Years): 2

Area (ha): 1.000

SAAR (mm): 799

Soil: 0.470

Growth Curve: (None)

Partly Urbanised Catchment (QBAR)

Urban: 0.000

Region: Ireland East

Calculate

Results

QBAR rural (l/s): 5.6

QBAR urban (l/s): 5.6

Return Period Flood

Region	QBAR (l/s)	Q (2yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Ireland East	5.6	5.4	4.8	9.2	10.7
Ireland South	5.6	5.4	4.8	9.0	10.4
Ireland West	5.6	5.4	4.8	9.7	10.0
Ireland Greater Dublin	5.6	5.2	4.8	12.0	14.7

OK Cancel Help

Enter Return Period between 1 and 1000

Figure 3.4 - Existing Site Runoff Calculator Results (MicroDrainage Excerpt)

3.5 Proposed Surface Water Drainage Design Strategy

3.5.1 Proposed Surface Water Strategy Overview

It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the adjacent watercourse (for surface water only) and local wastewater sewer network respectively. Refer to *Section 5* for details of the proposed wastewater drainage design.

3.5.2 Climate Change Allowance

As indicated in **Figure 3.11**, the proposed network is to be designed to allow for an additional 20% increase in rainfall intensity, to allow for Climate Change projections, in accordance with the Meath County Council Development Plan and the GDSDS.

All discussion within this report, with regards to surface water network design calculation and results, include for the allowance of an increase of 20% in rainfall intensity, as required.

3.5.3 Proposed Surface Water Network Strategy

The proposed surface water network is to consist of a single catchment, in order to best integrate Sustainable Drainage Systems. This catchment area will look to provide treatment to the rainfall runoff, either at source or through site design. Infiltration systems are provided as part of the integrated SuDS network, however, as a results of the failed soakaway tests during site investigation, no infiltration is considered as part of the design. The main functions of the SuDS provided will be for interception and treatment of the rainfall runoff, in order to reduce the runoff volume and increase the runoff quality, prior to discharge from the new development.

The proposed surface water networks are to typically comprise a gravity pipe network, with significant Sustainable Drainage Systems implemented, where practicable.

The attenuation system is to be located within the carpark area due to the site topography, development layout and the flood zone boundary, and the design intent is to reduce the rainfall runoff from the proposed development to **less than** the greenfield runoff equivalent; thus, resulting in no adverse impact on the receiving watercourse.

The typical traditional and Sustainable Drainage Systems (SuDS) to be provided, all of which will be designed in accordance with CIRIA C753, the SuDS Manual, and the design guidance material listed in *Section 2* of this report, are listed and detailed in order of general sequence within the drainage network, as follows:

3.5.3.1 Pervious Pavement

Pervious pavements provide a pavement finish suitable for both pedestrian and vehicular traffic, while also allowing rainwater to infiltrate the surface layer and into the underlying pervious structural layers. Here, the rainwater is temporarily stored beneath the overlying finished surface before either infiltration to the ground or / and controlled discharge to the main surface water drainage network.

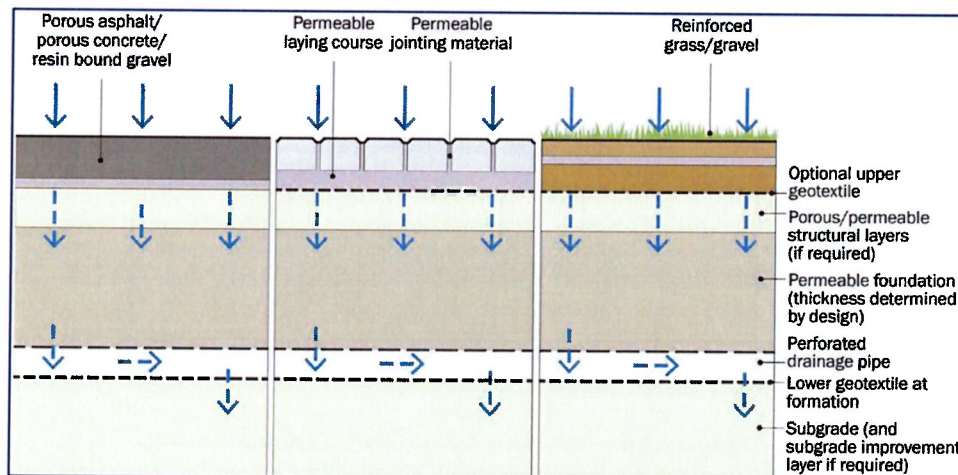


Figure 3.5 - Detail of Type B Pervious Paving (CIRIA C753)

Pervious paving systems are an efficient means of treating the rainwater at source by providing initial interception of the rainwater, reducing the volume and frequency of the runoff and improving the surface water quality by providing at source treatment of the rainfall runoff leaving the site. This is achieved by helping remove and retain pollutants prior to discharge to the drainage system and / or groundwater system.

A **Type B** pervious paving, with a minimum 300mm depth of open graded crushed rock as sub-base course, is to be provided in the car park area. An overflow pipe, from the base-course, will be provided to the drainage network, which will allow for interception of initial rainfall, groundwater discharge, with an attenuated outflow to the main network in extreme rainfall events.

The finished surface of the pervious paving systems is to comprise a *porous asphalt*, or similar approved.

3.5.3.2 Trapped Road Gullies

All road gullies serving the proposed development are to be trapped, to help prevent sediment and gross pollutants from entering the surface water network, and thus improving the water quality discharging from site.

The grated covers are to have a minimum load classification of D400, for frequent vehicular traffic, and shall be lockable, as required by MCC, with 150mm outlet pipes.

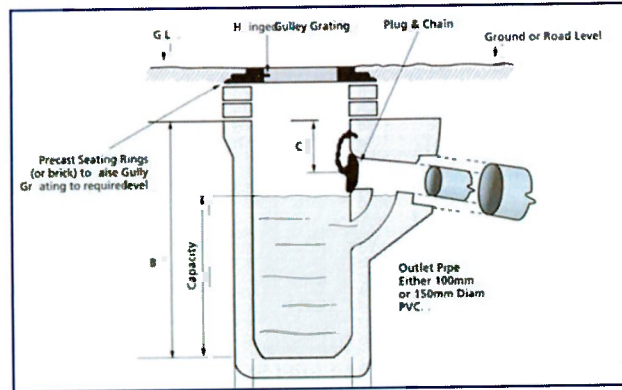


Figure 3.6 - Trapped Road Gully (Typical Detail)

3.5.33 Underground Pipe Network

A traditional gravity pipe and manhole network will be provided, to convey the collected rainfall runoff as far as the development's outfall. Manholes are provided for maintenance access at branched connections, change in pipe size and gradient, and at intervals no greater than 90m distance.

3.5.3.4 Silt Traps

All manholes upstream of attenuation systems are to contain a 600mm sump, below invert level of outlet pipe, in order to trap sediment and other gross pollutants, and prevent from entering the downstream watercourse; thus, improving the water quality discharging from site.

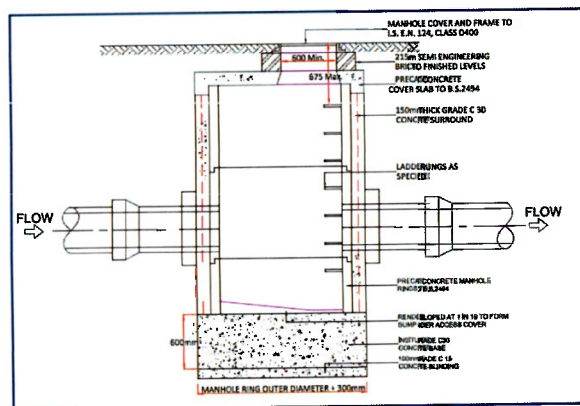


Figure 37 - Typical Detail of Silt Trap Manhole

3.5.3.5 Attenuation Storage Systems

Unlined proprietary poly-tunnel storage units (or similar approved) are to be provided, underground in the car park area, for the attenuation of rainfall runoff prior to discharge to the existing ditch at the eastern site boundary.

These systems are to provide sufficient temporary storage volume for rainfall events up to, and including, the design 1% AEP rainfall event (including climate change). Typical poly-tunnel storage systems comprise plastic arch-units with open-graded crushed rock bedding and surround. These units are arranged in rows, with an isolator row for efficient operation and maintenance.

These systems also allow for interception of initial rainfall to be provided at the base of the system, by elevating the outlet relative to the systems base.

A minimum total polytunnel storage volume of **877 m³** is required as part of the proposed development.

The attenuation systems are to be installed in the parking area and the design was calculated to support the natural greenfield runoff rate, with the development discharge rate being restricted to a maximum flow rate less than the calculated greenfield runoff rate.

Interception storage for the first 10mm rainfall is to be provided. Volume required is 170 m³.



Figure 3.8 – Typical Poly-Tunnel Installation Arrangement

3.5.3.6 Flow Control Device

Flow Control device is to be provided immediately downstream of the attenuation system, in order to restrict the surface water discharge from site to a flow rate equivalent, or below, the natural greenfield runoff rate.

It is proposed to provide the Hydro-brake optimum vortex flow control unit (or similar approved by MCC), downstream of the attenuation systems.

Further, it is noted that the required aperture of the proposed Hydro-Brake outlets have been designed to be greater than 150mm diameter, to mitigate the risk of blockage.

Each flow control chamber is to be fitted with a penstock valve at the inlet and a bypass lever at the outlet (if required), to allow for easy access and maintenance.

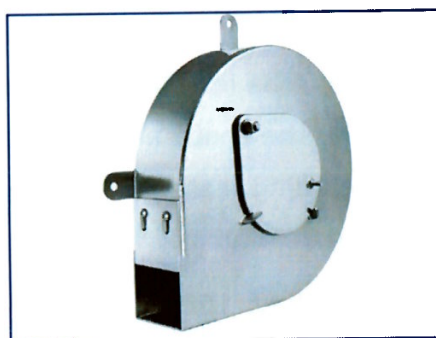


Figure 3.9 - Vortex Hydro-Brake Flow Control Unit (Hydro International)

3.5.3.7 Oil Separator

Oil separators are designed to separate gross amounts of oil and large (>250µm) suspended solids from the surface water, mainly through sedimentation process.

The proposed surface water network already provides sufficient mitigation measures, through the provisions listed previously (principally the pervious paving, filter drains, trapped road gullies and silt traps, and the attenuation interception layer). However, a Class 1 bypass fuel separator is to be provided as an additional and final mitigation measure, prior to surface water discharge to both the network and watercourse.

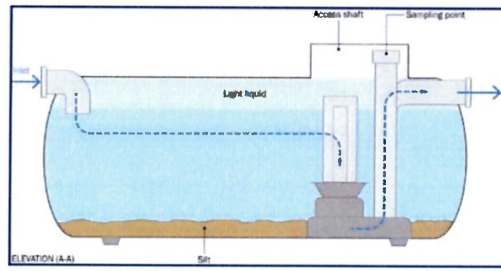


Figure 3.10 - Typical Section Detail of Fuel Separator (CIRIA C753)

3.6 Proposed Surface Water Network Detailed Design

3.6.1 Software Design Criteria

The proposed surface water network is to be designed in accordance with the regulations and guidelines outlined in *Section 2*, using MicroDrainage Network Design package, by Innovyze Inc., which simulates the performance of the integrated drainage network for varying rainfall return periods and storm durations.

The MicroDrainage Network Design software applies the Flood Studies Report (FSR) methodology for analysis of the rainfall profiles. However, the input design parameters that were used, as part of this design, were based on the available Flood Studies Update (FSU) data, *i.e.*, the return period rainfall depths for sliding durations, which determine the **M₅₋₆₀** and **R** values, and the standard annual average rainfall (SAAR); as sourced from Met Éireann.

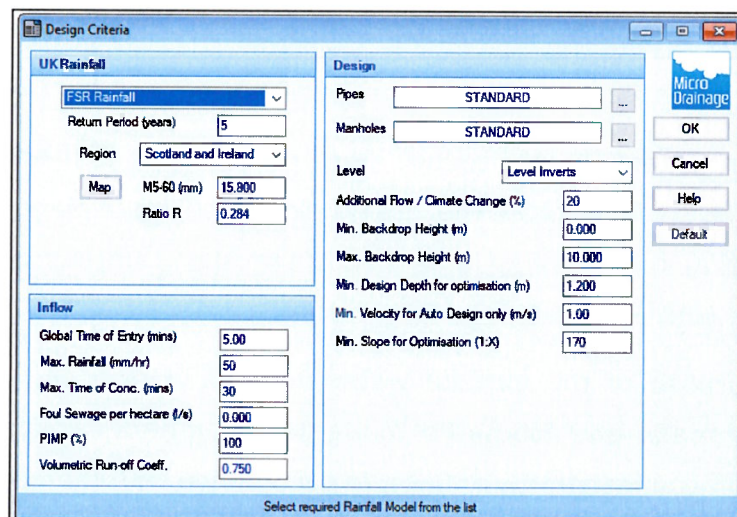


Figure 3.11 - Surface Water Network Design Criteria (MicroDrainage Excerpt)

3.6.2 Proposed Surface Water Catchment Areas

The proposed surface water network is to consist of a single catchment, in order to best integrate Sustainable Drainage Systems. The catchment area will look to provide treatment to the rainfall runoff, either at source or through site design, with all treated rainfall runoff being directed towards the river Ryewater, as is its natural course.

3.6.3 Proposed Development Rainfall Runoff

It is proposed to reduce and restrict the rainfall runoff, discharging from the proposed development, to less than the current greenfield equivalent, $QBAR_{RURAL}$, runoff rate, as per the FSR ICP SuDS method, which is based on the IH124 method for catchments smaller than 25km² in area.

This is to be achieved with the provision of a flow restrictor (Hydro-Brake Optimum by Hydro-International, or similar approved) prior to discharging to the existing watercourse at the south eastern corner of the site, with the appropriate measures of attenuation provided. Sub-catchment flow-control devices and associated attenuation are also to be strategically provided, in order to maximise SuDS benefits and avail of the central open space for preliminary attenuation.

Refer to **Figure 3.4**, in *Section 3.4.3*, for an excerpt from the results MicroDrainage Runoff Calculator for the development catchment area, which indicates the greenfield equivalent, $QBAR_{RURAL} = 5.61$ l/s/ha, along with the calculated runoff for varying Average Recurrence Intervals (ARI).

The design intent is to reduce the rainfall runoff from the proposed development to **less than** the greenfield runoff equivalent to **5.5 l/s/ha**; thus, resulting in no adverse impact on the receiving watercourse, as discussed and agreed with MCC Drainage Department.

For the purpose of the surface water network design simulation, we have considered roads and footpaths to be 100% impermeable; giving a winter global runoff coefficient, C_v , of 0.84, in accordance with the HR Wallingford and Modified Rational Method for runoff. The proposed parking spaces are to

comprise pervious paving above a drainage layer base course. A reduced percentage impermeable factor of 70% has been applied for these locations, which conservatively accounts for initial interception from the pervious paving build-up.

3.6.4 Proposed Surface Water Pipe Network Design

The overall surface water drainage system, serving both catchments in the proposed development, is to consist of a gravity sewer network that will convey runoff from the roofs and paved areas to the outfall manhole.

The proposed piped-network has been designed in accordance with BS EN 752 and all new infrastructure is to be compliant with the requirements of the GDSDS and the GDR COP for Drainage Works, with minimum full-bore velocities of 1.0 m/s achieved throughout.

All main surface water carrier pipes have been sized to ensure no surcharging of the proposed drainage network for rainfall events up to, and including, the 1 in 5-year ARI event, with a projected climate change allowance of 20% increase in rainfall intensity, under normal flow conditions.

3.7 Proposed Surface Water Attenuation Storage

Attenuation system are to be provided within the car park area in order to temporarily store excessive rainfall runoff, during significant rainfall events, due to the restricted discharge rates (to less than greenfield equivalent runoff rates) from the development outfalls.

This will be provided initially by provision of pervious paving for car parking areas.

The main development attenuation system will be provided, comprising underground poly-tunnel system, or alternative approved to MCC's satisfaction. These will be designed for provision within the development's car park area, with adequate drainage to maintain functionality.

The polytunnel system shall contain an isolator row, and a high-level 225mm $\varnothing$ overflow distributor pipe.

A minimum total polytunnel storage volume of **877 m³** is required as part of the proposed development.

A layer of interception will also be provided under attenuation systems, in order to promote groundwater recharge during the initial 5 – 10mm rainfall periods, pending results of Site Investigation to confirm groundwater levels.

Interception storage for the first 10mm rainfall is to be provided. Volume required is 170 m³.

3.8 Surface Water Outfall Locations

The development is to discharge the treated and attenuated rainfall runoff to the existing watercourse along its southern boundary, namely the river Ryewater, with discharge to the existing land drains along the eastern boundary, which will be upgraded as part of the road design that includes new filter drains.

The discharge rates are to be restricted to a flow rate of 5.5 l/s/ha, which is less than the greenfield runoff rate equivalent (5.61 l/s/ha), as discussed and agreed with MCC Drainage Department.

The above is to ensure that there is no increase in flow rates and volumes, from the development site, being discharged to the receiving infrastructure and waterbodies; thus, causing no adverse impact on adjoining and other downstream properties.

The outfall to the river Ryewater shall have a non-return valve fitted to the headwall.

3.9 Realignment of the R157 Maynooth – Dunboyne Road

The existing R157 road currently appears to drain to an open ditch, located alongside the northbound carriageway. As part of the realignment and improvement works associated with the construction of the Maynooth Outer Orbital Road, it is proposed to replace the existing ditch with a filter drain, which will receive the runoff from the adjacent road gullies. This will allow for sustainable drainage provisions for this road upgrade, to reflect the current

condition. The new filter drain will be located along the subject development's eastern site boundary, and will also help convey the treated and attenuated development runoff as far as the river Ryewater, with no adverse impact on the river.

3.10 Water Quality

The quality of the surface water discharging from site is to be improved through the following provisions, which are being considered as part of an integrated drainage network, and each of which is discussed in greater detail in *Section 3.5.3*:

- Pervious Paving in the car park area;
- Intensive landscaping, where practical;
- Filter Trenches, where allowable;
- Trapped road gullies on all road carriageways, to trap silt and gross pollutants;
- Silt traps to be provided on manholes immediately upstream of attenuation systems, as a further preventative measure to trap silt and other gross pollutants;
- Interception provisions at attenuation systems;
- Class 1 bypass fuel separator to be provided prior to discharging from site.
- Upgrade of existing ditch along eastern boundary, to include new filter drains.

3.11 Maintenance

The proposed surface water drainage network is to be carefully designed to minimise risk of blockage throughout the network, mainly through the following provisions that limit and restrict the size of pollutants entering the network:

- Pervious paving;
- Trapped road gullies;
- Silt trap manholes;
- Interception at attenuation systems;

- Filter drains.

Road gullies, silt traps, flow control devices and attenuation systems, should be inspected regularly and maintained, as appropriate and in accordance with manufacturer's recommendations and guidelines.

Items such as the flow controls and fuel separators shall be located so as to provide easy vehicular access for inspection and maintenance.

3.12 Surface Water Impact Assessment

The design criteria for the drainage system are established in *GSDSDS-RDP Volume 2, Section 6.3.4* and explained further in *GSDSDS-RDP Volume 2, Appendix E*. There are four design criteria, each of which has been considered for the subject site:

- River Water Quality Protection;
- River Regime Protection;
- Level of Service (flooding) for the site and;
- River Flood Protection.

3.12.1 Criterion 1 – River Water Quality Protection

It is proposed that the overall drainage system, serving this development, will contain a range of surface water treatment methods, as outlined previously in *Section 3.5.3*, which will improve the quality of surface water being discharged from the proposed development.

Gross pollutants, sediments, hydrocarbons, and other impurities, will be removed at source with the following provisions:

- a) Intensive landscaping, where practicable;
- b) Pervious paving for car parking zones;
- c) Interception storage at attenuation systems;
- d) All road gullies and linear channel drains are to be trapped;
- e) Silt-trap prior to attenuation storage area.

3.12.2 Criterion 2 – River Regime Protection

Surface water discharge from the overall development will be restricted to a maximum flow rate of **5.5 l/s/ha**, which is less than the greenfield runoff equivalent. Refer to *Section 3.6.3* for further details of the proposed development rainfall runoff calculations, as discussed and agreed with MCC Drainage Department.

This will be achieved with the provision of a flow control devices (Hydro-Brake Optimum, by Hydro-International, or similar approved) upstream of the outfall manhole.

3.12.3 Criterion 3 – Level of Service (Flooding) Site

There are four sub-criteria for the required level of service, for a new development; as set out in the *GDSDS Volume 2, Section 6.3.4 (Table 6.3)*.

- No flooding on site except where planned (30-year high intensity rainfall event);
- No internal property flooding (100-year high intensity rainfall event);
- No internal property flooding (100-year river event and critical duration for site) and;
- No flood routing off site except where specifically planned. (100-year high intensity rainfall event).

3.12.3.1 Sub-Criterion 3.1

The surface water drainage systems, serving the proposed development, are yet to be designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding. Therefore, the system has capacity for the 30-year return period rainfall event without flooding.

The performance of the proposed drainage system is yet to be analysed for design rainfall events up to, and including, the 1% AEP event (including 20% climate change allowance) using the *MicroDrainage Network Design Software*, by Innovyze Inc. Refer to **Appendix C** of this ESR for details of design criteria, calculations and results. The analyses indicate that no

flooding will occur for design rainfall events up to, and including, the 1% AEP.

3.12.3.2 Sub-Criterion 3.2

The surface water drainage systems, serving the proposed development, are yet to be designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding.

The performance of the proposed drainage system in 100-year return period storm events (including 20% climate change allowance) is yet to be analysed – Refer **Appendix C** of this ESR for calculations. The analyses show that no flooding will occur in 100-year return period storm events.

3.12.3.3 Sub-Criterion 3.3

Details of the flood risk assessment associated with the proposed development is outlined in the Site-Specific Flood Risk Assessment (Document Nr. **S665-OCSC-1B-XX-RP-C-0010**), which is to be submitted under separate cover, as part of this application.

Furthermore, a detailed Flood Risk Assessment of the river Ryewater has been prepared by JBA Consulting, and submitted under separate cover, which assesses potential impact from development across the Applicant's wider land-holding, which makes up the masterplan area of Maynooth Environs.

These documents confirm that there is no adverse flood risk impact on the subject development, and no adverse flood risk as a result of the subject development.

3.12.3.4 Sub-Criterion 3.4

The surface water drainage systems, serving the proposed development, are designed to accommodate the 100-year return period rainfall event (including an allowance of 20% increase in rainfall intensity for climate change) without flooding, so no flood routing off site will be experienced for such a rainfall event.

The performance of the proposed drainage system in 100-year return period storm events (including 20% climate change allowance) is analysed – Refer **Appendix C** of this ESR for calculations. The analyses show that no flooding will occur in 100-year return period storm events.

Details of the flood risk assessment associated with the proposed development is outlined in the Site-Specific Flood Risk Assessment (Document Nr. **S665-OCSC-1B-XX-RP-C-0010**), which is submitted under separate cover, as part of this application.

3.12.4 Criterion 4 – River Flood Protection

As outlined in *Section 3.12.2* (Criterion 2), the surface water runoff from the development's catchment will be limited to a maximum of **5.5 l/s/ha**, which is less than the calculated greenfield equivalent.

Refer to *Section 3.6.3.* of this report for further details on the limiting discharge rates. The *GDSDS Volume 2, Appendix E* states that this practice ensures "*that sufficient stormwater runoff retention is achieved to protect the river during extreme events*".

Attenuation storage is to be provided for the 100-year return period rainfall event (including an increased 20% rainfall intensity; to allow for climate change). Discharge from site is to be achieved through the use of a vortex flow control device (e.g., Hydro-Brake Optimum, by Hydro-International, or similar approved), which will reduce the risk of blockage present with other flow devices.

Refer to **Appendix C** of this ESR for details of hydraulic modelling calculations of attenuation and flow control facilities, as carried out using MicroDrainage software by Innovyze Inc.

3.13 Taking in Charge

It is proposed that all of the new surface water infrastructure within the access road, **is** to be offered to be taken in charge by Meath County Council. Surface water infrastructure serving the Nursing Home, PCC, internal road, footpaths and parking spaces, **is not** to be offered to be taken in charge by Meath County

Council (refer to Figure 3.12), as these areas will be transferred to a management company that will take responsibility for management, inspection and maintenance.

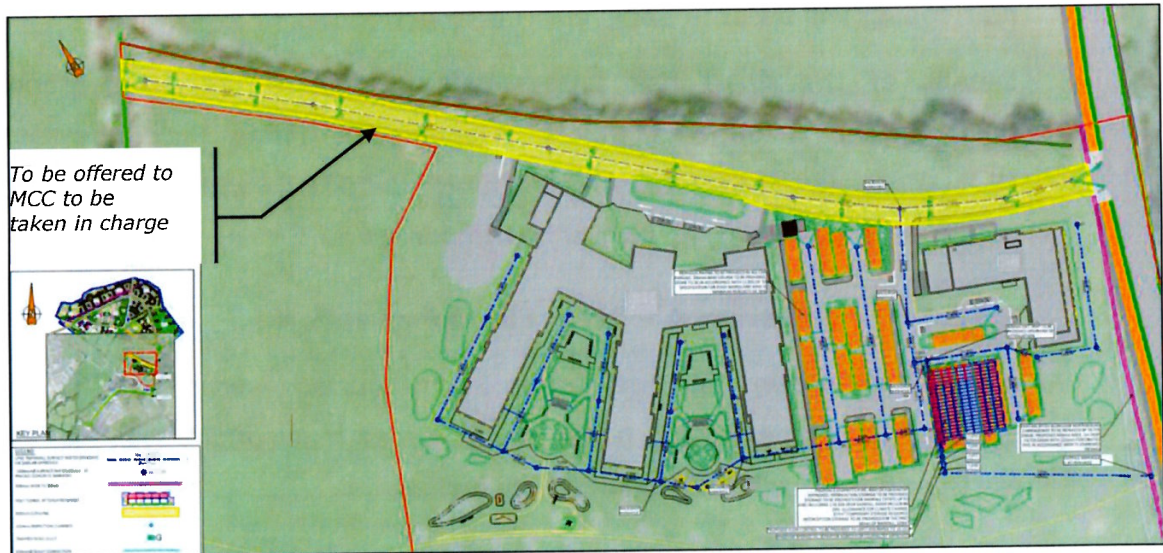


Figure 3.12 - Surface Water Network Design Layout

4 NEW PEDESTRIAN / CYCLE BRIDGE STRUCTURE

There will be a new pedestrian / cycle bridge structure provided at the Kildare Bridge, in order to improve connectivity between the proposed development and Maynooth.

The new pedestrian/cycle bridge, which is to be located adjacent, and west of, to the existing Kildare Bridge will be formed of precast concrete beams sitting on an integral abutment bank seat. The clear span of the bridge is 17m between abutments, uninterrupted across the existing Kildare Bridge's arches. A 1m bearing length is provided at each end, resulting in a 19m long precast MY7 beam. A concrete infill is to be placed in between and over the top of the beams to complete the full depth of the deck, measuring 725mm.

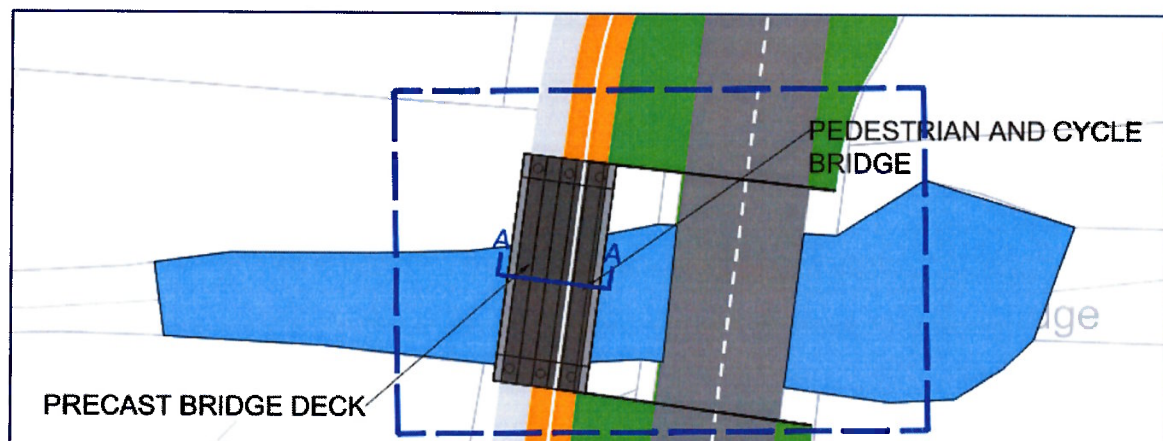


Figure 4.1 - Schematic Plan of new Pedestrian and Cycle Bridge Structure

The soffit of the precast beams matches the crown of the intrados of the adjacent masonry arch road bridge. The abutments are built-up on the existing embankments and sit outside the existing walled banks of the watercourse so as not to affect the current flood catchment area. There is no skew on the bridge deck.

A pedestrian parapet forms the edge of the bridge deck.

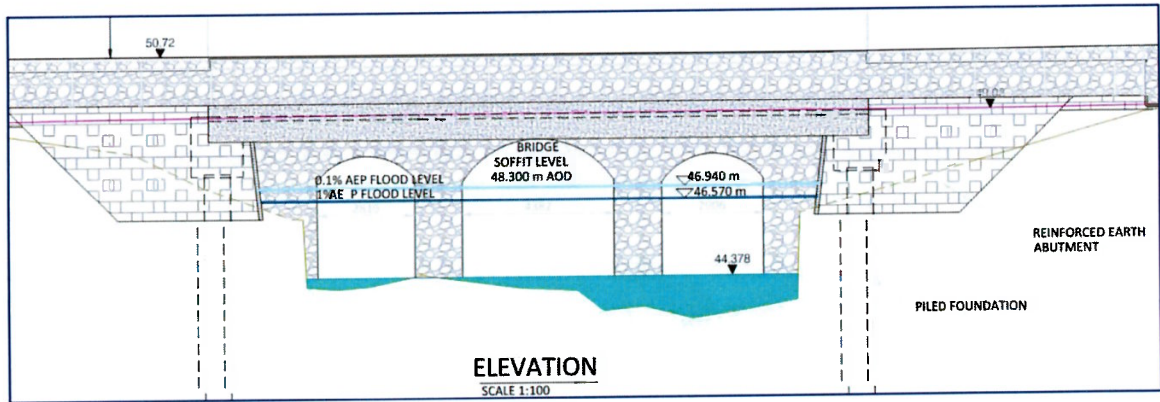


Figure 4.2 - Proposed Pedestrian / Cycle Bridge (Elevation)

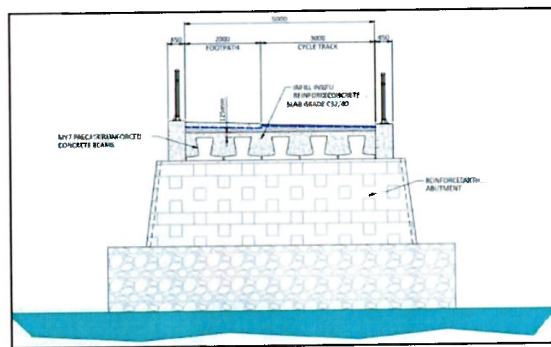


Figure 4.3 - Proposed Pedestrian / Cycle Bridge (Section)

The abutment bank seats are supported off a single row of 750mm diameter CFA piles. The connection between the precast bridge beams and the abutment is integral. To minimise maintenance, no bearings or expansion joints are required. The abutment will be finished with earthwork retaining panels on all sides.

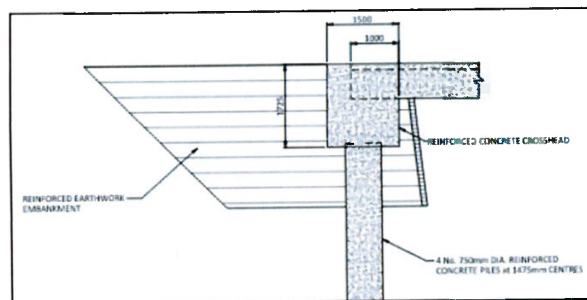


Figure 4.4 - Proposed Pedestrian / Cycle Bridge (Integral Abutments)

The surfacing material consists of a mortar build-up to drainage falls, a waterproofing course and an anti-slip wearing course, Eliminator and Safetrack SC or similar approved.

There are no proposed services in the bridge deck. However, further to our discussions with Irish Water, we understand that they are to tunnel underneath the river Ryewater's bed, in order to install a new high pressure wastewater transmission line under the river Ryewater, to the west of the existing bridge. This is located approximately 20m away from the existing bridge structure, and the new pedestrian / cycle structure has been sited in a location that is sufficiently far away from Irish Water's proposed work zone, so as not to cause any impact. An additional wastewater rising main is to be provided, serving new development in the Moygaddy area, and routed alongside the new bridge infrastructure, in order to facilitate routed connection to the existing Maynooth Municipal Wastewater Pumping Station. Refer to Section 6 for further information.

Durability to the bridge structure is provided by the concrete cover and the concrete mix design in accordance with IS EN 1992 and DN-STR-03012-03. All steel elements including fixings are to be fully galvanised.

Refer to engineering design drawings S665-OCSC-XX-XX-DR-S-1707 & 1708 for design information. Refer to OCSC Bridge Options Report, S665-OCSC-XX-XX-RP-C-0010, submitted separately to this ESR, for detailed discussion on the proposed bridges.

Furthermore, due to the single span nature of construction, there will be no increased risk of blockage to the Kildare Bridge once the cycleway / pedestrian bridge has been installed.

As a precautionary design measure, the potential impact of the proposed pedestrian / cycle bridge structure was further assessed by JBA Consulting, as part of a wider flood study of the Moygaddy Environs, with the conclusions from JBA indicating that the proposed bridge structure has *'no impact on flood following its construction'*.

Refer to JBA Consulting's Masterplan Flood Risk Assessment for further details.

5 WASTE WATER DRAINAGE

5.1 Overview

All proposed wastewater sewer design is to be carried out in accordance with Irish Water's Code of Practice for Wastewater Infrastructure. The existing site is currently greenfield, with no existing wastewater infrastructure in the immediate vicinity, however appropriate connection points have been identified at Maynooth municipal wastewater pumping station, in county Kildare, south of the river Ryewater/Kildare Bridge.

5.2 Consultation

A Pre-Connection Enquiry Form has been submitted to Irish Water for review, for both the proposed development, as well as for the Applicant's wider land holding, which forms part of the masterplan development for the Maynooth Environs lands. Irish Water (IW) issued a Confirmation of Feasibility Letter (Refer Appendix D) for the proposed development, subject to upgrade works being carried out.

OCSC and the applicant have had continued correspondence and meetings with Irish Water with respect to required upgrade works, and have committed to working with Irish Water in order to provide a strategic Wastewater Pumping Station (WWPS) within the applicant owned lands, at Moygaddy. The provision of strategic WWPS, centralised on the Maynooth Environs lands, will allow for new development in this area to be served by wastewater infrastructure, and subsequently allow expansion in order to serve the entire Maynooth Environs lands, as future phasing of development is brought on board.

The strategy of providing a WWPS, as noted, includes provision of rising main infrastructure to specifically serve the subject development, and the pipe will be routed along the Dunboyne Road, and routed across (under) the river Ryewater, adjacent to the Kildare Bridge, so that a connection to the gravity infrastructure upstream of the Maynooth municipal WWPS can be achieved.

Further consultation between the Applicant and Irish Water has been had in relation to Irish Water's Capital Project, which is for the provision of new high

pressure rising main infrastructure to serve Maynooth Town from the Maynooth municipal WWPS, as far as Leixlip wastewater treatment plant. These ongoing works are to greatly improve the performance and capacity of the municipal WWPS, with a section of the new pipeline infrastructure to be provided in Applicant-owned lands. This is discussed further in *Section 5.4*.

5.3 Existing Wastewater Drainage

There is currently no existing wastewater infrastructure in the immediate vicinity of the site. The nearest public wastewater infrastructure is Maynooth's public Wastewater Pumping Station (WWPS).

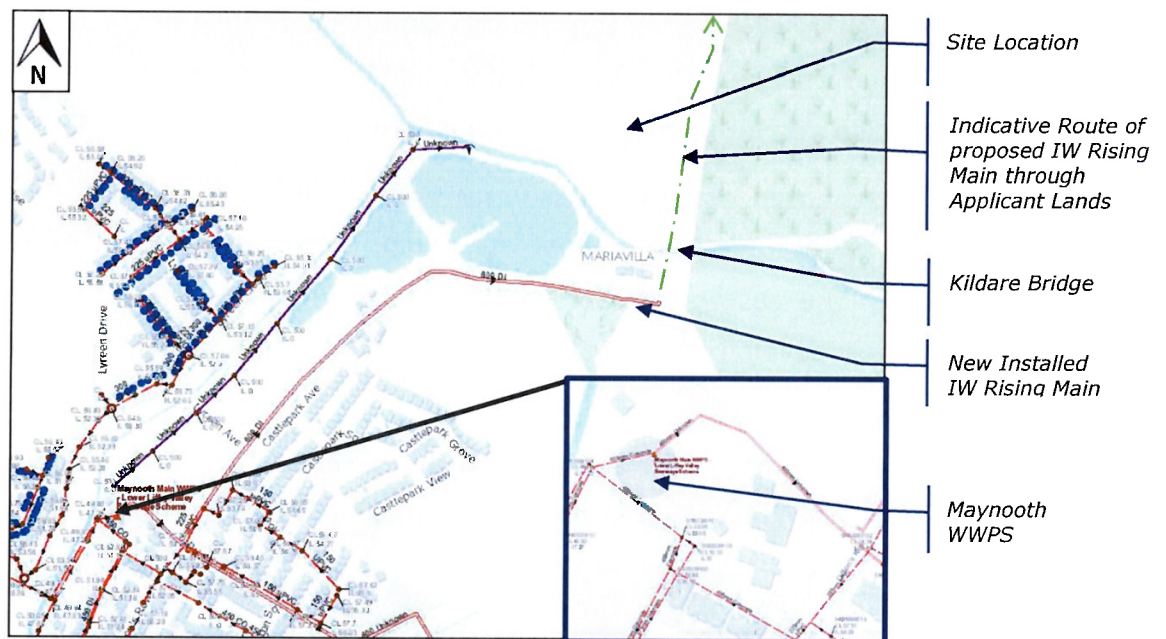


Figure 5.1 –Existing Wastewater Network and Maynooth WWPS

It is noted that Irish Water have separate designs in place to install a high pressure rising main from the existing public WWPS at Maynooth, to the Leixlip Wastewater Treatment Plant, in order to significantly increase the capacity and performance of the Maynooth WWPS.

The route of this new Irish Water infrastructure is to align with the eastern boundary of the subject site, and discussions are ongoing between the applicant, Irish Water and the Local Authorities to ensure that this new

strategic infrastructure can be delivered by Irish Water in conjunction with the wider masterplan for Maynooth Environs.

Maynooth Town is served by a municipal WWPS, at its eastern extent, which discharges wastewater effluent to Leixlip Wastewater Treatment Plant. There is a gravity wastewater network on the Dunboyne Road, adjacent to the Maynooth WWPS.

5.4 New Irish Water Infrastructure

As part of Irish Water's Strategic Capital Investment Programme, Irish Water are currently undergoing design and construction of a new wastewater rising main that will improve the capacity and performance of the nearby Maynooth public Wastewater Pumping Station, and the associated capacity improvements will also serve the proposed development.

The proposed rising main is to be routed north and east, towards the public Wastewater Treatment Plant at Leixlip, with a section of the route located within the eastern part of the Moygaddy Environ's LAP lands, including this subject development site, which are owned by the Applicant as part of their wider land-holding.

A section of the new wastewater rising main is to be accommodated just inside the eastern boundary of the site, as indicated in **Figure 5.2**.

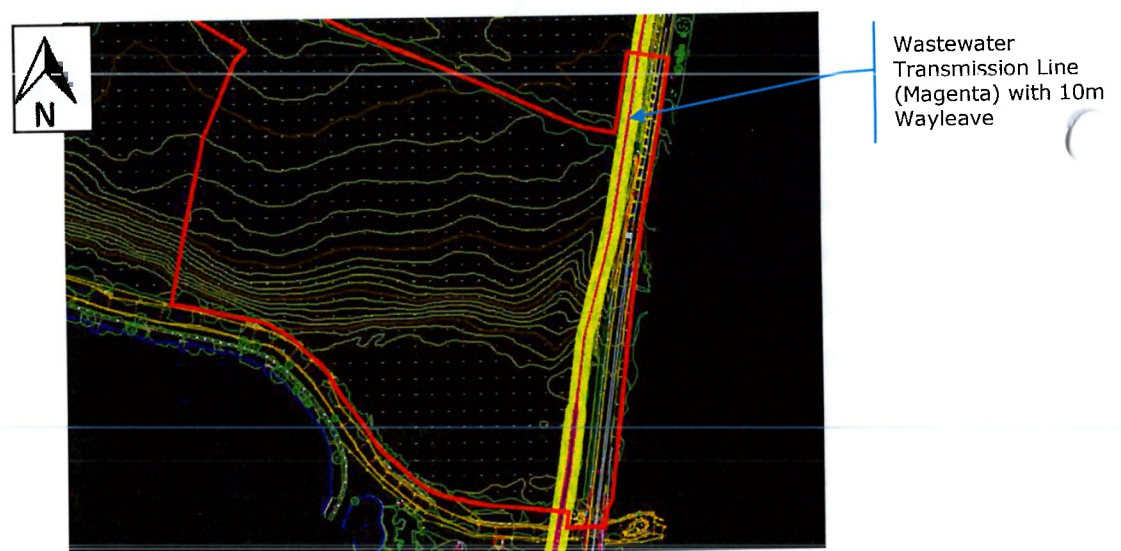


Figure 5.2 - Route of High-Pressure Wastewater Transmission Line

The Developer has been in detailed consultation with Irish Water, for design development of the section of new wastewater rising main, in order to help accommodate the new strategic infrastructure within their lands, and the subject development has been sufficiently set back from the centreline of the rising main route, at a distance greater than the required 5m, so as not to impact on its route and future operation.

5.5 Proposed Wastewater Drainage Strategy

It is proposed to separate the wastewater and surface water drainage networks, which will serve the proposed development independently.

Refer to *Section 3* for details of the proposed surface water drainage design strategy.

Wastewater, within the development, will flow by gravity towards the proposed new wastewater pumping station, which will be located to the west of the nursing home, on the north-western side of the subject site. The proposed wastewater drainage network comprises of a series of 150mm diameter pipes.

All wastewater from the development is to discharge from the new Moygaddy WWPS to the existing Maynooth WWPS located to the south west of the proposed development. This is subject to agreement with Irish Water.

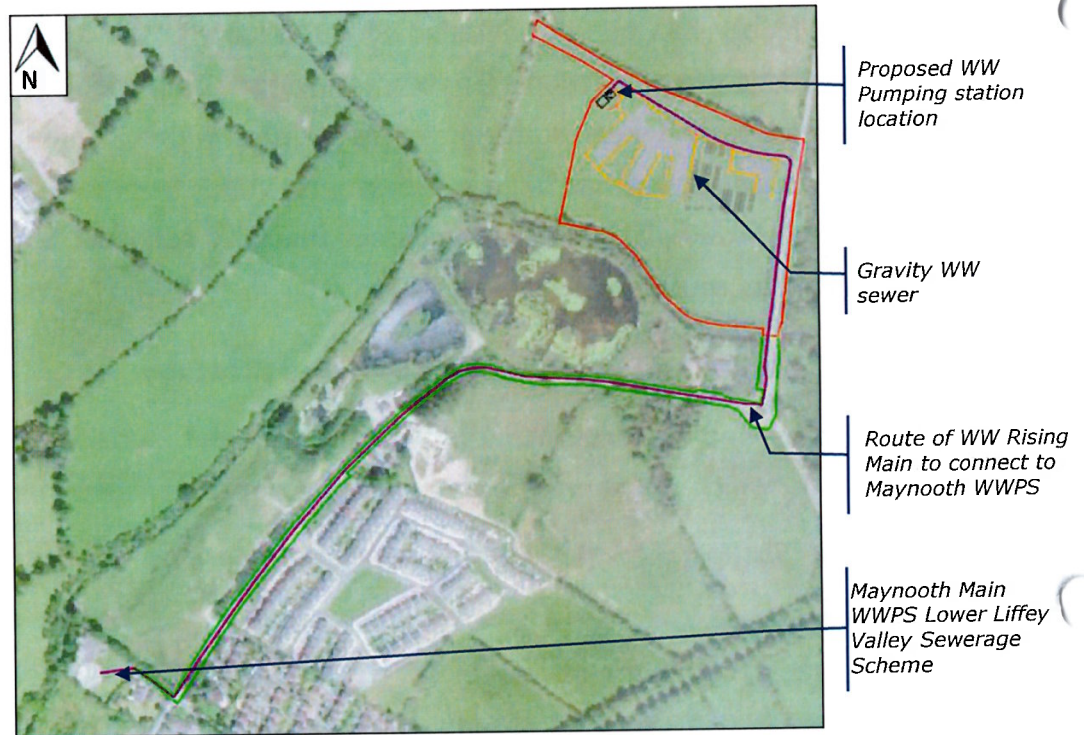


Figure 5.3 –Proposed WW Drainage Layout

The new underground WWPS shall discharge pumped effluent via rising main – with additional rising main laid alongside to accommodate for greater loadings in future phases – as far as the gravity public infrastructure upstream of the Maynooth municipal WWPS. In order to achieve this, the rising main will need to cross the river Ryewater, adjacent to the new pedestrian / cycle bridge structure that is to be constructed adjacent to the Kildare Bridge. It is proposed that this rising main is to be routed under the river Ryewater, alongside the aforementioned new strategic high pressure rising mains that are to be installed by Irish Water to upgrade the Maynooth WWPS.

Refer to **Figure 5.4** for typical detail of a rising main crossing to the west of the Kildare Bridge structure, as per Irish Water Standard Detail Drawing Nr. STD-WW-24, details of which are to be agreed with Irish Water at connection offer stage. The construction methodology proposed is aligned with Irish Water's proposals for the separate Strategic Capital Programme rising main.

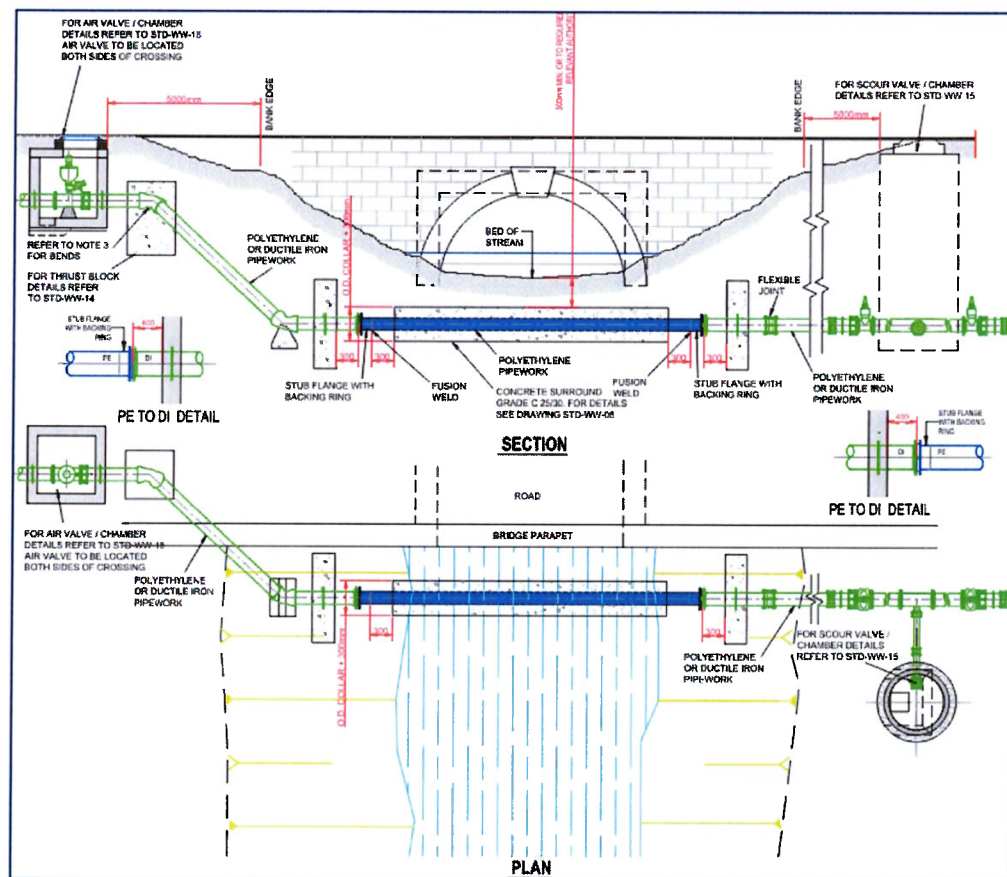


Figure 5.4 - Typical Detail of Rising Main Crossing at Bridge

All infrastructure is to be designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure, and shall be agreed at New Connection Application stage, prior to construction.

Refer to OCSC Bridge Options Report, S665-OCSC-XX-XX-RP-C-0010, submitted separately to this ESR, for detailed discussion on the proposed bridges.

5.6 Proposed Wastewater Pumping Station

The proposed underground wastewater pumping station, which is to be located west from the proposed nursing home, is to take the discharge from the gravity wastewater network of the new development site and transfer it to the Maynooth Municipal Wastewater Pumping Station initially through a 100mm diameter rising main to allow for the initial low flow rates during the early phases of the development, and then through an additional larger rising main

of 150mm diameter to allow for the future phasing of the development in the Moygaddy area.

The route of the proposed twin rising main can be seen in *Figure 5.3*, which is to cross under the river Ryewater, adjacent to the Kildare Bridge, along the Dunboyne Road to the public gravity network upstream of the Maynooth Municipal Wastewater Pumping Station.

The WWPS is to be designed to allow for future expansion as additional development phases are brought through for planning and construction and the details shall be agreed with Irish Water at new connection application stage, as required. The new WWPS and all associated infrastructure shall be provided to Irish Water for taking in charge.

5.7 Taking In Charge

Wastewater infrastructure serving nursing home and PCC, will be offered to be taken in charge by Irish Water. The new wastewater pumping station, and associated infrastructure, is also to be offered to be taken in charge by Irish Water.

6 POTABLE WATER SUPPLY

6.1 Overview

All proposed potable water design has been carried out in accordance with Irish Water's Code of Practice for Water Infrastructure, IW-CDS-5020-03.

6.2 Consultation

A Pre-Connection Enquiry Form has been submitted to Irish Water for review, for both the proposed development, as well as the wider land holding, which forms part of the Maynooth Environs. Irish Water issued a Confirmation of Feasibility Letter (Refer Appendix D of this ESR) for the proposed development, subject to upgrade works being carried out.

OCSC and the applicant have continued correspondence with Irish Water with respect to proposed upgrade works, and have committed to working with Irish Water to resolve all infrastructure works in order to facilitate the proposed development.

6.3 Connection to the Existing Network

There is a 200mm watermain just south from the Kildare bridge, south of the proposed development. An extension from the existing 200mm watermain is to be provided along the MOOR road, to the connection point at the site boundary. It is anticipated that a metered 150mm high density polyethylene connection will be required to serve each building, each of which will have their own individual water meter. Internal distribution network of 150mm HDPE watermain will be provided to serve the proposed nursing home and primary care centre.

The proposed development will be subject to a New Connection Agreement with Irish Water, with all details in accordance with their requirements.

An individual connection agreement will be sought for each of the Primary Care Centre and the Nursing Home, to reflect the fact that they will be operated independently of each other.

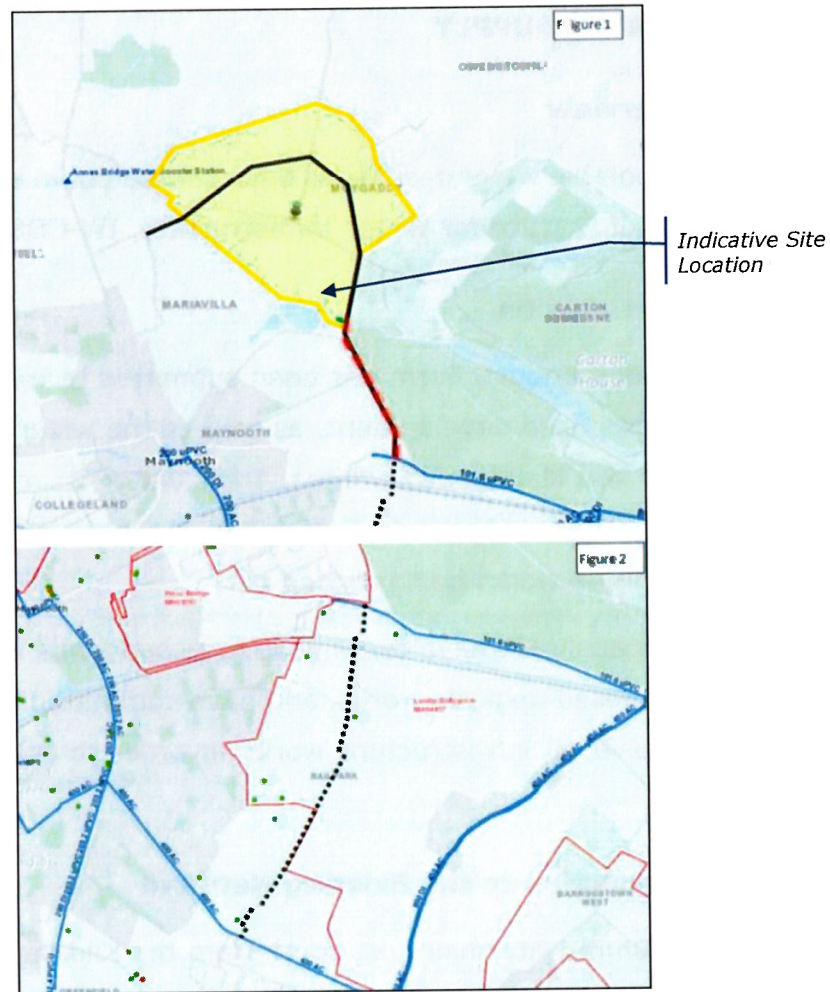


Figure 6.1 – Extract from the CoF

6.4 Water Meters

A bulk water meter is to be provided at the connection to the public watermain, at the development entrance, with individual meters provided at the connection to each of the Primary Care Centre and the Nursing Home. All metering is to be provided in accordance with Irish Water's requirements.

6.5 Taking In Charge

It is proposed new watermain infrastructure within the access road, is to be offered to be taken in charge by Irish Water. Watermain infrastructure serving the Nursing Home and PCC, will be offered to be taken in charge by Irish Water.

7 ROADS AND TRAFFIC

7.6 Design Standards

The proposed development will incorporate a series of design measures, which will be detailed hereinafter, to promote more sustainable modes of transport and support vulnerable road users in line with the core principles of the Design Manual for Urban Roads and Streets (DMURS).

While DMURS is the principle design guideline for the roads elements of this project, the extended list of the main standard documents relied on is:

- National Cycle Manual;
- Traffic Signs Manual 2019;
- DN-PAV-03021: Pavement & Foundation Design;
- GE-STY-01024: Road Safety Audit;
- DN-GEO-03060: Geometric Design of Junctions;
- Traffic Management Guidelines
- NRA IAN 02/11 Interim Requirements for the Use of Eurocodes for the Design of Road Structures Amendment No. 1.

7.7 Proposed Road Network

The proposed development provides for the upgrade of the R157 from Kildare Bridge south of the proposed site to the proposed development entrance along the R157 as well as the creation of new internal access roads and car parking.

A separate application will be made to Kildare County Council for the upgrade of the R157 south of the Kildare bridge. This overlap of applications will ensure unimpeded access to the proposed development lands along the R157 for pedestrian and cyclists.

The upgrade of the proposed section of the R157 will take cognisance of the existing approved Part VIII design by Meath County Council Reference P8/10011, and the strategic plan for the Maynooth Outer Relief Road (MOOR), and will ensure this design implements the latest design standards in agreement with Meath County Council Transportation Section.

The internal road layout and carpark access route will consist of a 6.0m wide carriageway that allows for access to perpendicular parking in line with section 4.4.9 of DMURS. The development will access off a new priority type junction to the R157. The proposed development entrance will take the form of a simple priority T-Junction. This junction was assessed in detail within the final Traffic Impact Assessment.

7.8 Road Classification

The development entrance and internal roads are being designed in accordance with the DMURS, with specific consideration given to the sections including:

- Section 4.3.1 Footways, Verges and Strips
- Section 4.3.2 Pedestrian Crossings
- Section 4.3.3 Corner Radii
- Section 4.3.5 Cycle Facilities
- Section 4.4.1 Carriageway Widths
- Section 4.4.2 Carriageway Surfaces
- Section 4.4.3 Junction Design
- Section 4.4.4 Forward Visibility
- Section 4.4.9 On-Street Parking and Loading

The internal access roads will initially be a cul-de-sac and will be used exclusively by the development and not for local traffic. It is noted, however, that as the masterplan envisages the development of adjoining lands in the future, the carriageway widths in the development have been upsized to cater for occasional larger vehicles and all other design parameters have been chosen under DMURS.

Table 3.1 of DMURS illustrates how this road hierarchy relates to other relevant documents. An extract of DMURS can be seen in *Figure 7.1*, following.

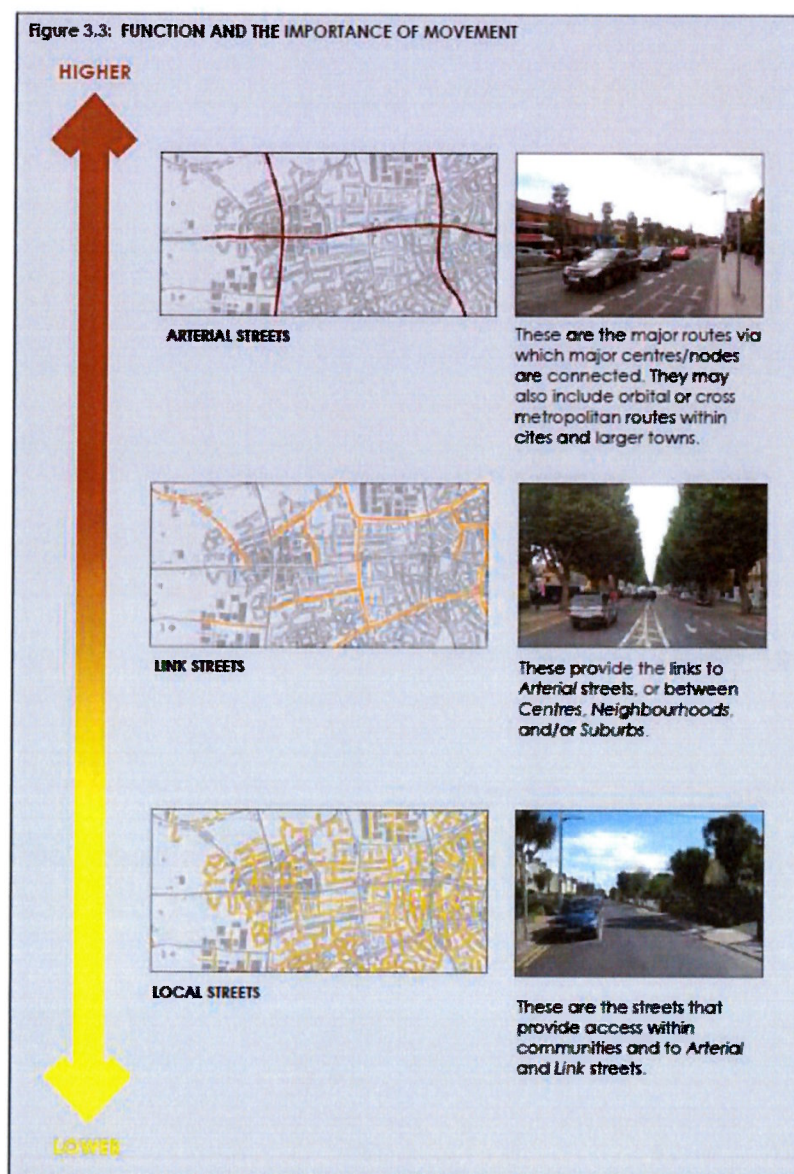


Figure 7.1 – DMURS Street Classification

DMURS Description	Roads Act/NRA DMRB	Traffic Management Guidelines	National Cycle Manual
Arterial	National	Primary Distributor Roads	Distributor
Link	Regional (see note 1)	District Distributor Local Collector (see Notes 1 and 2)	Local Collector
Local	Local	Access	Access

Notes

Note 1: Larger Regional/District Distributors may fall into the category of Arterial where they are the main links between major centres (i.e. towns) or have an orbital function.

Note 2: Local Distributors may fall into the category of Local street where they are relatively short in length and simply link a neighbourhood to the broader street network.

Table 3.1: Terminology used within this Manual compared with other key publications.

Figure 7.2 – DMURS Street Hierarchy

7.9 Road Design Speeds

The internal road has been designed to a Design Speed of 10-30 kph with geometric parameters chosen under DMURS. This is reflected in Table 4.1 below extracted from DMURS

		PEDESTRIAN PRIORITY		VEHICLE PRIORITY		Internal Road
FUNCTION	ARTERIAL	30-40 KM/H	40-50 KM/H	40-50 KM/H	50-60 KM/H	60-80 KM/H
	LINK	30 KM/H	30-50 KM/H	30-50 KM/H	50-60 KM/H	60-80 KM/H
	LOCAL	10-30 KM/H	10-30 KM/H	10-30 KM/H	30-50 KM/H	60 KM/H
	CENTRE		N'HOOD	SUBURBAN	BUSINESS/ INDUSTRIAL	RURAL FRINGE
	CONTEXT					

Table 4.1: Design speed selection matrix indicating the links between place, movement and speed that need to be taken into account in order to achieve effective and balanced design solutions.

Figure 7.3 – DMURS Design Speeds

It is envisaged at this stage that a Design Speed of 50kph will be chosen for the upgrade of the R157 to tie in with the design of the Maynooth Outer Relief Road and the wider strategic road network including the recently approved Maynooth Eastern Ring Road planning reference P82019-08.

7.10 Horizontal and Vertical Geometry

The internal road alignments will be designed so that the geometric elements, including horizontal and vertical curvature, super elevation and sight distance will be in line with DMURS, having values consistent with the design speeds.

The relevant horizontal and vertical geometric design values are shown in DMURS *Table 4.3* below. A standard carriageway cross fall of 2.5% will be adopted throughout with super elevation applied if necessary, noting that adverse camber is allowable under DMURS designs in accordance with *Table 4.3*. A cross fall of 2.5% will also be used for footpaths and cycle facilities.

HORIZONTAL CURVATURE						
Design Speed (km/h)	10	20	30	40	50	60
Minimum Radius with adverse camber of 2.5%	-	11	26	56	104	178
Minimum Radius with superelevation of 2.5%	-	-	-	46	82	136

VERTICAL CURVATURE						
Design Speed (km/h)	10	20	30	40	50	60
Crest Curve K Value	N/A	N/A	N/A	2.6	4.7	8.2
Sag Curve K Value	N/A	N/A	2.3	4.1	6.4	9.2

Table 4.3: Carriageway geometry parameters for horizontal and vertical curvature.

Figure 7.4 – DMURS Geometric Parameters

7.11 Road Cross Section

7.11.5 Carriageway

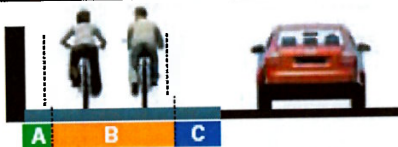
As mentioned previously, the internal road layout will consist of a 6.0m wide carriageway that allows for access to perpendicular parking within the proposed carpark in line with section 4.4.9 of DMURS.

7.11.6 Footpaths

The width of the footpaths has been determined by reference to DMURS *Section 4.3.1* with a minimum required width of 1.8 m based on the space needed for two wheelchairs to pass each other.

7.11.7 Cycle Facilities

The cycle lanes along the R157 will be designed in accordance with the National Cycle Manual (NCM). Based on the Cycle Width Calculator in the NCM the appropriate cycle path width will be 1.75m giving room for a single file lane with overtaking room. The cycle paths will be separated from traffic by a kerb and verge and there will be a vertical separation on the inside, between the cycle path and footpath.



A Inside Edge	B Cycling Regime	C Outside Edge	D Additional Features
Kerb 0.25m	Single File 0.75m	30kph, 3.0m wide lane 0.50m	Uphill 0.25m Sharp bends 0.25m
Channel Gully 0.25m	Single File + Overtaking, Partially using next lane 1.25m	30kph, 3.0m wide lane 0.75m	Cyclist stacking, stopping and starting 0.50m
Wall, Fence or Crash Barrier 0.65m	Basic Two-Way 1.75m	Raised kerb, dropped kerb or physical barrier 0.50m	Around primary schools, roundabouts, after larger tourist bikes 0.25m
Poles or Bollards 0.50m	Single File + Overtaking, Partially using next lane 2.00m	Kerb to vegetation etc. (ie. cycle way) 0.25m	Teddy bears, loading, line of parked cars 1.00m (min 0.8m)
	2 Abreast + overtaking (tracks and cycleways) 2.50m		Turning pocket cyclists 0.50m

Example:
To determine required cycle width, select the appropriate Inside Edge, Cycling Regime, Outside Edge and any Additional Features

Channel Gully 0.25m	Single File + Overtaking, Partially using next lane 1.25m	30kph, 3.0m wide lane 0.75m	Around primary schools, roundabouts, after larger tourist bikes 0.25m
---------------------	---	-----------------------------	---

0.25m
+ 1.25m
+ 0.75m
+ 0.25m
Required width = 2.50m

Note: This is the maximum width for an on road cycle lane. Cycle tracks can be wider.

Figure 7.5 – NCM Width Calculator

7.12 Road Junctions

The development's junction with the R157 has been designed with the primary principle of providing safe and consistent layouts in order to present a uniformity of approach to drivers and other road users. In addition, junctions will have sufficient capacity to accommodate design year peak traffic flows thus optimising network capacity. The primary junction strategy objectives has been:

- To optimise road safety by ensuring adequate visibility and consistency;
- To ensure capacity for the design year;
- To function as traffic calming measures;
- To provide safe crossing facilities for pedestrians and cyclists.

The operation of the junction is assessed using traffic modelling software and is detailed in a standalone Traffic Impact Assessment.

Junctions have been sized and designed to accommodate future elements of the Moygaddy Masterplan.

7.13 Consultation

OCSC have had interactions with Kildare County Council and Meath County Council on this scheme in relation to the transportation related elements of the scheme, as detailed below:

- OCSC met with Meath County Council on 19 July 2021 to open preliminary discussions on the design of the MOOR. In attendance was Martin Murry (Director of Services for Infrastructure) and Nicholas Whyatt (Senior Engineer Transportation). Since this meeting, a Traffic Modelling Scoping Report has been issues to MCC.
- As noted previously, although the scheme is planned within the Meath County Council jurisdiction, a separate application will be made to KCC for infrastructure within the County. It is however noted that as the largest nearby urban centre is within KCC jurisdiction, they have been consulted as a stakeholder. OCSC met with KCC on 9 August 2021, and 23 September 2021. In attendance was Brigette Rea, Daragh Conlan,

George Willoughby, Jonathan Hennessy, and Lisa Kirwan, all from KCC. The same Traffic Modelling Scoping Report has also been issued to KCC.

- A submission was made on the Maynooth Transport Strategy as part of public consultation no. 1 on the 12th of November 2021. This submission outlines the proposed plans for the area and noted that it should be considered as part of the future Transport Strategy.
- A submission was made to BusConnects on the 15th of November 2021 noting the upcoming proposals as part of the MOOR that noted the BusConnects project should take cognisance of the upcoming works.

OCSC received a number of comments from Meath County Council's Transportation Department as part of their Opinion Report. Following this, further workshopping was done on the MOOR. A meeting was held on 14/07/2022 with various stakeholders at MCC, after which a number of comments were received. Subsequent to this, these comments have been incorporated into the design.

Annexure A details the responses to the comments from the Opinion Report, as well as the comments received and addressed as part of the subsequent MOOR design meeting.

7.14 Traffic Impact

A Traffic Impact Assessment was carried out which considers the current traffic flows and capacity in accordance with the Traffic and Transport Assessment Guidelines May 2014 from Transport Infrastructure Ireland. The Traffic Impact Assessment was done by means of Vissim Micro-Simulation software at the request of Kildare County Council. More details of the TIA can be found in the TIA document submitted under separate cover.

7.15 Site Accessibility

The Moygaddy site is located within walking distance of the town centre of Maynooth that is well serviced by a number of existing public transport options.

The proposed site is a 26 minute walk (2.1km) from the existing Maynooth Train Station that provides convenient access along the Dublin Sligo train line that provides intermediate stops at Carrick on Shannon, Longford, Mullingar, Enfield and Drumcondra. The imminent DART+ Programme will also provide higher frequency connections and capacity to the Maynooth line connecting to Dublin Connolly & Dockland stations.



Figure 7.6 – Site Layout

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APPENDIX A. Q_{BAR} Calculation and Rainfall Data

O'Connor Sutton Cronin		Page 1
9 Prussia Street Dublin 7 Ireland	Moygaddy Castle SHD	
Date 23/11/2021 09:40	Designed by RP	
File	Checked by MK	
XP Solutions		Source Control 2020.1

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.470
Area (ha)	1.000	Urban	0.000
SAAR (mm)	799	Region Number	Ireland East

Results 1/s

QBAR Rural 5.6
QBAR Urban 5.6

Q2 years 5.4

Q1 year 4.8
Q30 years 9.2
Q100 years 10.7

Met Eireann

Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 294126, Northing: 239157,

DURATION	Interval		Years														
	6months, 1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,		
5 mins	2.4, 3.4,	4.0,	4.9,	5.4,	5.9,	7.4,	9.2,	10.3,	12.0,	13.4,	14.6,	16.4,	17.8,	18.9,	N/A,		
10 mins	3.3, 4.8,	5.6,	6.8,	7.6,	8.2,	10.3,	12.8,	14.4,	16.7,	18.7,	20.3,	22.8,	24.8,	26.4,	N/A,		
15 mins	3.9, 5.6,	6.5,	8.0,	8.9,	9.7,	12.2,	15.0,	16.9,	19.6,	22.0,	23.9,	26.9,	29.1,	31.0,	N/A,		
30 mins	5.1, 7.3,	8.5,	10.2,	11.4,	12.3,	15.4,	18.8,	21.1,	24.3,	27.2,	29.4,	32.9,	35.6,	37.8,	N/A,		
1 hour	6.8, 9.5,	10.9,	13.1,	14.6,	15.7,	19.4,	23.6,	26.3,	30.2,	33.6,	36.2,	40.3,	43.4,	46.1,	N/A,		
2 hours	9.0, 12.3,	14.1,	16.8,	18.6,	20.0,	24.5,	29.5,	32.8,	37.4,	41.4,	44.6,	49.3,	53.0,	56.1,	N/A,		
3 hours	10.5, 14.4,	16.4,	19.5,	21.5,	23.0,	28.1,	33.7,	37.3,	42.4,	46.9,	50.3,	55.6,	59.6,	63.0,	N/A,		
4 hours	11.8, 16.1,	18.3,	21.6,	23.8,	25.5,	30.9,	37.0,	40.9,	46.4,	51.1,	54.8,	60.5,	64.8,	68.3,	N/A,		
6 hours	13.9, 18.7,	21.3,	25.0,	27.5,	29.4,	35.4,	42.2,	46.5,	52.6,	57.9,	61.9,	68.1,	72.8,	76.7,	N/A,		
9 hours	16.3, 21.9,	24.7,	28.9,	31.7,	33.8,	40.6,	48.1,	52.9,	59.6,	65.4,	69.9,	76.7,	81.9,	86.1,	N/A,		
12 hours	18.3, 24.4,	27.5,	32.1,	35.1,	37.4,	44.8,	52.8,	58.0,	65.2,	71.4,	76.2,	83.4,	88.9,	93.5,	N/A,		
18 hours	21.6, 28.4,	32.0,	37.1,	40.5,	43.1,	51.3,	60.3,	66.0,	73.9,	80.8,	86.0,	93.9,	100.0,	104.9,	N/A,		
24 hours	24.2, 31.7,	35.6,	41.2,	44.9,	47.7,	56.6,	66.2,	72.4,	80.8,	88.2,	93.8,	102.2,	108.6,	113.9,	131.9,		
2 days	30.0, 38.5,	42.7,	48.8,	52.8,	55.8,	65.2,	75.3,	81.7,	90.3,	97.8,	103.4,	111.9,	118.3,	123.5,	141.2,		
3 days	35.0, 44.2,	48.8,	55.3,	59.5,	62.7,	72.6,	83.2,	89.8,	98.8,	106.5,	112.2,	120.9,	127.4,	132.7,	150.5,		
4 days	39.4, 49.2,	54.1,	61.0,	65.5,	68.9,	79.3,	90.3,	97.2,	106.4,	114.3,	120.3,	129.1,	135.8,	141.2,	159.3,		
6 days	47.2, 58.3,	63.7,	71.3,	76.1,	79.8,	91.1,	102.9,	110.2,	120.0,	128.4,	134.6,	143.9,	150.8,	156.4,	175.2,		
8 days	54.3, 66.4,	72.2,	80.4,	85.7,	89.6,	101.6,	114.1,	121.8,	132.2,	140.9,	147.4,	157.1,	164.3,	170.1,	189.5,		
10 days	61.0, 73.9,	80.2,	88.9,	94.4,	98.6,	111.3,	124.4,	132.5,	143.3,	152.4,	159.1,	169.2,	176.6,	182.6,	202.6,		
12 days	67.3, 81.0,	87.6,	96.8,	102.7,	107.0,	120.3,	134.1,	142.5,	153.7,	163.1,	170.1,	180.5,	188.2,	194.4,	214.9,		
16 days	79.1, 94.3,	101.6,	111.7,	118.1,	122.8,	137.2,	152.0,	161.0,	173.0,	183.0,	190.4,	201.4,	209.5,	216.0,	237.6,		
20 days	90.3, 106.8,	114.7,	125.6,	132.4,	137.5,	152.9,	168.5,	178.1,	190.8,	201.3,	209.1,	220.6,	229.1,	235.9,	258.4,		
25 days	103.6, 121.6,	130.2,	141.9,	149.3,	154.7,	171.2,	187.9,	198.1,	211.5,	222.7,	230.9,	243.0,	251.9,	259.1,	282.6,		

NOTES:

N/A Data not available

These values are derived from a Depth Duration Frequency (DDF) Model

For details refer to:

'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

APPENDIX B. Surface Water Design Criteria and Simulation Results



O'Connor Sutton Cronin

9 Prussia Street

Dublin 7

Ireland

PRIMARY CARE CENTRE
AND NURSING HOME

Date 24/08/2022 15:56

File S665-OCSC-1B-MH-M3-C-0001.01.MDX

XP Solutions

Designed by EH

Checked by MK

Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

5

5 Foul Sewage (l/s/ha) 0.000

5	Foul Sewage (l/s/ha)	0.000	Maximum Backdrop Height (m)	10 000
---	----------------------	-------	-----------------------------	--------

00

34
p11

Parameter	Value	Unit
PIMP (%)	100	
Min Vel for Auto Design only	1.00	m/s

508

	Add Flow / Climate Change (%)	Min Slope for Optimisation (1:X)	170
50		20	

30

Minimum Backdrop Height (m)	0.000
30	

Designed with Level Inverts

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
SB1.000	24.053	0.466	51.6	0.121	5.00	0.0	0.600	o	150	Pipe/Conduit		

Network Results Table

[illegible]

O'Connor Sutton Cronin		Page 1
9 Prussia Street Dublin 7 Ireland	PRIMARY CARE CENTRE AND NURSING HOME	
Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX	Designed by EH Checked by MK	
XP Solutions		Network 2020.1.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
SB1.001	39.872	0.235	170.0	0.036	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB1.002	25.646	0.151	170.0	0.005	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB2.000	25.922	0.377	68.8	0.048	5.00	0.0	0.600	o	150	Pipe/Conduit	
SB2.001	27.486	0.478	57.5	0.048	0.00	0.0	0.600	o	150	Pipe/Conduit	
SB1.003	13.169	0.259	50.8	0.009	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB1.004	18.395	0.078	235.8	0.007	0.00	0.0	0.600	o	300	Pipe/Conduit	
SB3.000	23.734	0.653	36.3	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
SB1.001	50.00	5.95	53.042	0.157	0.0	0.0	4.3	1.00	39.8	25.5
SB1.002	50.00	6.38	52.807	0.162	0.0	0.0	4.4	1.00	39.8	26.4
SB2.000	50.00	5.36	53.587	0.048	0.0	0.0	1.3	1.21	21.5	7.8
SB2.001	50.00	5.70	53.210	0.096	0.0	0.0	2.6	1.33	23.5	15.6
SB1.003	50.00	6.50	52.657	0.267	0.0	0.0	7.2	1.84	73.1	43.4
SB1.004	50.00	6.80	52.397	0.274	0.0	0.0	7.4	1.02	72.1	44.5
SB3.000	50.00	5.24	53.487	0.046	0.0	0.0	1.2	1.67	29.6	7.5

O'Connor Sutton Cronin	PRIMARY CARE CENTRE AND NURSING HOME	
9 Prussia Street Dublin 7 Ireland	Designed by EH Checked by MK Network 2020.1.3	
Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX XP Solutions		

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
SB5.000	21.663	0.790	27.4	0.046	5.00	0.0	0.600	o	150	Pipe/Conduit	
SB5.001	22.017	0.790	27.9	0.046	0.00	0.0	0.600	o	150	Pipe/Conduit	
SB1.008	34.047	0.908	37.5	0.007	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB6.000	70.000	2.139	32.7	0.168	5.00	0.0	0.600	o	225	Pipe/Conduit	
SB1.009	16.685	0.201	83.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB7.000	67.004	1.922	34.9	0.095	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	I.Base Flow (l/s)	Foul Flow (l/s)	Add Flow (l/s)	Vel (m/s)	Cap Flow (l/s)
SB5.000	50.00	5.19	53.042	0.046	0.0	0.0	1.2	1.93	34.1
SB5.001	50.00	5.38	52.252	0.092	0.0	0.0	2.5	1.91	33.8
SB1.008	50.00	7.53	51.248	0.597	0.0	0.0	16.2	2.97	327.7
SB6.000	50.00	5.51	52.629	0.168	0.0	0.0	4.5	2.29	91.3
SB1.009	50.00	7.67	50.340	0.765	0.0	0.0	20.7	1.99	219.8
SB7.000	50.00	5.50	52.211	0.095	0.0	0.0	2.6	2.22	88.4

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9 Prussia Street Dublin 7 Ireland	PRIMARY CARE CENTRE AND NURSING HOME		
Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX XP Solutions	Designed by EH Checked by MK Network 2020.1.3		

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
SB1.010	13.805	0.069	200.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB1.011	25.404	0.259	98.0	0.055	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB8.000	60.000	0.353	170.0	0.070	5.00	0.0	0.600	o	225	Pipe/Conduit	
SB8.001	84.563	0.497	170.0	0.080	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB8.002	88.000	0.359	245.0	0.221	0.00	0.0	0.600	o	300	Pipe/Conduit	
SB8.003	37.833	0.643	58.8	0.049	0.00	0.0	0.600	o	300	Pipe/Conduit	
SB9.000	24.262	0.336	72.2	0.041	5.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap Flow (l/s)
SB1.010	50.00	7.85	50.139	0.860	0.0	0.0	23.3	1.28	141.1
SB1.011	49.45	8.08	50.070	0.915	0.0	0.0	24.5	1.83	202.2
SB8.000	50.00	6.00	54.017	0.070	0.0	0.0	1.9	1.00	39.8
SB8.001	50.00	7.41	53.664	0.150	0.0	0.0	4.1	1.00	39.8
SB8.002	47.38	8.88	53.167	0.371	0.0	0.0	9.5	1.00	70.7
SB8.003	46.64	9.18	52.807	0.420	0.0	0.0	10.6	2.05	145.2
SB9.000	50.00	5.26	52.195	0.041	0.0	0.0	1.1	1.54	61.3
									6.7

O'Connor Sutton Cronin		PRIMARY CARE CENTRE AND NURSING HOME		
9 Prussia Street Dublin 7 Ireland				
Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX XP Solutions		Designed by EH Checked by MK Network 2020.1.3		

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HVD SECT (mm)	DIA (mm)	Section Type	Auto Design
SB9.001	37.376	0.220	170.0	0.104	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB8.004	39.874	0.123	325.0	0.031	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB10.000	31.788	0.318	100.0	0.097	5.00	0.0	0.600	o	150	Pipe/Conduit	
SB8.005	12.648	0.039	325.0	0.015	0.00	0.0	0.600	o	375	Pipe/Conduit	
SB1.012	15.620	0.026	590.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul Flow (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
SB9.001	50.00	5.89	51.859	0.145	0.0	0.0	3.9	1.00	39.8	23.6
SB8.004	45.13	9.85	51.639	0.596	0.0	0.0	14.6	1.00	110.4	87.4
SB10.000	50.00	5.53	51.521	0.097	0.0	0.0	2.6	1.01	17.8	15.8
SB8.005	44.68	10.06	49.844	0.708	0.0	0.0	17.1	1.00	110.4	102.8
SB1.012	44.13	10.32	49.805	1.623	0.0	0.0	38.8	1.00	281.4	232.8



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9 Prussia Street Dublin 7 Ireland	PRIMARY CARE CENTRE AND NURSING HOME	
Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX	Designed by EH Checked by MK	
XP Solutions Network 2020.1.3		

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DFA (mm)	Section Type	Auto Design
SB11.000	43.920	0.732	60.0	0.035	5.00	0.0	0.600	o	150	Pipe/Conduit	🚧
SB11.001	21.365	0.214	100.0	0.026	0.00	0.0	0.600	o	150	Pipe/Conduit	🚧
SB11.002	11.708	0.117	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🚧
SB12.000	27.057	0.159	170.0	0.069	5.00	0.0	0.600	o	225	Pipe/Conduit	🚧
SB11.003	17.601	0.104	170.0	0.026	0.00	0.0	0.600	o	225	Pipe/Conduit	🚧
SB1.013	1.082	0.002	590.0	0.014	0.00	0.0	0.600	o	600	Pipe/Conduit	🚧
SB1.014	1.977	0.003	590.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	🚧

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
SB11.000	50.00	5.56	51.502	0.035	0.0	0.0	0.0	0.9	1.30	23.0
SB11.001	50.00	5.92	50.770	0.061	0.0	0.0	0.0	1.7	1.00	17.8
SB11.002	50.00	6.11	50.556	0.061	0.0	0.0	0.0	1.7	1.00	17.8
SB12.000	50.00	5.45	49.985	0.069	0.0	0.0	0.0	1.9	1.00	39.8
SB11.003	50.00	6.40	49.826	0.156	0.0	0.0	0.0	4.2	1.00	39.8
SB1.013	44.09	10.34	48.565	1.794	0.0	0.0	0.0	42.8	1.00	281.4
SB1.014	44.03	10.37	48.563	1.794	0.0	0.0	0.0	42.8	1.00	281.4

O'Connor Sutton Cronin		Page 7	
9 Prussia Street Dublin 7 Ireland Date 24/08/2022 15:56 File S665-OCSC-1B-MH-M3-C-0001.01.MDX XP Solutions	PRIMARY CARE CENTRE AND NURSING HOME		
	Designed by EH		
	Checked by MK		
	Network 2020.1.3		

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
SB1.015	1.270	0.002	590.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
SB1.016	28.561	0.048	590.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
SB1.017	4.100	0.024	170.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
SB1.018	68.026	1.361	50.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Flow (l/s)	Foul Flow (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
SB1.015	43.98	10.39	48.560	1.794	0.0	0.0	42.8	1.00	281.4	257.0
SB1.016	43.03	10.87	48.558	1.794	0.0	0.0	42.8	1.00	281.4	257.0
SB1.017	50.00	5.07	48.509	0.000	10.1	0.0	1.7	1.00	39.8	10.1
SB1.018	50.00	5.68	48.485	0.000	10.1	0.0	2.0	1.85	73.7	12.1

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Area Summary for Storm						
Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.121	0.121	0.121
1.001	-	-	100	0.036	0.036	0.036
1.002 As Zoned		Hardstanding	100	0.005	0.005	0.005
2.000	-	-	100	0.048	0.048	0.048
2.001	-	-	100	0.048	0.048	0.048
1.003 As Zoned		Hardstanding	100	0.011	0.011	0.009
1.004 As Zoned		Hardstanding	100	0.046	0.046	0.007
3.000	-	-	100	0.046	0.046	0.046
3.001	-	-	100	0.046	0.046	0.046
1.005 As Zoned		Default	100	0.010	0.010	0.010
4.000	-	Hardstanding	100	0.009	0.009	0.019
4.001	-	-	100	0.046	0.046	0.046
1.006 As Zoned		Default	100	0.046	0.046	0.046
1.007 As Zoned		Hardstanding	100	0.006	0.006	0.006
5.000	-	Default	100	0.005	0.005	0.011
5.001	-	Default	100	0.006	0.006	0.006
1.008 As Zoned		Hardstanding	100	0.005	0.005	0.011
6.000	-	-	100	0.046	0.046	0.046
1.009	-	Default	100	0.046	0.046	0.046
7.000	-	Hardstanding	100	0.001	0.001	0.001
1.010	-	-	100	0.006	0.006	0.007
1.011	-	-	100	0.168	0.168	0.168
8.000	-	-	100	0.000	0.000	0.000
			100	0.095	0.095	0.095
			100	0.000	0.000	0.000
			100	0.055	0.055	0.055
			100	0.070	0.070	0.070
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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
8.001	-	-	100	0.080	0.080	0.080
8.002	-	-	100	0.221	0.221	0.221
8.003	-	-	100	0.049	0.049	0.049
9.000	-	-	100	0.041	0.041	0.041
9.001	-	-	100	0.104	0.104	0.104
8.004	-	-	100	0.031	0.031	0.031
10.000	-	-	100	0.097	0.097	0.097
8.005	-	-	100	0.015	0.015	0.015
1.012	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.035	0.035	0.035
11.001	-	-	100	0.026	0.026	0.026
11.002	-	-	100	0.000	0.000	0.000
12.000	-	-	100	0.069	0.069	0.069
11.003	-	-	100	0.026	0.026	0.026
1.013 As Zoned	-	Default Road	100	0.004	0.004	0.004
	-	Pervious Paving	70	0.014	0.010	0.014
1.014	-	-	100	0.000	0.000	0.000
1.015	-	-	100	0.000	0.000	0.000
1.016	-	-	100	0.000	0.000	0.000
1.017	-	-	100	0.000	0.000	0.000
1.018	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.839	1.794	1.794

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<u>Free Flowing Outfall Details for Storm</u>					
Outfall Pipe Number	Outfall C. Level (m)	I. Level (m)	Min I. Level (mm) (m)	D/L (mm)	W
SBL.018	48.000	47.125	47.000	0	0
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XP Solutions

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Unit Reference

MD-SHE-0130-1010-2100-1010

Design Head (m)

2.100

Design Flow (l/s)

10.1

Flush-Flo™

Calculated

Objective

Minimise upstream storage

Application

Surface

Sump Available

Yes

Diameter (mm)

130

Invert Level (m)

48.509

Minimum Outlet Pipe Diameter (mm)

150

Suggested Manhole Diameter (mm)

1500

Hydro-Brake® Optimum Manhole: SB-MH42, DS/PN: SB1.017, Volume (m³): 13.0

Online Controls for Storm

Control Points		Head (m)		Flow (l/s)		Control Points		Head (m)		Flow (l/s)	
Design Point (Calculated)		2.100	10.1	Kick-Flo®		1.160	7.6				
Flush-Flo™		0.569	9.6	Mean Flow over Head Range		-	8.6				

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.7	0.600	9.6	1.600	8.9	2.600	11.2	5.000	15.2	7.500	18.5
0.200	8.1	0.800	9.4	1.800	9.4	3.000	11.9	5.500	15.9	8.000	19.1
0.300	9.0	1.000	8.8	2.000	9.9	3.500	12.9	6.000	16.6	8.500	19.6
0.400	9.4	1.200	7.8	2.200	10.3	4.000	13.7	6.500	17.3	9.000	20.2
0.500	9.6	1.400	8.3	2.400	10.7	4.500	14.5	7.000	17.9	9.500	20.7

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<u>Storage Structures for Storm</u>			
Cellular Storage Manhole: SB-MH42, DS/PN: SB1.017			
Invert Level (m) 48.509 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0			
Depth (m) Area (m²) Inf. Area (m²) Depth (m) Area (m²) Inf. Area (m²)	Depth (m) Area (m²) Inf. Area (m²)	Depth (m) Area (m²) Inf. Area (m²)	Depth (m) Area (m²) Inf. Area (m²)
0.000 423.4 0.0	2.100 423.4 0.0	2.101 0.0 0.0	0.0 0.0 0.0
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XP Solutions		Network 2020.1.3																													
Summary of Critical Results by Maximum Level (Rank 1) for Storm																															
Simulation Criteria Areal Reduction Factor 1.000 Manhole Headloss Coeff (Global) 0.500 MADD Factor * 10m³/ha Storage 2.000 Hot Start (mins) 0 Foul Sewage per hectare (l/s) 0.000 Inlet Coefficient 0.800 Hot Start Level (mm) 0 Additional Flow - % of Total Flow 0.000 Flow per Person per Day (l/per/day) 0.000 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR M5-60 (mm) 15.800 Cv (Summer) 0.750 Region Scotland and Ireland Ratio R 0.284 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status OFF Analysis Timestep Fine DVD Status OFF Profile(s) Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080 Return Period(s) (years) Climate Change (%) Summer and Winter 1, 30, 100 20, 20, 20 <table><thead><tr><th>PN</th><th>US/MH Name</th><th>Event</th><th>US/CL (m)</th><th>Water Level (m)</th><th>Surcharged Depth (m)</th><th>Pipe Flow / Cap. (l/s)</th><th>Status</th></tr></thead><tbody><tr><td>SB1.000</td><td>SB-MH1</td><td>15 minute</td><td>100 year</td><td>Winter I+20% 54.408</td><td>54.383</td><td>0.725</td><td>1.42</td><td>33.4</td><td>FLOOD RISK</td></tr><tr><td>SB1.001</td><td>SB-MH2</td><td>15 minute</td><td>100 year</td><td>Winter I+20% 54.467</td><td>53.448</td><td>0.181</td><td>1.10</td><td>41.5</td><td>SURCHARGED</td></tr></tbody></table> ©1982-2020 Innovyze				PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Pipe Flow / Cap. (l/s)	Status	SB1.000	SB-MH1	15 minute	100 year	Winter I+20% 54.408	54.383	0.725	1.42	33.4	FLOOD RISK	SB1.001	SB-MH2	15 minute	100 year	Winter I+20% 54.467	53.448	0.181	1.10	41.5	SURCHARGED
PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Pipe Flow / Cap. (l/s)	Status																								
SB1.000	SB-MH1	15 minute	100 year	Winter I+20% 54.408	54.383	0.725	1.42	33.4	FLOOD RISK																						
SB1.001	SB-MH2	15 minute	100 year	Winter I+20% 54.467	53.448	0.181	1.10	41.5	SURCHARGED																						

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Pipe Flow / Cap. (l/s)	Status
SB1.002	SB-MH3	15 minute 100 year Winter	I+20% 54.580	53.188	0.156	1.11 40.6	SURCHARGED
SB2.000	SB-MH4	15 minute 100 year Winter	I+20% 54.613	53.935	0.198	1.72 14.8	SURCHARGED
SB2.001	SB-MH5	15 minute 100 year Winter	I+20% 54.536	53.743	0.383	1.27 28.4	SURCHARGED
SB1.003	SB-MH6	15 minute 100 year Winter	I+20% 54.428	53.003	0.122	1.08 68.0	SURCHARGED
SB1.004	SB-MH7	15 minute 100 year Winter	I+20% 54.042	52.701	0.004	1.11 69.1	SURCHARGED
SB3.000	SB-MH8	15 minute 100 year Winter	I+20% 54.537	53.636	-0.001	0.58 16.3	OK
SB3.001	SB-MH9	15 minute 100 year Winter	I+20% 54.184	53.433	0.449	1.48 30.4	SURCHARGED
SB1.005	SB-MH10	15 minute 100 year Winter	I+20% 53.819	52.524	-0.095	0.60 101.9	OK
SB4.000	SB-MH11	15 minute 100 year Winter	I+20% 54.495	53.236	-0.059	0.66 17.1	OK
SB4.001	SB-MH12	15 minute 100 year Winter	I+20% 53.931	52.894	0.163	0.99 31.1	SURCHARGED
SB1.006	SB-MH13	15 minute 100 year Winter	I+20% 53.084	52.266	0.382	1.04 132.5	SURCHARGED
SB1.007	SB-MH14	15 minute 100 year Winter	I+20% 52.527	52.018	0.316	1.27 135.4	SURCHARGED
SB5.000	SB-MH15	15 minute 100 year Winter	I+20% 54.392	53.121	-0.071	0.53 17.2	OK
SB5.001	SB-MH16	15 minute 100 year Winter	I+20% 53.706	52.510	0.108	1.03 33.0	SURCHARGED
SB1.008	SB-MH17	15 minute 100 year Winter	I+20% 53.010	51.906	0.283	0.53 154.8	SURCHARGED
SB6.000	SB-MH18	15 minute 100 year Winter	I+20% 54.054	52.771	-0.083	0.70 61.7	OK
SB1.009	SB-MH19	15 minute 100 year Winter	I+20% 51.915	51.659	0.944	1.15 202.2	FLOOD RISK
SB7.000	SB-MH20	15 minute 100 year Winter	I+20% 53.636	52.313	-0.123	0.41 34.9	OK
SB1.010	SB-MH21	15 minute 100 year Winter	I+20% 51.714	51.391	0.878	2.15 230.1	SURCHARGED
SB1.011	SB-MH22	15 minute 100 year Winter	I+20% 51.645	51.045	0.600	1.38 241.5	SURCHARGED
SB8.000	SB-MH23	15 minute 100 year Winter	I+20% 55.442	54.603	0.361	0.56 21.6	SURCHARGED
SB8.001	SB-MH24	15 minute 100 year Winter	I+20% 55.314	54.512	0.623	1.04 40.2	SURCHARGED
SB8.002	SB-MH25	15 minute 100 year Winter	I+20% 55.095	53.973	0.507	1.44 98.1	SURCHARGED
SB8.003	SB-MH26	15 minute 100 year Winter	I+20% 54.244	53.016	-0.092	0.82 109.6	OK
SB9.000	SB-MH27	15 minute 100 year Winter	I+20% 53.620	52.557	0.137	0.25 14.0	SURCHARGED

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Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Pipe Flow / Cap. (l/s)	Status
SB9.001	SB-MH28	15 minute 100 year Winter I+20%	52.984	52.528	0.444	1.20 45.0	SURCHARGED
SB8.004	SB-MH29	15 minute 100 year Winter I+20%	53.365	52.194	0.180	1.61 162.0	SURCHARGED
SB10.000	SB-MH30	15 minute 100 year Winter I+20%	52.871	52.372	0.701	1.78 30.4	SURCHARGED
SB8.005	SB-MH31	15 minute 100 year Winter I+20%	52.936	50.794	0.575	2.38 195.5	SURCHARGED
SB1.012	SB-MH32	720 minute 100 year Winter I+20%	52.828	50.576	0.171	0.44 63.7	SURCHARGED
SB11.000	SB-MH33	15 minute 100 year Winter I+20%	53.340	51.585	-0.067	0.58 12.8	OK
SB11.001	SB-MH34	15 minute 100 year Winter I+20%	52.120	51.088	0.168	1.21 20.3	SURCHARGED
SB11.002	SB-MH35	15 minute 100 year Winter I+20%	52.280	50.766	0.060	1.25 20.1	SURCHARGED
SB12.000	SB-MH36	720 minute 100 year Winter I+20%	51.110	50.577	0.367	0.07 2.7	SURCHARGED
SB11.003	SB-MH37	720 minute 100 year Winter I+20%	52.835	50.576	0.526	0.17 6.1	SURCHARGED
SB1.013	SB-MH38	720 minute 100 year Winter I+20%	52.831	50.575	1.410	0.29 70.1	SURCHARGED
SB1.014	SB-MH39	720 minute 100 year Winter I+20%	52.822	50.575	1.412	0.30 69.9	SURCHARGED
SB1.015	SB-MH40	720 minute 100 year Winter I+20%	52.806	50.574	1.415	0.29 69.6	SURCHARGED
SB1.016	SB-MH41	720 minute 100 year Winter I+20%	52.796	50.574	1.417	0.31 69.3	SURCHARGED
SB1.017	SB-MH42	720 minute 100 year Winter I+20%	51.540	50.572	1.838	0.36 9.9	SURCHARGED
SB1.018	SB-MH43	720 minute 100 year Winter I+20%	50.240	48.541	-0.170	0.14 9.9	OK

APPENDIX C. Wastewater Design Calculation and Network Details

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XP Solutions

PRIMARY CARE CENTRE

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Micro Drainage

FOUL SEWERAGE DESIGN

Design Criteria for Foul Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)

0.00

Industrial Peak Flow Factor

0.00

Calculation Method

BS 8301

Frequency Factor

0.00

Domestic (l/s/ha)

0.00

Domestic Peak Flow Factor

6.00

Add Flow / Climate Change (%)

0

Minimum Backdrop Height (m)

0.200

Maximum Backdrop Height (m)

1.500

Min Design Depth for Optimisation (m)

1.200

Min Vel for Auto Design only (m/s)

0.75

Min Slope for Optimisation (1:X)

500

Designed with Level Inverts

Network Design Table for Foul Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA (mm)	Section Type	Auto Design
WB1.000	45.652	0.761	60.0	0.000	11.0	0.0	1.500	o	150	Pipe/Conduit	💡
WB1.001	57.443	0.427	134.5	0.000	10.0	0.0	1.500	o	150	Pipe/Conduit	🌿

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units (l/s)	Add Flow (mm)	P.Dep (m/s)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
WB1.000	51.881	0.000	0.0	11.0	0.0	35	0.76	1.13	20.0	2.4
WB1.001	51.120	0.000	0.0	21.0	0.0	47	0.59	0.75	13.3	2.8

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Network Design Table for Foul Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA (mm)	Section Type	Auto Design
WB2.000	20.181	0.336	60.0	0.000	7.0	0.0	1.500	o	150	Pipe/Conduit	
WB2.001	33.974	0.252	135.0	0.000	17.0	0.0	1.500	o	150	Pipe/Conduit	
WB2.002	24.019	0.188	127.8	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB1.002	46.886	0.347	135.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB3.000	43.158	0.719	60.0	0.000	48.0	0.0	1.500	o	150	Pipe/Conduit	
WB3.001	38.381	0.471	81.4	0.000	27.0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
WB2.000	51.469	0.000	0.0	7.0	0.0	34	0.74	1.13	20.0	2.2
WB2.001	51.133	0.000	0.0	24.0	0.0	47	0.60	0.75	13.3	2.9
WB2.002	50.881	0.000	0.0	24.0	0.0	47	0.61	0.77	13.7	2.9
WB1.002	50.693	0.000	0.0	45.0	0.0	51	0.62	0.75	13.3	3.3
WB3.000	51.536	0.000	0.0	48.0	0.0	42	0.84	1.13	20.0	3.3
WB3.001	50.817	0.000	0.0	75.0	0.0	47	0.77	0.97	17.2	3.7

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Network Design Table for Foul Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HVD SECT (mm)	DIA (mm)	Section Type	Auto Design
WB1.003	63.440	0.470	135.0	0.000	11.0	0.0	1.500	o	150	Pipe/Conduit	
WB1.004	35.782	0.265	135.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB1.005	17.703	0.140	126.5	0.000	26.0	0.0	1.500	o	150	Pipe/Conduit	
WB4.000	49.297	0.822	60.0	0.000	73.0	0.0	1.500	o	150	Pipe/Conduit	
WB4.001	30.889	0.229	135.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB5.000	29.201	0.658	44.4	0.000	38.0	0.0	1.500	o	150	Pipe/Conduit	
WB5.001	23.965	0.715	33.5	0.000	39.0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
WB1.003	50.346	0.000	0.0	131.0	0.0	58	0.67	0.75	13.3	4.2
WB1.004	49.876	0.000	0.0	131.0	0.0	58	0.67	0.75	13.3	4.2
WB1.005	49.611	0.000	0.0	157.0	0.0	58	0.69	0.78	13.8	4.4
WB4.000	52.881	0.000	0.0	73.0	0.0	44	0.86	1.13	20.0	3.7
WB4.001	52.059	0.000	0.0	73.0	0.0	54	0.64	0.75	13.3	3.7
WB5.000	53.203	0.000	0.0	38.0	0.0	38	0.92	1.32	23.3	3.2
WB5.001	52.545	0.000	0.0	77.0	0.0	38	1.06	1.52	26.8	3.7

O'Connor Sutton Cronin			PRIMARY CARE CENTRE AND NURSING HOME			Page 3				
9 Prussia Street Dublin 7 Ireland			Designed by EH Checked by MK							
Date 24/08/2022 15:57 File S665-OCSC-1B-MH-M3-C-0001.01.MDX XP Solutions			Network 2020.1.3							
Network Design Table for Foul Network 1										
PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA Section Type	Auto Design
WB4.002	25.646	0.190	135.0	0.000	0.0	0.0	1.500	o	150 Pipe/Conduit	
WB6.000	26.968	0.899	30.0	0.000	40.0	0.0	1.500	o	150 Pipe/Conduit	
WB6.001	26.968	0.693	38.9	0.000	40.0	0.0	1.500	o	150 Pipe/Conduit	
WB4.003	12.309	0.091	135.0	0.000	0.0	0.0	1.500	o	150 Pipe/Conduit	
WB4.004	19.794	0.155	127.7	0.000	0.0	0.0	1.500	o	150 Pipe/Conduit	
WB7.000	32.581	1.086	30.0	0.000	40.0	0.0	1.500	o	150 Pipe/Conduit	
WB7.001	24.303	0.810	30.0	0.000	40.0	0.0	1.500	o	150 Pipe/Conduit	
Network Results Table										
PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Val (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
WB4.002	51.830	0.000	0.0	150.0	0.0	59	0.67	0.75	13.3	4.3
WB6.000	53.232	0.000	0.0	40.0	0.0	34	1.06	1.60	28.3	3.2
WB6.001	52.333	0.000	0.0	80.0	0.0	39	1.01	1.41	24.9	3.7
WB4.003	51.640	0.000	0.0	230.0	0.0	63	0.69	0.75	13.3	4.8
WB4.004	51.549	0.000	0.0	230.0	0.0	62	0.71	0.77	13.7	4.8
WB7.000	53.290	0.000	0.0	40.0	0.0	34	1.06	1.60	28.3	3.2
WB7.001	52.204	0.000	0.0	80.0	0.0	37	1.11	1.60	28.3	3.7
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9 Prussia Street

Dublin 7

Ireland

Date 24/08/2022 15:57

File S665-OCSC-1B-MH-M3-C-0001.01.MDX

XP Solutions

PRIMARY CARE CENTRE
AND NURSING HOME

Designed by EH

Checked by MK

Network 2020.1.3



Network Design Table for Foul Network 1

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT (mm)	DIA (mm)	Section Type	Auto Design
WB4.005	25.646	0.427	60.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB4.006	68.237	1.137	60.0	0.000	45.0	0.0	1.500	o	150	Pipe/Conduit	
WB4.007	13.182	0.180	73.2	0.000	45.0	0.0	1.500	o	150	Pipe/Conduit	
WB4.008	13.380	0.178	75.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB1.006	9.217	0.061	150.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
WB1.007	10.000	0.067	150.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
WB4.005	51.394	0.000	0.0	310.0	0.0	53	0.95	1.13	20.0	5.3
WB4.006	50.966	0.000	0.0	355.0	0.0	54	0.96	1.13	20.0	5.5
WB4.007	49.829	0.000	0.0	400.0	0.0	58	0.91	1.02	18.1	5.7
WB4.008	49.649	0.000	0.0	400.0	0.0	58	0.90	1.01	17.9	5.7
WB1.006	49.471	0.000	0.0	557.0	0.0	76	0.72	0.71	12.6	6.4
WB1.007	49.409	0.000	0.0	557.0	0.0	76	0.72	0.71	12.6	6.4

APPENDIX D. Irish Water Correspondence

Mark Killian

9 Prussia Street
Stoneybatter
Dublin 7
D07KT57

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

20 October 2021

Re: CDS21003388 pre-connection enquiry - Subject to contract | Contract denied

Connection for Business Connection of 1 unit(s) at Phase 1C, Moygaddy, Meath

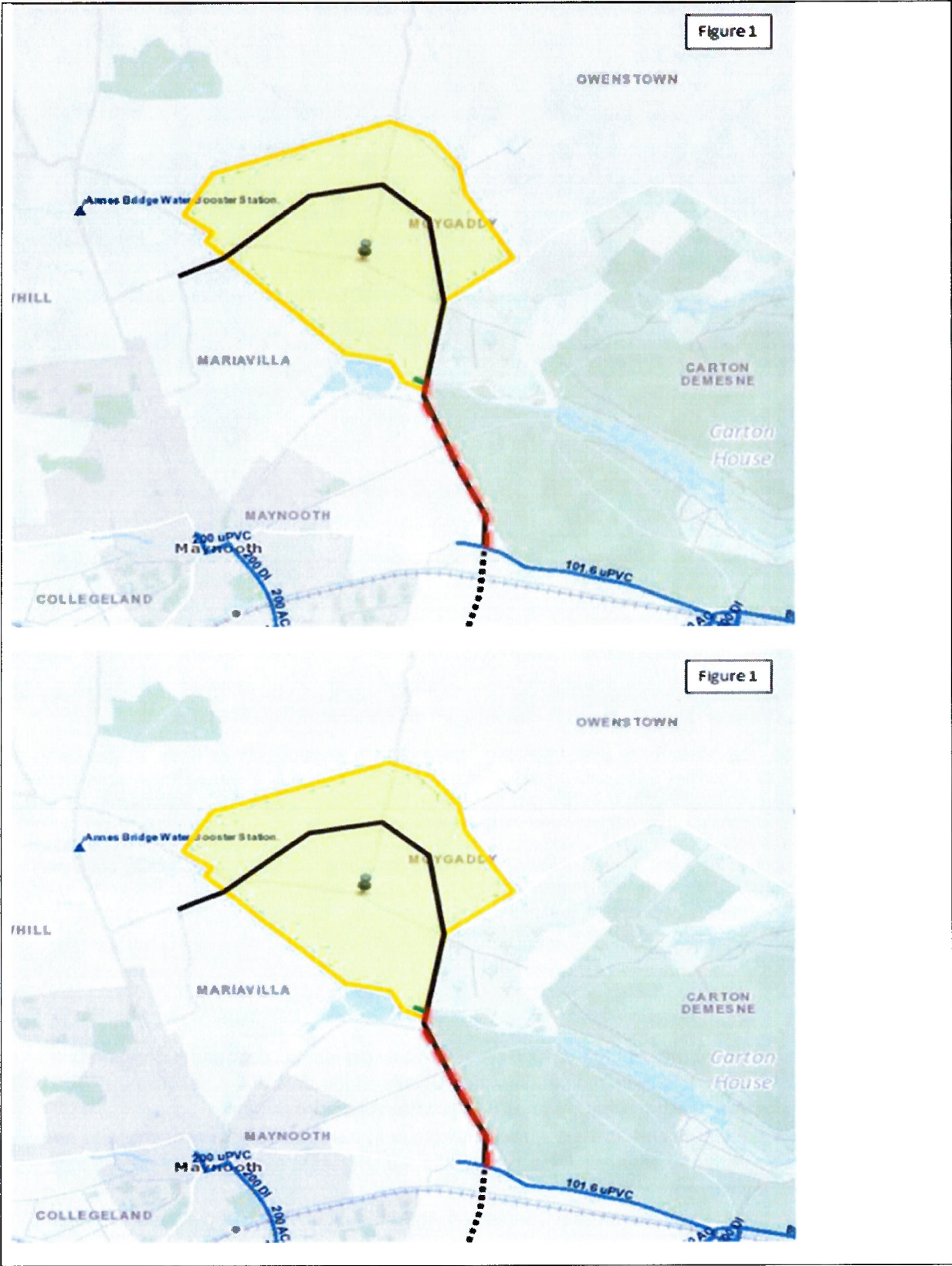
Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Phase 1C, Moygaddy, Meath (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	There are water network capacity constraints in this catchment.
Wastewater Connection	There are wastewater network capacity constraints in this catchment.
SITE SPECIFIC COMMENTS	
Water Connection	In order to accommodate the proposed connection at this development, upgrade works are required to increase the capacity of the Irish Water network. Irish Water does not currently have any plans to carry out the works required to provide the necessary upgrade and capacity. Should you wish to have such upgrade works progressed, Irish Water will require you to provide a contribution of a relevant portion of the costs for the required upgrades, please contact Irish Water to discuss this further. 1. Connection main – Approx. 50m of new 250mm ID main to be laid to connect the site development (see yellow section below) to the new 300mm ID upgrade main. Connection main shown below (See green line in figure 1). 2. Trunk/Distribution main 1 – Approx. 950m of 300mm ID main to be laid to link connection main and new 350mm ID main (see red

	dashed line in figure 1). To service the lands a total of 3500m of 300mm ID main (seen as black line in figure 1) which links in with Mariavilla. 3. Trunk/Distribution main 2 – Approx. 1400m of new 350mm ID main to be laid to link new 300mm ID TM 1 and the existing 400mm AC main together. 4. Onsite storage required for commercial units, 24-hour storage at ADPW demand, storage units must also be able to be refilled from empty within 12-hour period IW currently have a project 'Maynooth East Ring Road' which is currently at design stage and on our current investment plan consisting of approx. 1400m of 350mm ID main (shown below (black dashed line in figure 2) and will be carried out in conjunction with Kildare County Councils 'Maynooth Eastern Ring Road' project.
Wastewater Connection	In order to accommodate the proposed connection at the Premises, upgrade works are required to increase the capacity of the Maynooth Wastewater Pump Station and Rising Main. Irish Water currently has a project on our current investment plan which will provide the necessary upgrade and capacity. This upgrade project is currently scheduled to be completed by Q4 2025 (this may be subject to change, as planning has yet to be granted in both Kildare and Meath and the appropriate consents for the project). The addition discharge would cause a back up of flows in the existing gravity network entering the pump station. Upgrade works would be required to increase the capacity of the wastewater network (upgrade of approx. 175m of network directly upstream of the Pump Station). Irish Water are currently reviewing these works which are not currently on the Capital Investment Plan. Please contact Irish Water to discuss this further. Where a connection is proposed in advance of the delivery of strategic solutions in this area, Irish water are willing to review Storm Sewer Separation proposals (from the combined network) in the Maynooth area, in order to provide additional wastewater capacity. This would require co-operation and agreement from Kildare County Council, as the storm drainage authority. Further measures are currently being investigated by Irish Water in this area via the Capital Maintenance Programme, including: - identifying and repairing areas of infiltration - control of pumping stations in the catchment - increasing local storage in the area
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



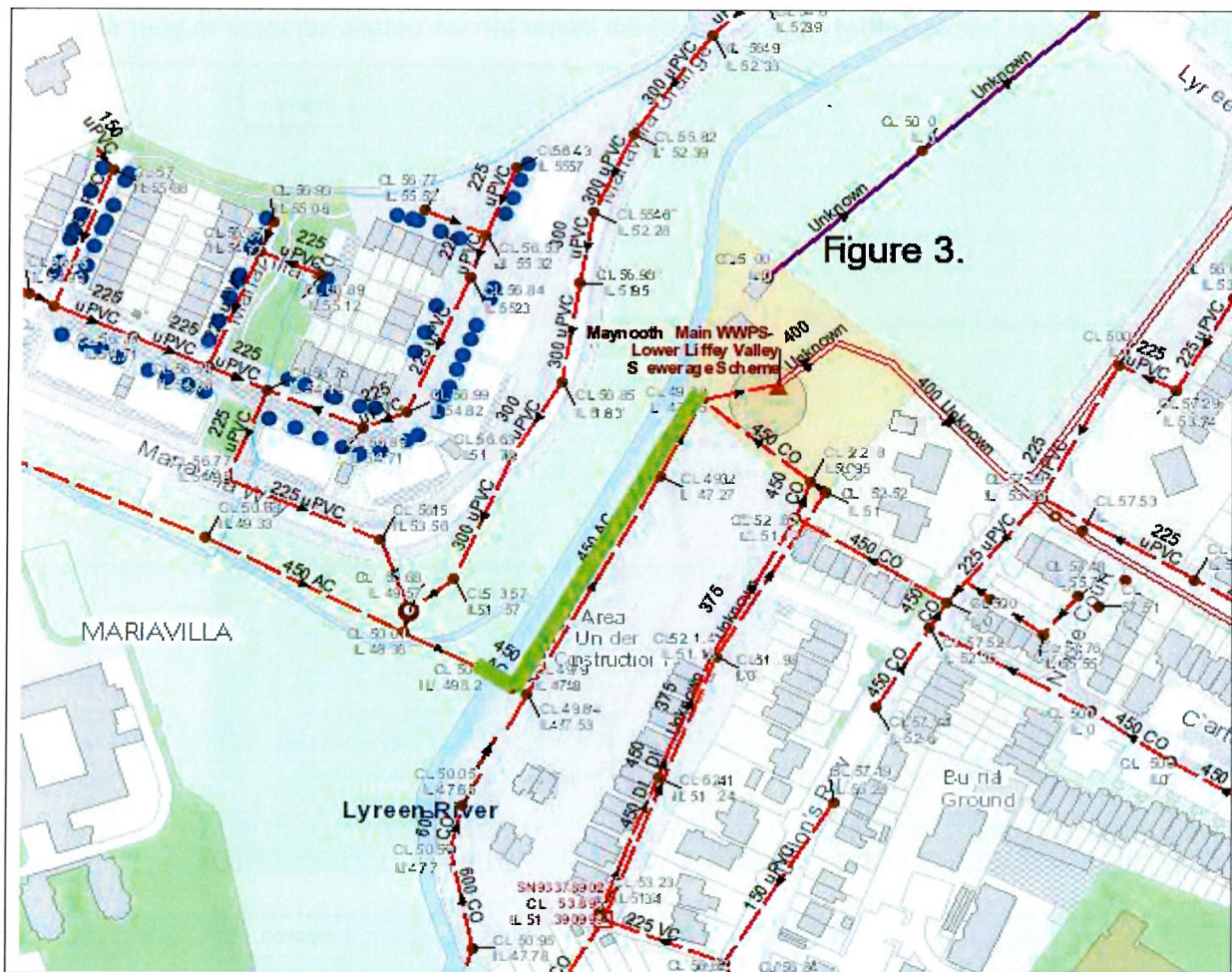


Figure 3.

Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

- 1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
- 2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
- 3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.

- 4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at <https://www.water.ie/connections/get-connected/>
- 5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
- 6) Irish Water Connection Policy/ Charges can be found at <https://www.water.ie/connections/information/connection-charges/>
- 7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
- 8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
- 9) To access Irish Water Maps email datarequests@water.ie
- 10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Paul Lowry from the design team on 018230377 or email paulowr@water.ie For further information, visit **www.water.ie/connections**.

Yours sincerely,



Yvonne Harris

Head of Customer Operations



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