ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME III TECHNICAL APPENDICES

PROPOSED RESIDENTIAL, RETAIL, SPORTS HALL & COMMUNITY CENTRE DEVELOPMENT

AT

Athlumney, Navan, Co. Meath

Prepared by

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In Conjunction with

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May 2024

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Appendix E 11.1 Resource & Waste Management Plan (RWMP) – Byrne Environmental

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RESOURCE & CONSTRUCTION WASTE MANAGEMENT PLAN

FOR

ALBERT DEVELOPMENTS LTD

RELATING TO A PROPOSED

MIXED-USE DEVELOPMENT

AT

BOYNE VILLAGE (PHASE 1B)
ATHLUMNEY
NAVAN
CO. MEATH

22nd May 2024

Ian Byrne MSc, MIOA, Dip Environmental & Planning Law

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1.0 INTRODUCTION

This document presents the Resource and Construction Waste Management Plan (RWMP) for the control, management and monitoring of resources and construction waste associated with a proposed large-scale residential development at Boyne Village (Phase 1B), Athlumney, Navan, Co. Meath Navan, Co. Meath.

The development consisting of a crèche, an anchor retail unit, a take-away, a café, a pharmacy, a G.P. clinic, a community centre and 322 residential units, consisting of: 35 no. 1 bedroom apartments 62 no. 2 bedroom apartments and duplexes 190 no. 3 bedroom houses and duplexes 35 no. 4 bedroom houses.

The RWMP has been prepared to demonstrate how the Construction Phase will comply with the following relevant legislation, relevant Best Practice Guidelines and Local Authority Waste Management Policies:

Waste Management Act 1996-2023

Waste Management (Collection Permit) Amendment Regulations 2016 (SI No. 24 of 2016)

EPA Best Practice Guidelines for the preparation of resource and management plans for construction and demolition projects, April 2021

Meath County Development Plan 2021 – 2027

The National Waste Management Plan for a Circular Economy 2024-2030

EPA (2020). A guide to by-products and submitting a notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011)(Draft):

EPA (2019). Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011

The Key Aspects of this RWMP are:

1 To maximise the use of resources in the Design and Construction Phases and to minimise the generation of waste with regard to the following principals:

- Green Procurement and Design
- Resource Re-Use, Recycling and Management
- Waste Prevention and Segregation

2 To maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for re-use and recycling both on-site and off-site.

2.0 MEATH COUNTY DEVELOPMENT PLAN WASTE OBJECTIVES

The *Meath County Development Plan 2021-2027* includes specific Policies and Objectives relating to the management of Construction and Demolition Waste as follows:

INF POL 70 To encourage the recycling of construction and demolition waste and the reuse of aggregate and other materials in future construction projects.

INF OBG 67 To require developers to prepare construction and demolition waste management plans for new construction projects over certain thresholds which shall meet the relevant recycling/recovery targets for such waste in accordance with the national legislation and national and regional waste management policy.

3.0 THE CIRCULAR ECONOMY

This Resource and Waste Management Plan has been prepared with regard to the *National Waste Management Plan for a Circular Economy 2024-2030.* This is Ireland's national waste strategy published in March 2024 that will replace the existing regional waste management plans across provincial and local regional authorities and places the emphasis on more waste prevention and increased recycling, reusing and repair practices.

The *Waste Management Plan for a Circular Economy 2024-2030* intends 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 *National Management Plan for a Circular Economy 2024-2030 has the following construction waste target*

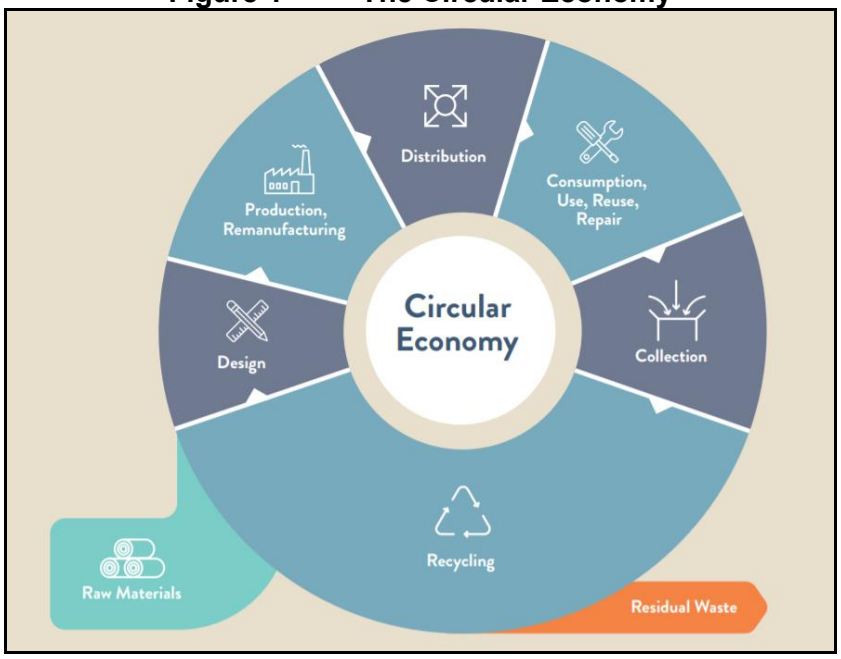
Target 1B Reduce Construction and Demolition Waste by 12% by 2030

The *Waste Framework Directive* has set a recycling target of 70% of non-hazardous Construction & Demolition Waste
The proposed development will implement the above policy as follows:

- Re-Use on-site of excavated soils and stones as fill material and as landscaping material.
- The purchase of construction materials as needed to prevent over supply and potential for damage whilst in storage.
- The segregation of construction waste streams into separate storage containers to maximise the potential for the re-use of the materials.
- The import of Article 27 soils where possible.

- The Developer of the Project is committed to implementing the relevant aspects of the Circular Economy Policy throughout the construction phase of the development.

Figure 1 The Circular Economy



It is the Applicants (Albert Developments Ltd) Policy to conform to the waste hierarchy (Figure 2), 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 2 The Waste Hierarchy

4.0 PROJECT DESCRIPTION

4.1 Proposed Development

The development will consist of the construction of a mixed-use development comprising 322 no. dwellings, a neighbourhood centre and district park on a site of c.13.47 hectares as follows:

A) 212 no. houses consisting of 177 no. 3-bedroom houses and 35 no. 4-bedroom houses (all houses 2-storeys except House Types F1, F2, F3 [corner], E1, E2, and E3 [corner];
B) 26 no. duplex units comprising, 13 no. 2-bedroom units and 13 no. 3-bedroom units (in 2 no. 3-storey blocks [with 8 no. duplex units abutting Apartment Block 2 in a 3-storey configuration];
C) 84 no. apartments across 3 no. apartment buildings (Block 2 [5-storeys] comprises 24 no. apartments consisting of 12 no. 1-bedroom apartments and 12 no. 2-bedroom apartments), Block 3 [5-storeys above neighbourhood centre – 6-storeys in total] comprising 36 no. apartments consisting of 14 no. 1- bedroom apartments and 22 no. 2-bedroom apartments and Block 4 [4-storeys above community centre – 5-storeys in total] comprising 24 no. apartments consisting of 9 no. 1-bedroom apartments and 15 no. 2-bedroom apartments (all apartments with balconies).
D) Series of landscaped/Public Open Space areas of c.3.69 hectares including playground areas and a Public Park of c.1.65ha of open space including playing fields as well as communal open space for the apartments and duplex apartments;
E) Provision of a c.489.9 sqm creche at ground floor of Block 2 as well as a 1,796 sq.m. Community Centre including a c.837 sqm sports hall, ancillary changing rooms, 4 no. community rooms and ancillary administration/office space rooms;
F) 2,020 sq. m. of retail floor space across 5 no. retail/retail service units [takeaway, café, pharmacy and General Practice clinic) as well as an anchor retail unit (net floor space 1,000 sq. m [GFA 1,311 sq. m.]), all accommodated within the ground floor level of the neighbourhood centre to the north-west of the site;
G) 688 no. car parking spaces, 242 no. bicycle parking spaces throughout the development;
H) A temporary pumping station located within the park to service the scheme;
I) Surface water attenuation measures and underground attenuation systems as well as all ancillary site development works (reprofiling of site as required) as well as connection to the public water supply and drainage services;
J) ESB sub-station, hard and soft landscaped areas, public lighting, bin stores, all ancillary landscape works including planting and boundary treatments and the provision of cycle paths, and all ancillary site development works.

Figure 3 Site Plan

4.2 Site History

The proposed application area is greenfield and was formerly in agricultural use.

4.3 Existing Structures

There are no structures on the site to be demolished.

4.4 Site Clearance

To facilitate the development the site shall be stripped of soils and vegetation. Soils for re-use on site will be maintained in stockpiles.

4.5 Material Balance Cut and Fill

Table 1 Cut & Fill Volumes

Scenario	Volume (m3)	Tonnes
Cut	62,500	100,00
Fill	24,913	39,861
Net Cut	37,587	60,139

Table 2 Topsoil Volumes

Scenario	Volume (m3)	Tonnes
Topsoil Strip	12,900	20,640
Topsoil Re-use	12,900	20,640
Export	0	0

A conversion figure of 1.6 to convert m^3 to tonnes has been applied to determine the tonnage of soils.

4.6 Export Soil Analysis

Ground Investigations Ireland have conducted site investigations at the site and the ground is comprised of top soil, made ground, granular deposits and cohesive deposits as detailed in their Ground Investigation Report Ref 12517-01-23, June 2023.

Prior to the commencement of construction works a Waste Classification Report will be prepared in accordance with the *EPA (2018) Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* by utilising the results of laboratory analysis and the *Haz Waste Online Classification Tool.* Soils will then be classified as an appropriate Waste Category.

4.7 Invasive Species

Species listed on the *Third Schedule of S.I. 477/2011 (as amended)*

A survey for invasive species was undertaken as part of an EcIA for the development in by project ecologists, *Openfield Ecological Services.*
No invasive species were identified at the subject site.

4.8 Asbestos

There are no structures on site that could contain asbestos containing materials (ACM).

4.9 Project Phasing

The general sequence of development works is detailed below in Table 3.

Table 3 Sequence of Construction Works

Activity Sequence	General Description
Site access and security	Set up site access point and erect site hoarding
Identification of Existing Utility Services	Set up bunting, mark location of live services, including E.S.B., Gas etc.
Removal of Vegetation	e.g. Trees and vegetation
Site Preparation	Soil stripping, stockpiling, export
Compounds	Establish materials storage compound and waste management compound
Facilities	Install site offices and welfare units
Infrastructure installation	Drainage, Utility ducts, power, internal roads
Substructure	Foundations
Superstructure	Frames
External Envelope	Place façade to superstructure
Internal Finishes	Mechanical & Electrical
External Landscaping	Hard and soft landscaping, road surfacing

5.0 RWMP Roles and Responsibilities

5.1 Project Director / Manager

The Project Director will be responsible for the overall implementation of the RWMP and providing the budget for its implementation and management. The Project Director will ensure that the reporting and recording requirements are met and all necessary resources are in place to support the implementation of the RWMP from Design Stage to Project Completion.

5.2 Resource and Waste Manager

The Resource and Waste Manager (RWM) will be responsible for:

- Implementing all aspects of the RWMP throughout the Construction Phase.
- Assisting the Project Manager on the implementing of the aspects of the Circular Economy.
- Ensuring that all resources are managed throughout the Construction Phase
- Recording the volumes and types of construction wastes generated.
- Communicating with the Local Authority on waste related matters and issuing of waste records.
- Management of the waste storage compound to ensure that all construction waste streams are stored separately and that cross-contamination does not occur.
- Maintaining a file of all Waste Collection Permits and Waste Facility Permits / Waste Licences that each waste load is exported to.
- Ensuring that all waste loads exiting the site are contained in a vehicle displaying an appropriate NWCPO Permit number.
- Maintaining a receipt of each waste load delivered to authorised facilities.
- Identifying and reporting on damaged construction materials and identifying how damage to resources and materials shall be prevented.
- Preparation of monthly waste management report detailing waste volumes generated, re-use and recycling rates and details on damaged raw materials and how they can be returned for repair and future re-use.
- Conducting Resource and Waste Management Audits
- Communicating with the EPA regarding Article 27 By-Product determinations

5.3 Site Personnel

All personnel on site will be responsible for the effective implementation of the RWMP. All staff will receive Induction and Tool-Box training on resource management and waste prevention, segregation and disposal.

5.4 Gate Person

Gate Person duties will include the inspection all vehicles exiting site with waste to ensure that they have a Waste Collection Permit (WCP) Number displayed on the side of the vehicle.

If the vehicle does not have a WCP Number displayed, the vehicle will be refused exit and the RWM will ensure that the waste load is returned to the site area from where it came.

5.5 Staff Training

Copies of the RWMP will be made available to all relevant personnel on site. The RWM will arrange for all site personnel and contractors to be instructed about / receive training on the objectives of the RWMP and materials management, and be informed of the responsibilities that fall upon them as a consequence of its implementation The topics to be covered will include;

- Project programme and requirements
- Health and Safety requirements
- RWMP
- Materials to be segregated
- Segregation systems and protocols
- Arrangement for the storage and handling of reusable materials and recyclables
- Document control requirements

Where source segregation and materials re-use techniques apply, each member of staff will be given instructions on how to comply with the RWMP and will be displayed for the benefit of site staff.

Table 4 Principal Project Staff

Title	Name	Contact Details
Project Director	TBC	TBC
Construction Director	TBC	TBC
Construction Manager	TBC	TBC
Resource & Waste Manager	TBC	TBC
Site Engineer	TBC	TBC

TBC To be confirmed on the appointment of a Main Contractor

6.0 RESOURCE AND WASTE MANAGEMENT DESIGN APPROACH

This section provides details on how resource optimisation and the management and minimisation of waste streams shall be implemented from design phase through to completion of the project.

6.1 Site Preparation

- Reuse site fencing and staff welfare units from previous Projects.
- Minimise concrete use in site compounds.

6.2 Re-Use of existing site elements

- Identify materials that can be re-used or recycled on-site to minimise the use of virgin materials.
- Top and sub-soils may be retained on-site and re-used for landscaping purposes
- Stone from the northern boundary wall to be demolished may be retained and re-used in its restoration.

6.3 The Use of Recycled materials and surplus materials

- Use recycled aggregates where possible to minimise the use of virgin materials.
- Identify materials which have a % of recycled material contained within them e.g., Asphalt may include recycled glass or recycled asphalt.
- Where material surpluses arise, they shall be stored to prevent damage and re-used on other projects or returned to the supplier.

6.4 Materials Procurement

- Identify suppliers that can supply low environmental impact products and materials
- Identify recycled materials to be used on the project
- Minimise over-ordering to reduce over storage and to minimise potential of damage to materials
- Request that material suppliers take back damaged materials for repair and re-use.
- Request that suppliers minimise packaging on all materials

6.5 Off-Site Construction

The use of pre-constructed building elements is an efficient process that minimises the generation of on-site construction waste.

- Wood / Steel frames and wall facade panels shall be constructed off-site and assembled on-site.
- Balconies shall be constructed off-site
- Pre formed façade panels

6.6 SOIL MANAGEMENT

Planning the Optimal Site Level

The Applicant undertakes surveys of the levels of sites to determine the most appropriate ground level for the development. In doing so we reduce the requirement for either excavating material or bringing additional soil to site to bring the site to the designed finished floor levels. This intervention at the design stage directly impacts our carbon footprint by reducing the number of heavy goods vehicle journeys to and from site carrying soil.

Circular Economy: Targeting Net Zero Soil Import

Once on site, wherever possible, the required level is achieved by transferring soil within the site rather than importing and exporting soil. This process, known as “cut and fill” is used on all our sites. This approach gives the ability to work towards net zero soil import and export. Where this is not possible, we leverage our total landbank using our excess soil for fill on other sites, with the end goal of sending as little soil to landfill as possible.

7.0 DESCRIPTION OF WASTE ARISINGS

The expected construction waste that will be generated throughout the course of the development is detailed in Table 4 below.

The calculated construction waste tonnage has been derived from the *Building Research Establishment Environmental Assessment Method (BREEAM)* which specifies that 10.1 tonnes of construction waste is generated for every 100m^2 of development area. Based on the combined building area contained in the Schedule of Accommodation for the development of c.37,237m^2, it has been calculated that up to c. 4133 tonnes of construction waste may be produced.

The tonnage of soils and stones to be generated has been determined from the cut and fill analysis for the site.

Table 5 details the EPA's % breakdown of Construction waste for 2022.

Table 5 Construction Waste Composition EPA 2020 Waste Statistics

Waste Type	% composition of total waste
Metal	15
Wood Plastic Glass	4
Bituminous Materials	10
Concrete Brick Gypsum	41
Mixed C&D	30

Table 6 provides the calculated construction waste associated with the project.

Table 6 Calculated construction waste

LoW Code	Description	Volume Generated (tonnes)	Prevention (tonnes) Non Waste	Reused (tonnes) Non-Waste	Recycled (tonnes) Waste	Recovered (tonnes) Waste	Disposed (tonnes) Waste
17 01 01	Concrete Brick Tiles and Ceramics	1695	0	915	685	0	85
17 01 02							
17 01 03							
17 02 01	Wood Glass Plastic	165	0	0	130	33	2
17 02 02							
17 02 03							
17 03 02	Bituminous Material	413	0	178	235	0	0
17 04 07	Mixed Metals	620	0	0	620	0	0
17 05 04	Soil and Stone	120,640	0	20,640	0	0	100,000
17 09 04	Mixed C&D Waste	1240	0	385	495	223	174
20 01 08	Biodegradable Canteen Waste	10	0	0	0	0	10
20 03 01B	Mixed Municipal Waste	10	0	0	0	0	10
20 01 01	Paper & Cardboard	1	0	0	1	0	0

8.0 CONSTRUCTION WASTE MANAGEMENT

- From the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

- Spill kits shall be located within the site compound with clearly labelled instructions on how they shall be used to clean up fuel/oil spills.

- All vehicle and plant oils and liquid construction materials shall be stored in secure impermeable storage units.

- All diesel-powered generators shall be inspected on at least a weekly basis by a delegate of the project manager to ensure it is not leaking diesel or oils.

- All empty containers containing residual quantities of oils, greases and hydrocarbon-based liquids shall be stored in a dedicated, clearly labelled impermeable container.

- In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

- It will be the responsibility of the Resource and Waste Manager (RWM) to ensure that a written record of all quantities and natures of wastes exported off-site are maintained on-site in a Waste File at the Project office.

- It is the responsibility of the RWM that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

  Waste Management (Collection Permit) Regulations 2007 (SI No.820 of 2007)
  Waste Management (Collection Permit) Amendment Regulations 2016 (SI No.247 of 2016)
  Waste Management (Collection Permit) Amendment No. 2 Regulations 2023 (SI No.104 of 2023)
  Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) (Amendment) Regulations S.I.250 of 2019.
  Waste Management Act 1996 (Revised 1st July 2023).

- Prior to the commencement of the Project, the RWM shall identify a permitted Waste Contractor(s) who shall be engaged to collect and dispose of all inert and hazardous wastes arising from the project works.

- The RWM shall maintain copies of all Waste Collection Permits and copies of the Waste Facility Permit or Waste Licence to which waste materials are exported to. The RWM shall ensure that all Permits/Licences are within date.

- All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the *EPA (2018) Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* document to ensure that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

Figure 4 Construction Waste segregation compound design concept

Figure 5 Oil Spill Kit

Figure 6 Bund for waste oil container storage

9.0 ON-SITE RESOURCE MANAGEMENT & WASTE REUSE RECYCLING AND MANAGEMENT

This section of the RWMP describes how construction waste shall be minimised and how the re-use and recycling of wastes shall be maximised

- Materials shall be ordered on an *"as needed"* basis to prevent over supply and preventing damage to bulk orders stored on-site.
- Materials shall be stored and handled in a manner that minimises the generation of damaged materials
- Materials shall be ordered in appropriate sequence to minimise materials stored on site
- All staff and Sub contractors shall be advised through inductions and tool box talks on how to dispose of their waste correctly on-site.
- Broken concrete blocks and excess aggregate materials shall be segregated and stored off-site for use as hard standing material on future projects. This will result in the following positive impacts:
    - Reduction in the requirement for virgin aggregate materials from quarries
    - Reduction in energy required to extract, process and transport virgin aggregates
    - Reduced HGV movements associated with the delivery of imported aggregates to the site
    - Reduction in the amount of landfill space required to accept C&D waste
- Excess wood will be segregated in separate skips and sent for recycling.
- Plastic arising from general waste or packaging will be segregated and stored in separate skips.
- Metals waste shall be stored in dedicated skips
- Top soil that is stripped shall be retained in managed bunds to prevent erosion and reduce the leaching of minerals from the soil.

10.0 WASTE SOILS & STONES EXPORT & ARTICLE 27 DECLARATIONS

Excavated excess soils that are required to be exported off-site shall be tested in accordance with EPA (2018) *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous.* Non-Hazardous soils may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that a declaration of a material as a by-product is notified to the EPA. The EPA publication *A guide to by-products and submitting a notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011)* shall be considered in this regard. Appendix I presents the schematic process by which a material is determined as a waste or a by-product.

The records of all Article 27 declarations and WAC Analytical Tests and *Haz Waste Online* assessments shall be maintained on-site by the RWM.

11.0 WASTE RECORD KEEPING

It is the responsibility of the RWM that a record of all quantities and natures of all wastes reused / recycled and exported off-site during the project are maintained in a Waste File at the Project office.

The following information shall be recorded for each load of waste exported off-site:

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e. disposal / recovery / export

An indicative template is contained in Figure 7, to ensure that full traceability of materials to its final destination.

Verifiable and validated tracking and authorisation documentation will be maintained for all wastes destined for re-use, recovery, recycling or disposal. Justification will also be provided where a disposal option had been employed.

The waste records shall be maintained on-site and made available to Meath County Council as requested.

12.0 RESOURCE AND WASTE MANAGEMENT AUDITING

The effectiveness of a Resource and Construction Waste Management Plan and its implementation, will be subject to quarterly audits by the RWM throughout the duration of the construction phase.

Audits will focus on materials inputs to the project and the waste outputs identifying:

Resources
How resource management was integrated into the design of project buildings and areas

Re-use, recycling of existing on-site materials prior to development including soils, buildings, structures.

Re-using surplus materials from previous development projects eg office cabins, fencing, aggregates, concrete products.

Additional opportunities for future resource management.

Waste
The audits will also investigate the operational factors and management policies that contribute to the generation of waste and identify appropriate corrective actions, where necessary.

Performance targets will be developed, e.g. an 85% overall recycling target, successes and failures will be recorded and Action Plans will be developed to address any issue which arise.

Inspections of the waste storage areas will be undertaken and recorded on a weekly basis, issues relating to housekeeping, inappropriate storage and segregation of wastes.

The RWM will record the findings of the audits, including types and quantities of waste arising, final treatments and costs, in a quarterly audit report.

The Final Waste Audit will examine the manner of how resources are managed and how and where the waste is produced and how waste generation can be reduced in future projects.

13.0 WASTE EXPORT PERMITS/LICENCES

All vehicles exiting the site containing any waste material shall be inspected by the gate man to ensure that they display on the side of the vehicle a NWCPO (National Waste Collection Permit Office) issued Waste Collection Permit Number.

Where a NWCPO issued Waste Collection Permit Number is not displayed the RWM shall be notified and the vehicle shall be instructed to return the waste load to the specific area on the site and will not be allowed exit the site with the waste load.
Table 5 shall be updated once a main contractor has been appointed.

Table 7a Register of Waste Collection Permits

Holder	Address & Contact	Waste Collection Permit #	Expiry Date	Materials Accepted
TBC				

TBC To be confirmed on appointment of Main Contractor

Table 7b Register of Local Authority issued Waste Facility Permits

Holder	Facility Address & Contact	Waste Collection Permit #	Expiry Date	Materials Accepted
TBC				

TBC To be confirmed on appointment of Main Contractor

Table 7c Register of EPA issued Waste Licences

Holder	Facility Address & Contact	Waste Licence #	Expiry Date	Materials Accepted
TBC				

TBC To be confirmed on appointment of Main Contractor

Figure 7 Example of Waste Tracking Template

Waste Source	Waste Type	LoW Code	Haulier	Acceptance Facility Permit #	Tonnage	Date	Vehicle Reg NWCPO#
Site 1	Inert Soil & Stone	17 05 04	Murphy	Huntstown Quarry Wfpfg09000601	20	10.10.21	22D1234 NWCPO-ABC123
Site 1	Metals	17 04 07	O' Reilly	Hammond Lane P1002-01	10	11.10.21	22D5678 NWCPO-123ABC
Site 1	Concrete	17 01 01	Smyth	IMS Hollywood W0129-02	30	12.10.21	22D1234 NWCPO-ABC123

Appendix E 11.2 Operational Waste Management Plan (OWMP) – Byrne Environmental

Byrne Environmental
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OPERATIONAL WASTE MANAGEMENT PLAN

FOR

ALBERT DEVELOPMENTS LTD

RELATING TO A PROPOSED

MIXED-USE DEVELOPMENT

AT

BOYNE VILLAGE (PHASE 1B)
ATHLUMNEY
NAVAN
CO. MEATH

22nd May 2024

Ian Byrne MSc, MIOA, Dip Environmental & Planning Law

TABLE OF CONTENTS

1.0 INTRODUCTION

This document presents the Operational Waste Management Plan (OWMP) for the control, management and monitoring of waste associated with a proposed mixed-use development at Boyne Village (Phase 1B), Athlumney, Navan, Co. Meath Navan, Co. Meath.

The development consisting of a crèche, an anchor retail unit, a take-away, a café, a pharmacy, a G.P. clinic, a community centre and 322 residential units, consisting of: 35 no. 1 bedroom apartments 62 no. 2 bedroom apartments and duplexes 190 no. 3 bedroom houses and duplexes 35 no. 4 bedroom houses.

The **Objective of this Waste Management Plan** 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 residents of the development.

The **Goal of this Waste Management Plan** is to achieve the following waste reduction and recycling targets detailed in the *National Management Plan for a Circular Economy 2024-2030.*

Target 1A	Achieve a 6% reduction in residual municipal waste by 2030
Target 2A	Achieve 90% compliance in the dry recycling bin by 2030
Target 2B	Achieve a 10% increase per annum in material compliance in the residual bin by 2030

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 assist residents minimise the generation of mixed waste streams.
- That the principle of waste segregation at source is the integrated into the development by the provision of 3-bin systems in all residential units
- That all 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 1996-2023 and all associated Waste Management Regulations.

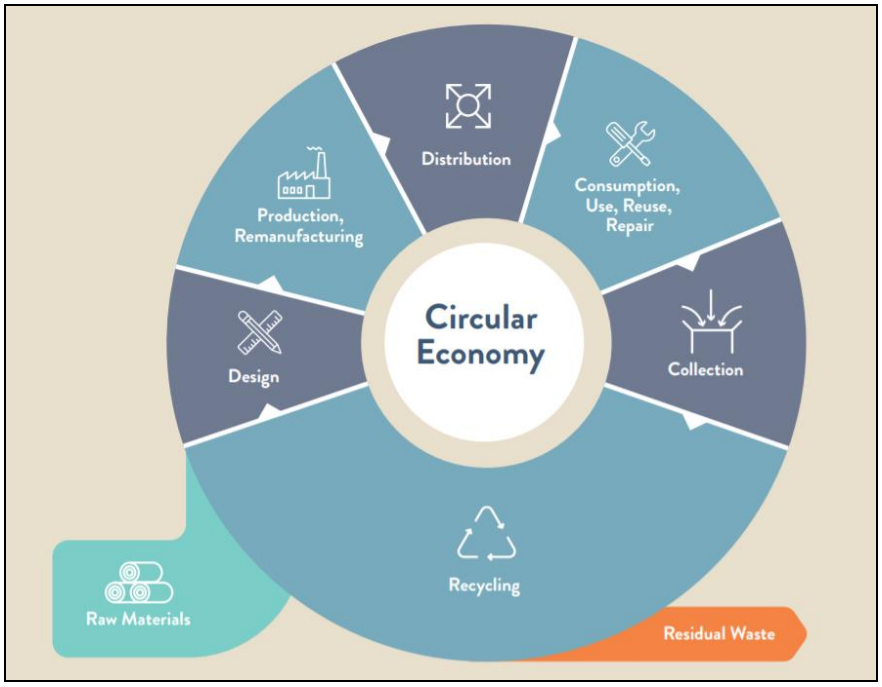
2.0 WASTE MANAGEMENT POLICIES AND GUIDANCE

National Waste Management Plan for a Circular Economy 2024-2030.

This Operational Waste Management Plan has been prepared with regard to the *Waste Management Plan for a Circular Economy 2024-2030.* This is Ireland's national waste strategy published in March 2024 that will replace the existing regional waste management plans across provincial and local regional authorities and places the emphasis on more waste prevention and increased recycling, reusing and repair practices.

The *Waste Management Plan for a Circular Economy 2024-2030* intends 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.

FIGURE 1 THE CIRCULAR ECONOMY



The Waste Hierarchy

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.

It is the intention of the Applicant (Albert Developments Limited) to ensure that the design and operation of the development conforms to the Waste Hierarchy.

FIGURE 2 THE WASTE HIERARCHY

Meath County Council's Development Plan 2021 - 2027 Waste Management Policy and Objectives:

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.

INF POL69 To require the provision of bring banks, bottle banks or other appropriate recycling facilities as part of the overall development in the case of new or extended commercial, employment, educational, recreational facilities and managed residential developments.

INF OBJ64 To ensure that during the assessment of planning applications through the Development Management process that provision for household waste recycling is adequately addresses in all new residential developments.

OBJ DMSO238 Ensure the maximum distance between the front door to a communal bin area does not exceed 50 metres

Meath County Council's Development Plan 2021 - 2027 Development Management Standards

11.5.27 Waste Management

Regard should be had to the number of individual bins required to serve each residential unit at design stage and in particular the requirement for segregating waste for recycling and food waste, (Refer to Chapter 6 Infrastructure for further details)

DM POL 16 All new residential schemes shall include appropriately sited and designed secure refuse storage areas, details of which shall be clearly shown in pre-application discussion and planning application documentation.

DM OBJ 52 in residential schemes, appropriately sized bin storage areas must be provided to the front of terraced dwellings in locations which are easily accessible by the householder. These areas shall be well screened and the design shall integrate with the dwelling.

DM OBJ 53 Apartment schemes shall make provision for waste segregation and recycling. Bin storage shall generally be on the ground floor level of development, be adequately ventilated, screened from public view and adjacent to the block it serves. Where appropriate, the bin storage area shall be a separate structure to the apartment building.

DM OBJ 54 Shared bin storage areas shall be located conveniently for residents and collection service providers with appropriate security measures.

BS 5906:2005 Waste Management in Buildings-Code of Practice

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 for residential building.

The Department of Housing, Planning and Local Government – Sustainable Urban Housing: Design Standards for New Apartments

The development will include 3-bin waste segregation systems at source together with a communal waste storage area to serve the apartment block have been designed in compliance with *Section's 4.8 and 4.9 Refuse Storage* of *The Department of Housing, Planning and Local Government – Sustainable Urban Housing : Design Standards for New Apartments – Guidelines for Planning Authorities. 2018 (as revised 2022)* as follows:

4.8 Provision shall be made for the storage and collection of waste materials in apartment schemes. Refuse facilities shall be accessible to each apartment stair/lift core and designed with regard to the projected level of waste generation and types and quantities of receptacles required. Within apartments, there should be adequate provision for the temporary storage of segregated materials prior to deposition in communal waste storage and in-sink macerators are discouraged as they place a burden on drainage systems.

4.9 The following general design considerations should be taken into account in the provision of refuse storage facilities:

- *Sufficient communal storage area to satisfy the three-bin system for the collection of mixed dry recyclables, organic waste and residual waste;*

- *In larger apartment schemes, consideration should also be given to the provision of separate collection facilities for other recyclables such as glass and plastics;*

- *Waste storage areas must be adequately ventilated so as to minimise odours and potential nuisance from vermin/flies and taking account the avoidance of nuisance for habitable rooms nearby;*

- *Provision in the layout for sufficient access for waste collectors, proximity of, or ease of access to, waste storage areas from individual apartments, including access by disabled people;*

- *Waste storage areas should not present any safety risks to users and should be well-lit;*

- *Waste storage areas should not be on the public street, and should not be visible to or accessible by the general public. Appropriate visual screening should be provided, particularly in the vicinity of apartment buildings;*

- *Waste storage areas in basement car parks should be avoided where possible, but where provided, must ensure adequate manoeuvring space for collection vehicles;*

- *The capacity for washing down waste storage areas, with wastewater discharging to the sewer.*

3.0 KEY ASPECTS TO ACHIEVE WASTE TARGETS

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

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

The Key Aspects that are designed into the development are:

- 3-Bin systems to encourage waste segregation at source
- Communal Bin Store to provide for Organic, Recyclable, Mixed Waste, Glass and WEEE waste storage
- Residents to be provided with a Bulky Waste collection service

4.0 WASTE SEGREGATION AT SOURCE IN RESIDENTIAL UNITS

The design of all dwellings shall include sufficient internal kitchen space for the segregation at source and storage of general unrecyclable waste, green recyclable waste and organic waste in a 3-bin system.

Image of typical Domestic kitchen 3 bin systems to segregate waste at source

5.0 HOUSE WASTE BINS

Individual houses and terraced houses shall have a single grey mixed municipal waste 240 litre bin, a green 240 litre dry recyclable waste bin and a brown 110/240 litre organic waste bin which shall be stored within the curtilage of each house. Residential houses shall be served by private waste collection contractors.

6.0 APARTMENT &DUPLEX COMMUNAL WASTE STORAGE AREAS

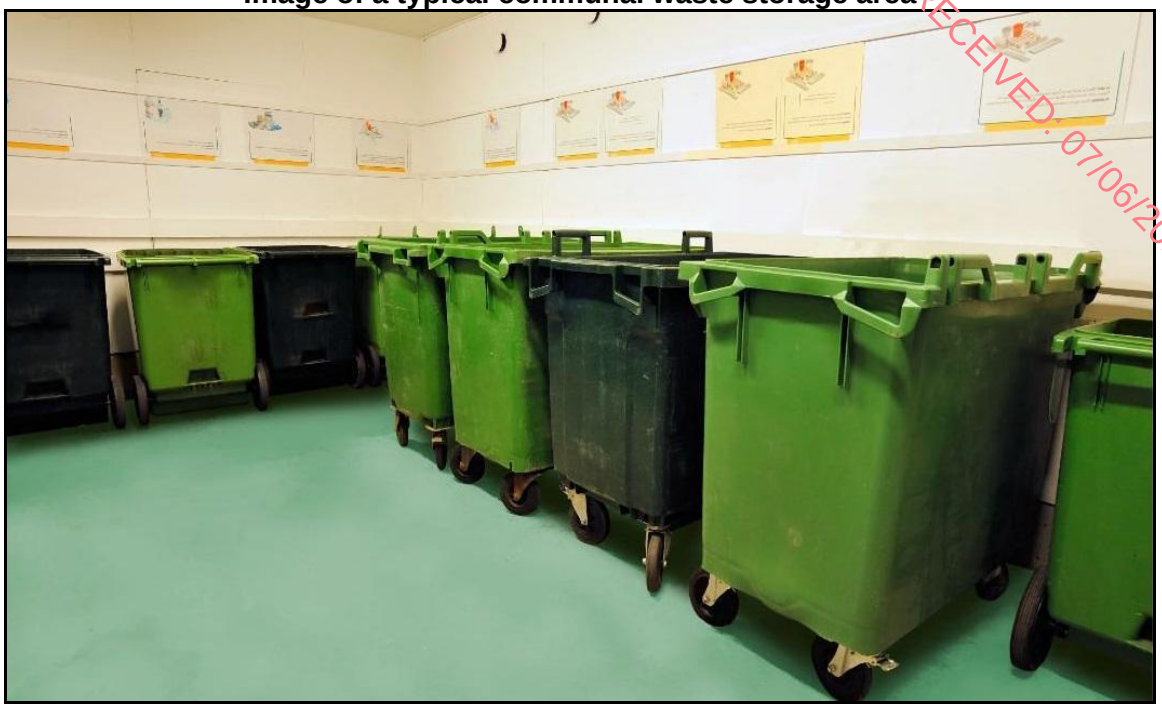
Apartments and Duplex Units shall be served by communal waste storage areas and shall include clearly visible guidelines on the appropriate segregation of different waste types.

Signage to inform residents of their obligations to reduce waste and segregate waste within the home and dispose of waste in the correct bulk bin will be clearly posted within each waste storage area.

The communal waste storage area has been designed to include the following aspects:

- A defined pedestrian route shall be marked from the apartment buildings to the waste storage area.
- A non-slip surface shall be provided within the waste storage area.
- The waste storage areas shall be passively / mechanically ventilated.
- The waste storage area shall be fitted with sensor lighting.
- The waste storage area shall be fitted with CCTV cameras and associated signage.
- The waste storage area shall be designed to provide safe access from the apartment units by mobility impaired persons.
- The waste storage area shall be no more than 50m from any apartment/duplex unit.
- A dedicated and clearly labelled area shall be provided in which mobility impaired persons may place wastes into receptacles at a lower level which will be subsequently transferred to the bulk storage bins on a weekly basis by the Facilities Management Company.
- The waste storage area shall include ground drainage to sewer 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 communal waste storage area shall contain a brown organic waste bulk bins. Appropriate signage shall be placed on all brown bins informing residents of the exact nature of organic waste that can be placed in the bin. Signage will also state that all organic waste must be placed within biodegradable bags before placing in the bulk bin.
- The communal waste storage area shall contain a biodegradable waste bag dispenser which will facilitate and encourage residents of apartments and duplexes to separately segregate food and organic waste within their apartments in a dedicated bin.

Image of a typical communal waste storage area



A battery box and a WEEE Bin shall also be provided in the communal waste storage areas, an example of which is shown in the following image. This shall be managed by a specialist waste contractor who will be responsible for its routine collection.

Image of WEEE & Battery Recycling Cage

The communal waste storage area shall also contain glass recycling bins. This will allow glass to be diverted away from general waste.

Image of Glass Recycling Bin

7.0 APARTMENT COMMUNAL WASTE STORAGE AREA DESIGN

The Apartment Block has been designed to accommodate a communal bin storage area which shall be of sufficient size to house the required number of 1100 litre bulk bins as detailed in Table 1 below.

The area of a standard 1100 litre bulk bin is 1.7m^2.
The area of a standard 240 litre glass / brown bin is 0.43m^2.

To allow free access to the bins and provide sufficient space for their movement and to provide contingency capacity, the required bin store area = bin floor area x 1.5.

Table 1 Communal Residential Apartment Bin Store Areas

Residential	Bin Storage Area (m^2)
Block 2 Apartments	14.7
Block 3 Apartments	22
Block 4 Apartments	27

The communal bin stores as designed exceeds the minimum area requirement thus contingency space is available.

8.0 RETAIL UNITS WASTE MANAGEMENT

Commercial waste generated by the commercial units shall be managed by the tenants of the units who shall engage a commercial waste contractor to collected waste generated. Commercial waste shall be stored in a dedicated waste storage area separate from the domestic communal waste storage area.

Waste shall be segregated into grey (mixed waste), green (dry recyclable), brown (organic) and cardboard packaging waste.

The Retail Unit Bin Store will include 1100 litre Mixed Waste Bins, 1100 litre Dry Recyclable Waste Bins, 240 litre Brown Organic Waste Bins, 240 litre glass bins and a WEEE Cage. Bailing units may be utilised by Retail tenants for compacting carboard and plastics.

9.0 CRECHE WASTE MANAGEMENT

Commercial waste generated by the Creche shall be managed by the operators of the creche who shall engage a commercial waste contractor to collected waste generated. Creche waste shall be stored in a dedicated waste storage area separate from the domestic communal waste storage area.

Waste shall be segregated into grey (mixed waste), green (dry recyclable), brown (organic) and cardboard packaging waste.

The Creche Bin Store will include 1100 litre Mixed Waste Bins, 1100 litre Dry Recyclable Waste Bins, 240 litre Brown Organic Waste Bins, 240 litre glass bins and a WEEE Cage.

10.0 COMMUNITY CENTRE & SPORTS HALL WASTE MANAGEMENT

Wastes generated by the Community Centre and Sports Hall shall be managed by the Facilities Management Company. Waste generated from these areas shall be stored in a dedicated waste storage area separate from the domestic communal waste storage area.

Waste shall be segregated into grey (mixed waste), green (dry recyclable), brown (organic) and cardboard packaging waste.

The Community Centre Bin Store will include 1100 litre Mixed Waste Bins, 1100 litre Dry Recyclable Waste Bins, 240 litre Brown Organic Waste Bins, 240 litre glass bins and a WEEE Cage.

Table 2 Commercial Bin Store Areas

Unit	Minimum Bin Storage Area (m^2) (Area provided)
Retail	79
Café, Take Away, GP, Pharmacy	22
Creche	13
Community Centre	27

The commercial non-domestic bin stores as designed exceed the minimum area requirement thus contingency space is available.

11.0 AMENITY AREAS WASTE MANAGEMENT

Waste generated in the external amenity areas and spaces shall be managed by the Facilities Management Company who shall ensure there are sufficient 3-bin systems located in each area for easy and clear segregation of waste, an example of which is shown below.

Image of external amenity areas waste segregation recycling bin system

12.0 WASTE MANAGEMENT DUTIES OF THE FACILITY MANAGEMENT COMPANY

Waste Management & Record Keeping

The Facilities Management Company shall maintain a weekly register detailing the quantities and breakdown of general mixed domestic waste, recyclable waste and organic waste wastes removed from the apartment aspect of the development. Supporting documentation shall be provided by the Waste Collection Contractor on a monthly basis. This will allow for waste recycling targets to be tracked to achieve the 2030 90% recycling target.

The Facilities Management Company shall prepare an annual information report for all apartment residents detailing the quantities and waste types generated by the development for the previous year. The report shall include reminder information on the correct segregation at source procedures and the correct placement of wastes in the waste storage area. Other aspects of ongoing waste management continuous improvement shall also be stated.

Annual Bulky Waste Collections

The Facilities Management Company may provide a bulky waste collection and transport service to all residents of the development on an annual basis which will allow residents to have bulky items such as appliances and furniture removed from their houses and apartments and transported to a licenced facility. This initiative will also reduce the potential for illegal waste collections and fly-tipping in the local area.

13.0 GENERATED WASTE QUANTITIES

The volume of waste that will be generated during the full occupancy of the development have been calculated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice.*

British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice states that 70 litres of waste are generated per bedroom per week with an allowance of an additional 30 litres per unit per week.

The subject development includes 843 no. bedrooms in 322 no. residential units. The total domestic waste generated per week is detailed in Table 3.

Table 3 Total weekly Domestic waste generation

Scenario	#	Factor	Weekly Waste litres
Bedrooms	843	70 Litres per week / bedroom	59,010
Units	322	30 litres per week / unit	9,660
Total Weekly Domestic Waste			*68,670*

The volume of commercial waste that will be generated has been calculated with regard to *British Standard BS 5906:2005 Waste Management in Buildings-Code of Practice* as detailed in Table 4.

Table 4 Total weekly Commercial waste generation

Unit	Area (m^2)	Weekly Waste litres
Anchor Retail	1000	10,000
GP Surgery	232	600
Cafe	210	4500
Take Away	82	3300
Pharmacy	88	2200
Creche	512	3600
Community Centre	1848	500
Totals	-	*24,700*

14.0 WASTE STREAMS TO BE GENERATED

Table 5 details the range of waste types and their associated LoW Code from Chapter 20 of the EPA Publication *Waste Classification, List of Waste & determining if Waste is Hazardous or Non-hazardous* that shall be generated during the operational phase of the development.

Table 5 Domestic and Commercial Waste Waste Types

Chapter 20 Municipal wastes (Household waste and similar commercial, industrial and institutional wastes) including separately collected fractions	
20 01 01	Paper and Cardboard
20 01 02	Glass
20 01 08 A	Biodegradable kitchen and canteen waste
20 01 13*	Solvents
20 01 21*	Florescent tubes
20 02 25	Edible oil and fat
20 01 28	Paint, inks adhesives and resins
20 01 30	Detergents
20 01 33*	Batteries and accumulators
20 01 35* A, B C, D	Discarded electrical and electonic equipment containing hazardous components
20 01 36 A, B C, D	Discarded electrical and electonic equipment
20 01 39	Plastics
20 01 40 C	Metals
20 03 01 A	Municipal mixed residual household waste
20 03 01 D	Municipal mixed dry recyclablesl household waste
20 03 07 A	Bulky Household Waste
20 01 31*	Cytotoxic and cytostatic medicines
20 01 32	Medicines other than those mentioned in 20 01 31*

15.0 BRING BANK

The development will include a bring bank for items such as glass bottles and clothes which will be located to the south of the Sports Hall away from residential units as shown in Appendix I.

Image of bring bank

16.0 LOCAL CIVIC AMENITY CENTRE

The closest Civic Amenity (Recycling) Centre is located at Mullaghboy, Navan c. 4km from the development site. Residents will be able to bring various waste stream to this recycling facility.

The range of wastes accepted include:

- Bulky Wastes
- Wood/Timber
- Green waste
- Household Appliances
- Oils and Paint
- WEEE
- Batteries
- Glass
- Metal

17.0 WASTE COLLECTION STRATEGY

Bins in the communal bin store will be collected directly from the bin store by the waste collection contractors. Emptied bins shall be immediately returned to the bin store.

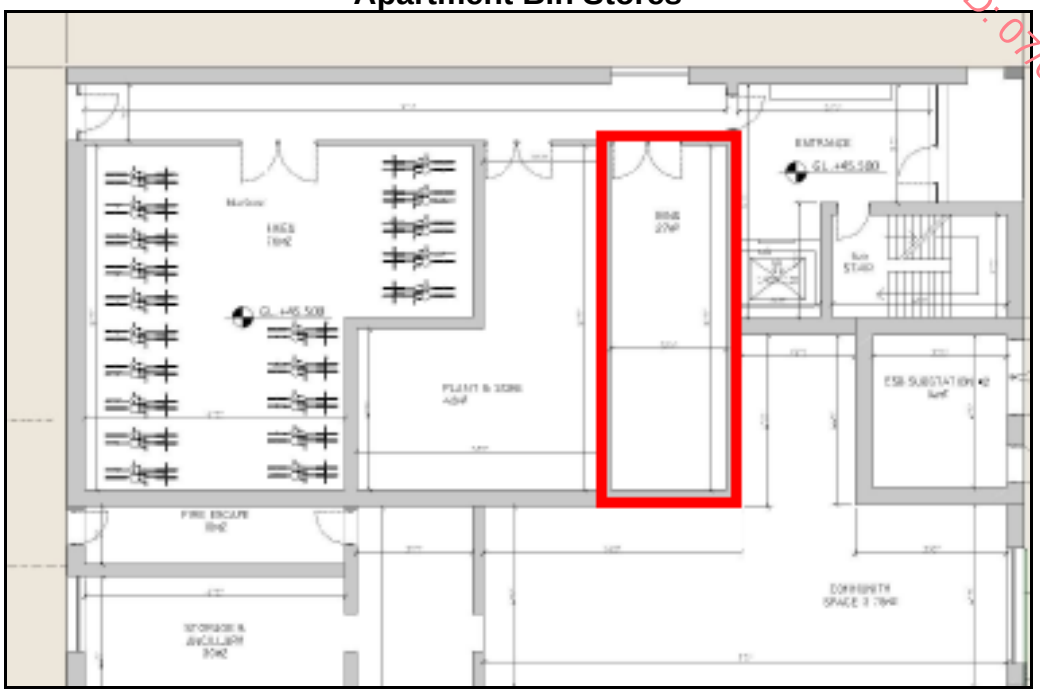
House residents will be provided by kerb-side bin collections.

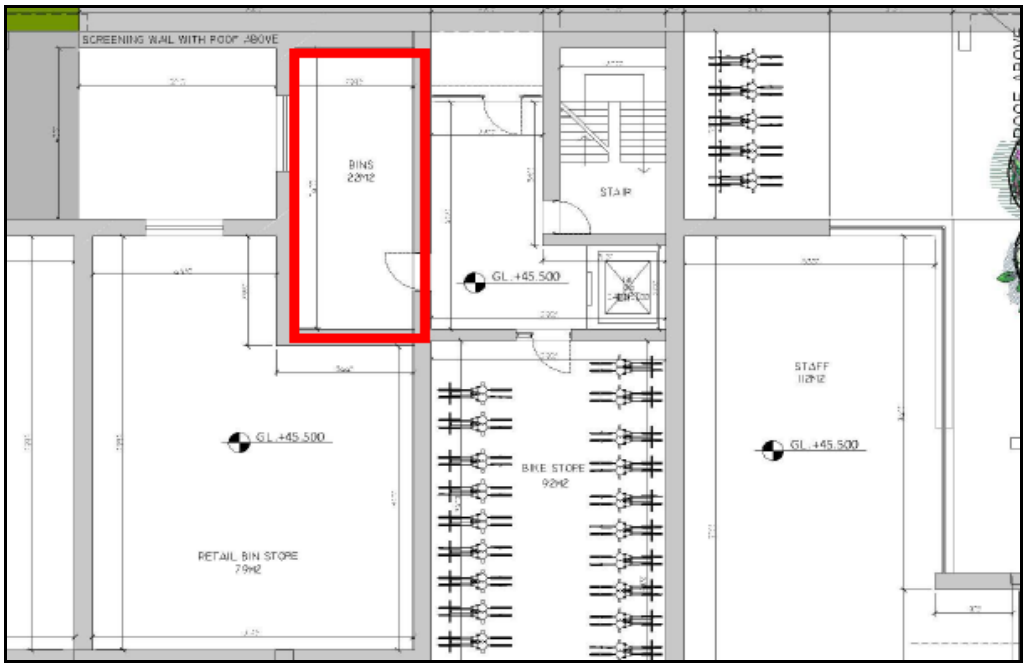
Commercial waste contractors shall collect waste bins from the Retail bin store.

All waste collection contractors will have valid Waste Collection Permit Numbers displayed on all waste collection vehicles in accordance with and operate in compliance with the *Waste Management (Collection Permit) Regulations.*

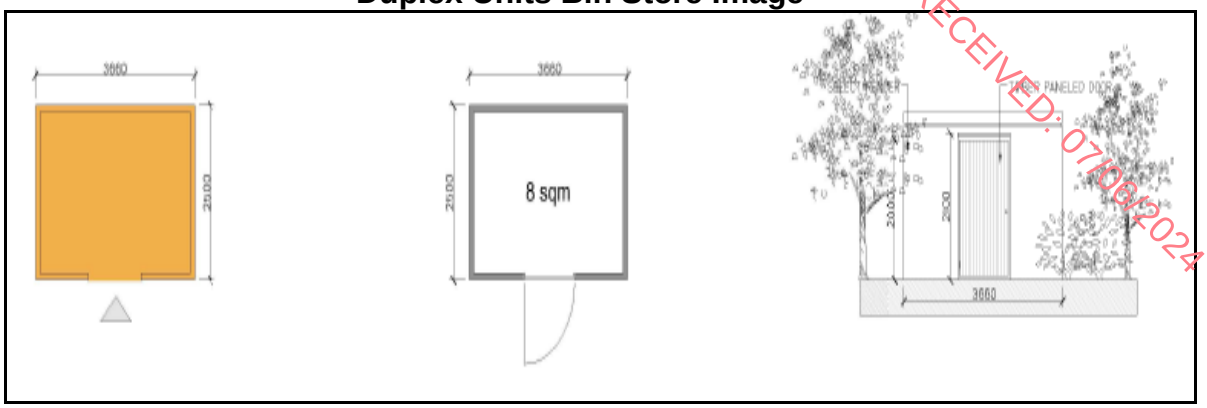
APPENDIX II
Bin Store Locations

Apartment Bin Stores

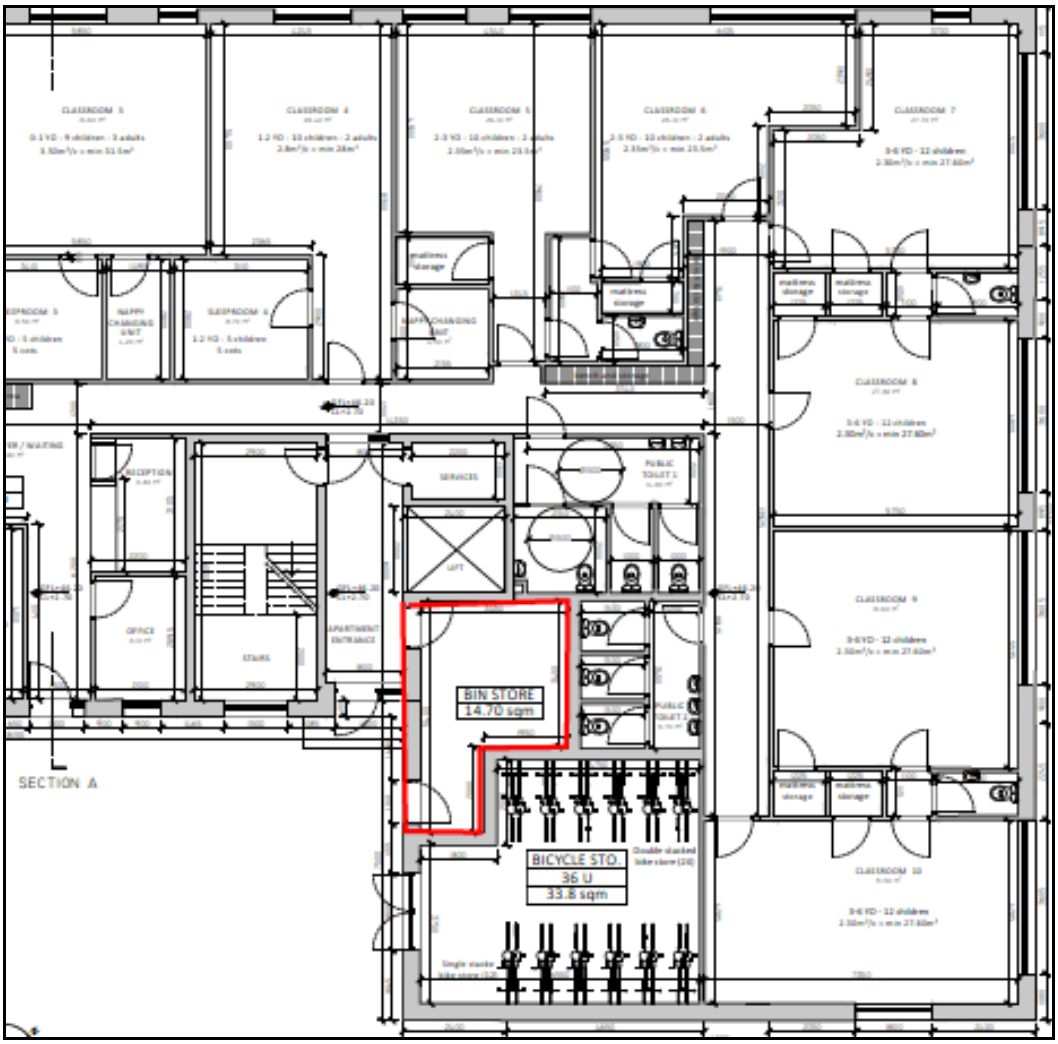




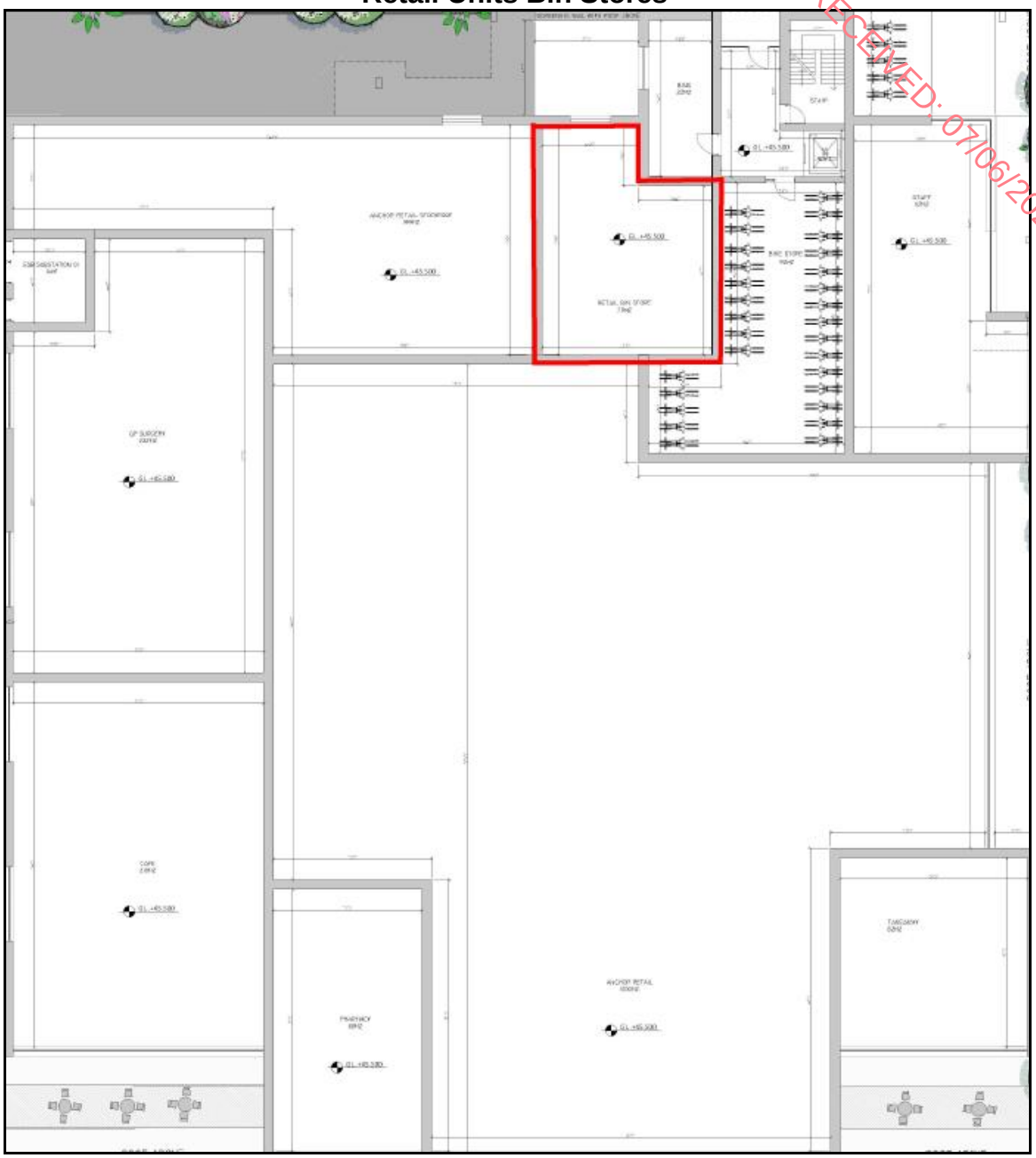
Duplex Units Bin Store Image



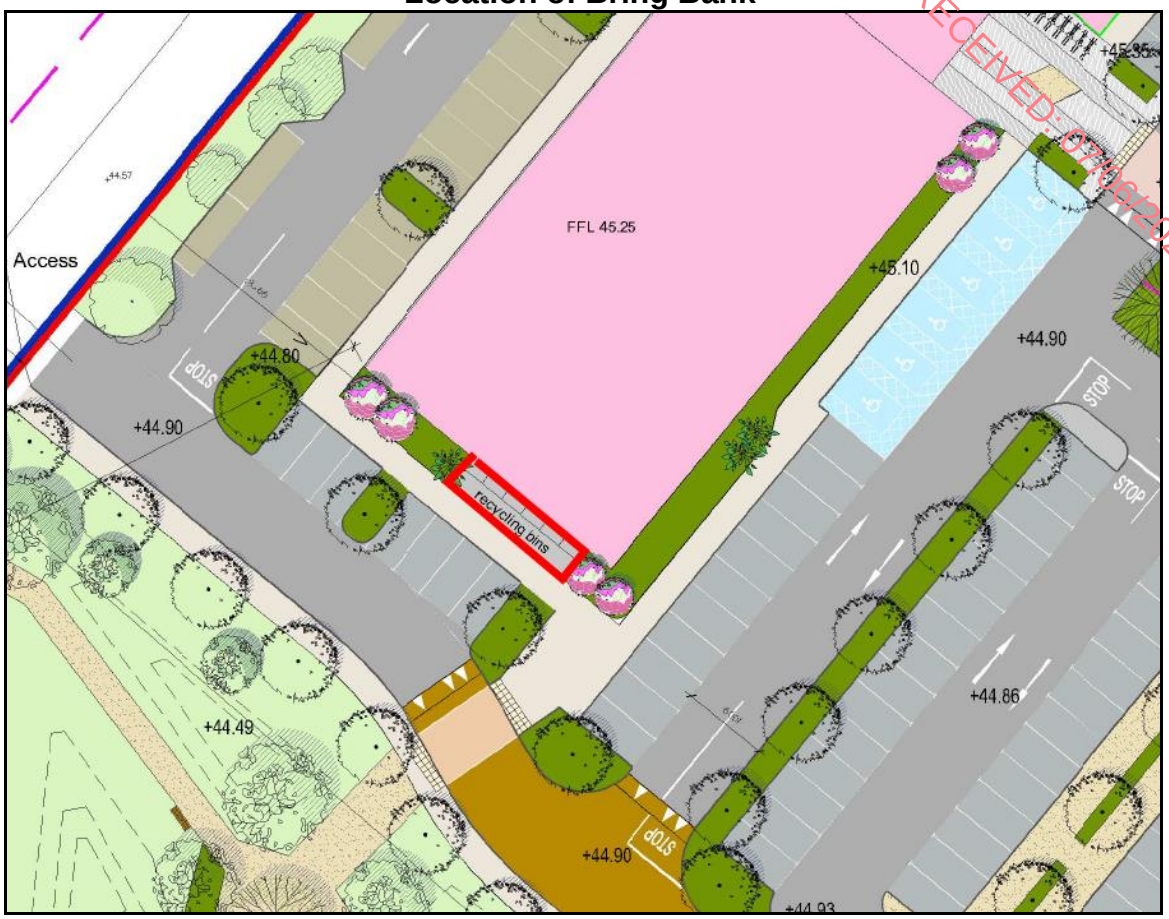
Creche Bin Store



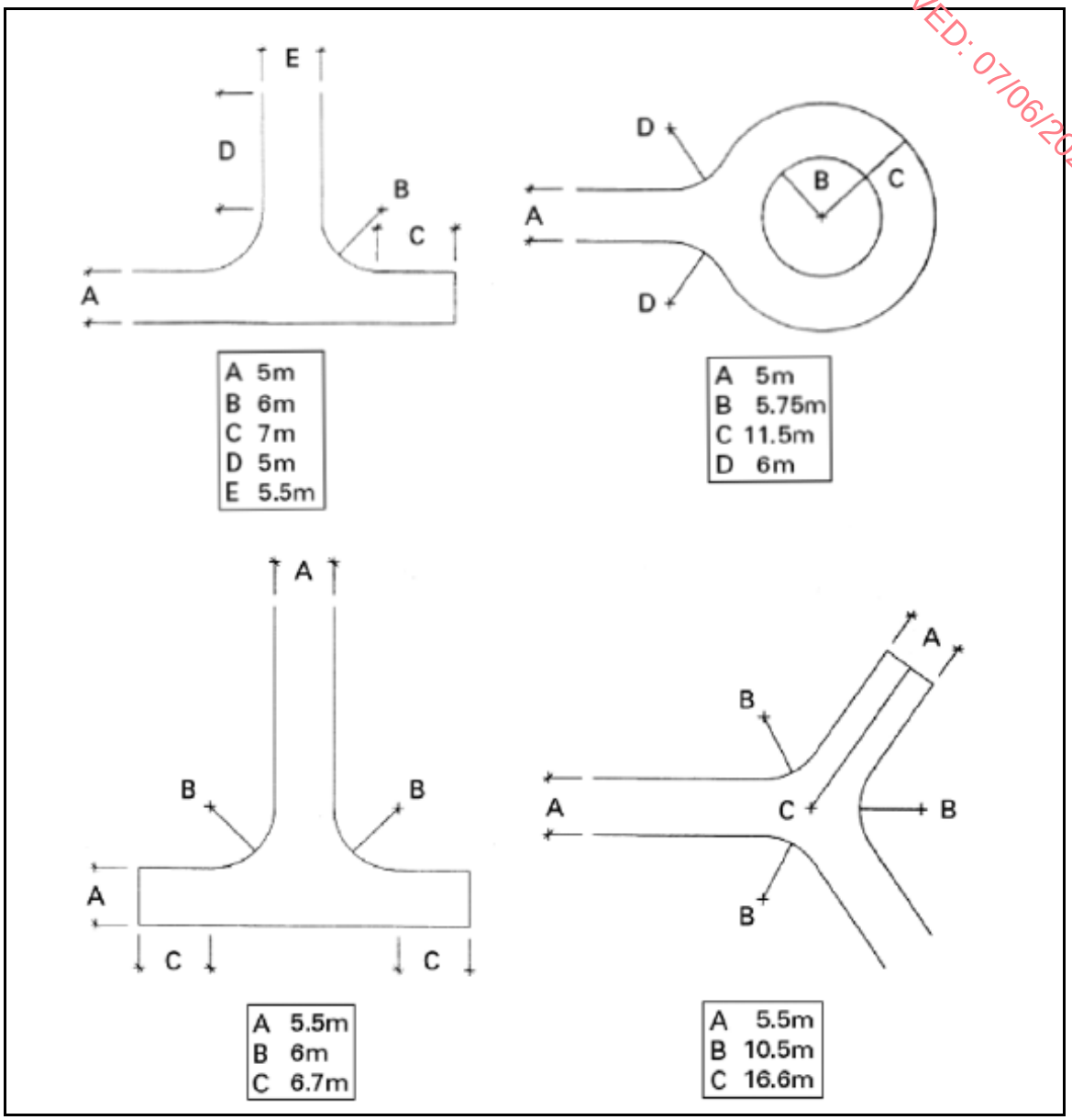
Retail Units Bin Stores

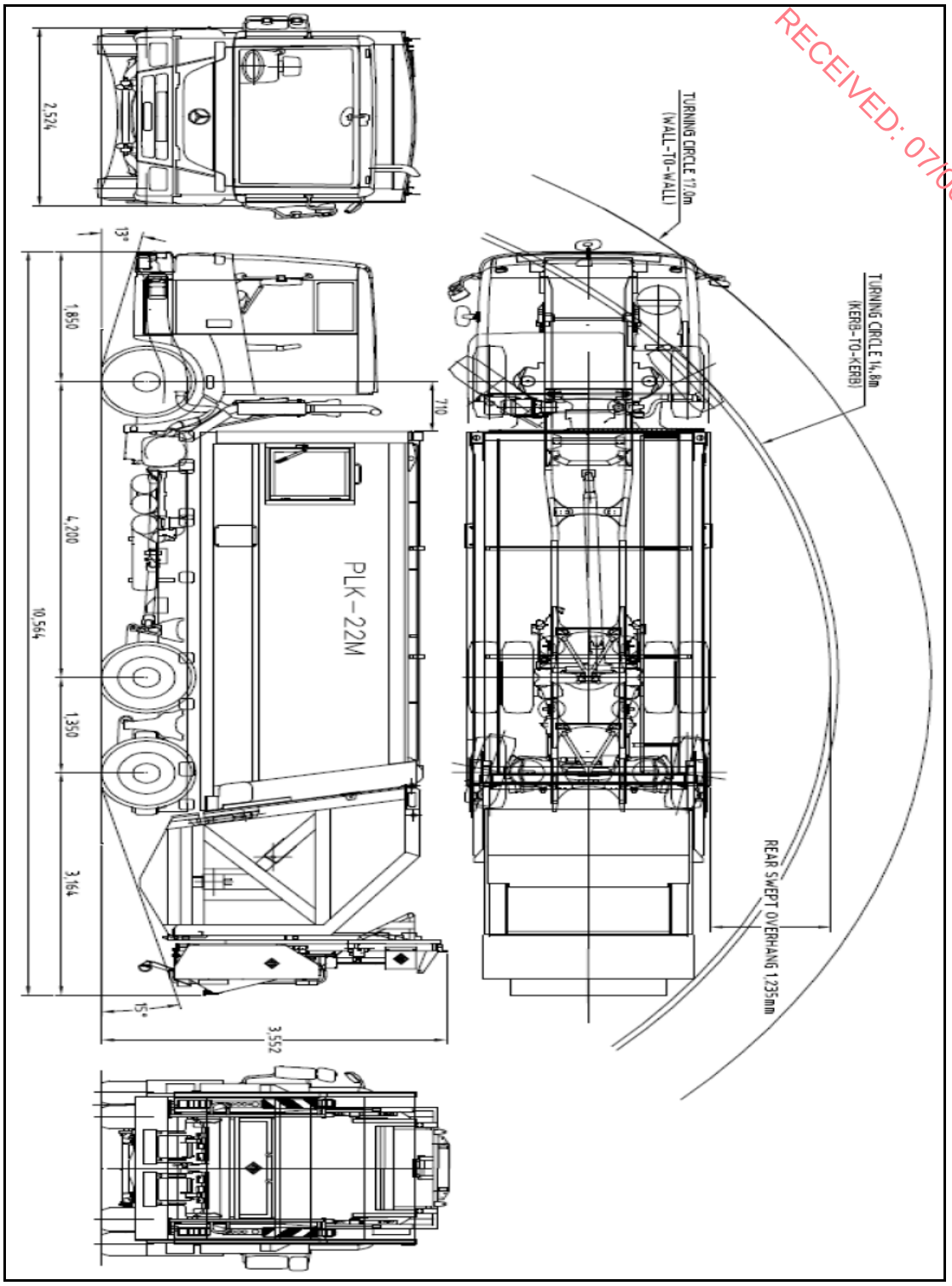


Location of Bring Bank



APPENDIX II
Bin Collection Vehicle dimensions and minimum turning requirements

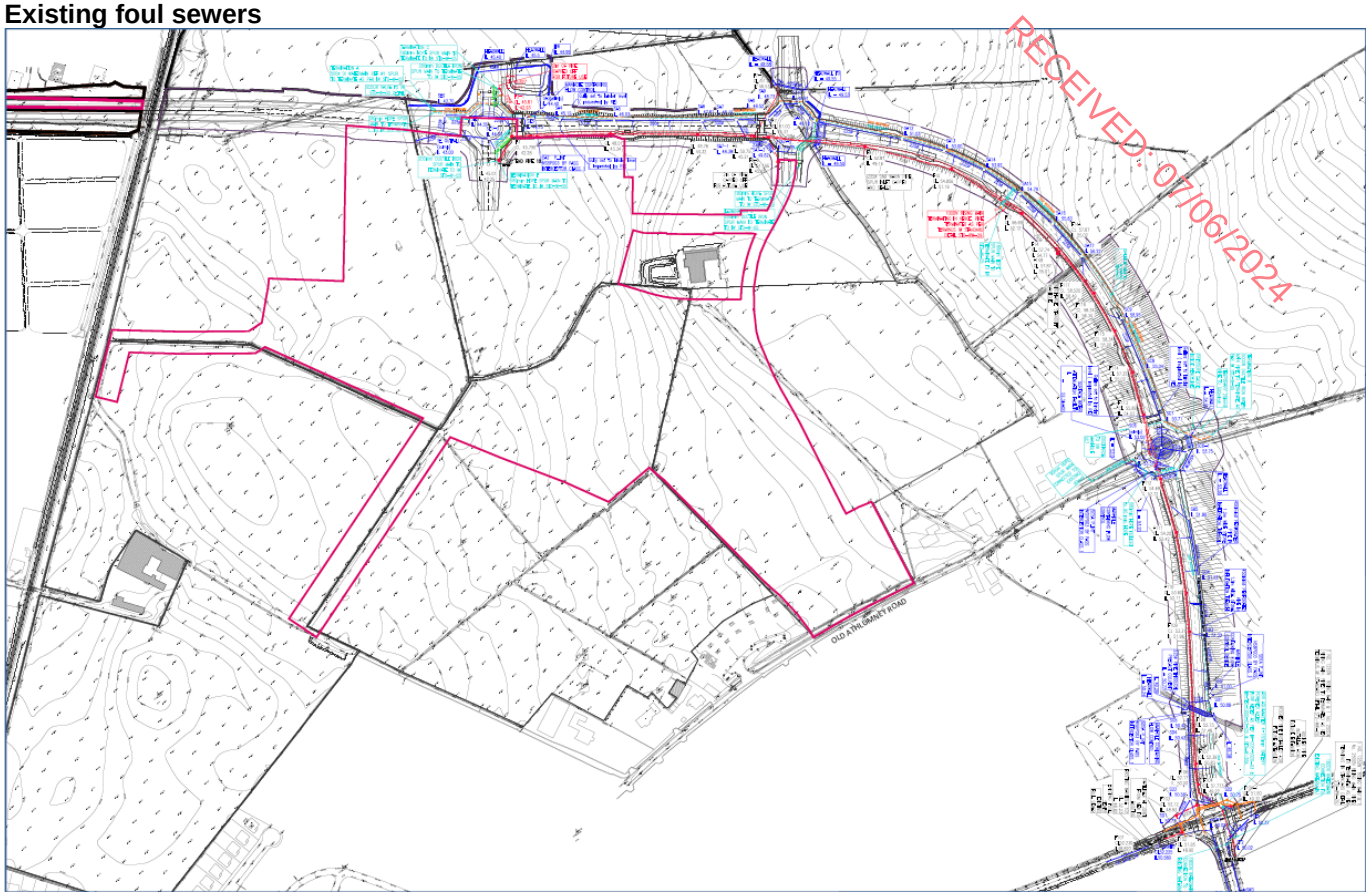




APPENDIX F – MATERIAL ASSETS – UTILITIES

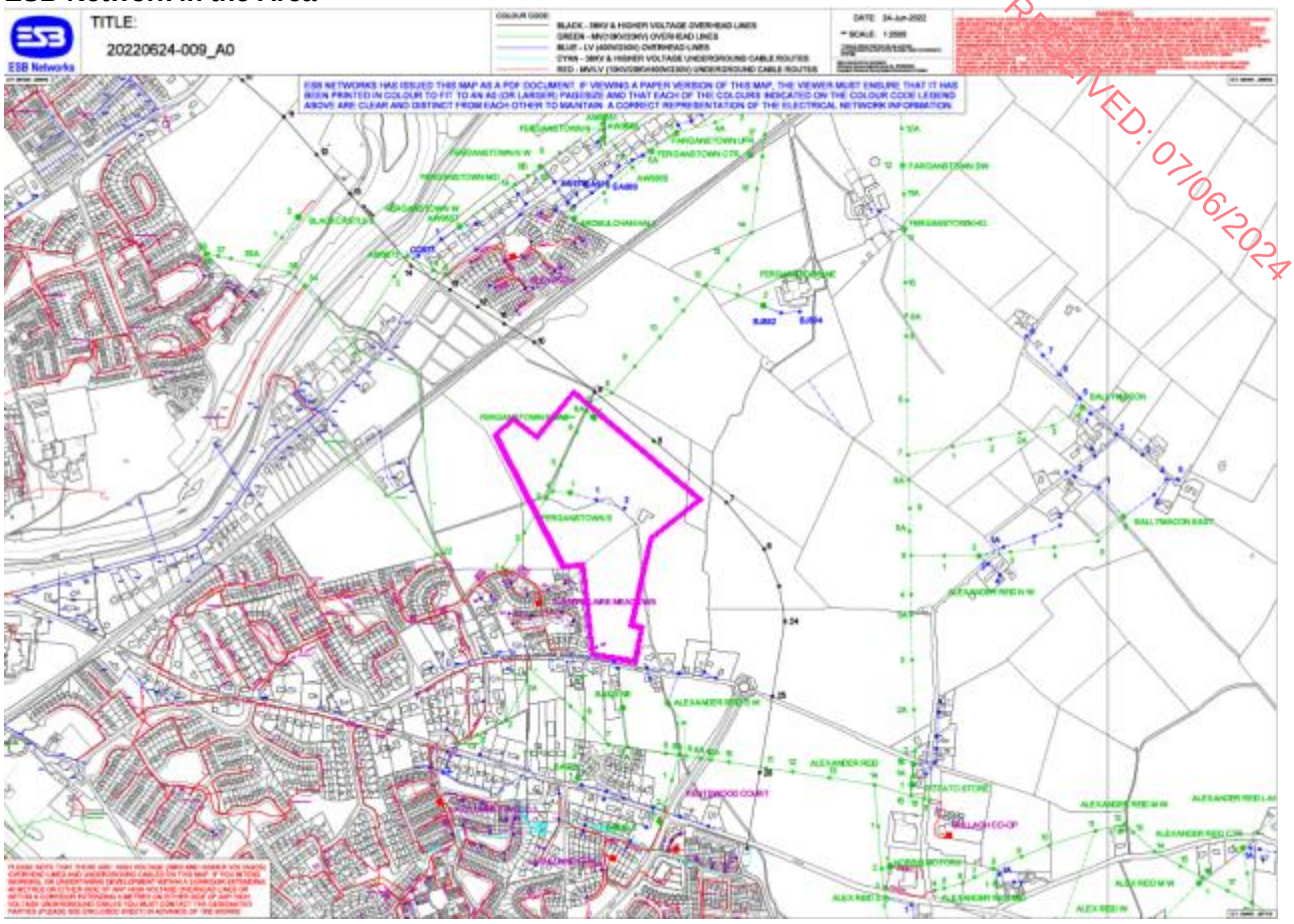
Utilities Maps

Existing foul sewers



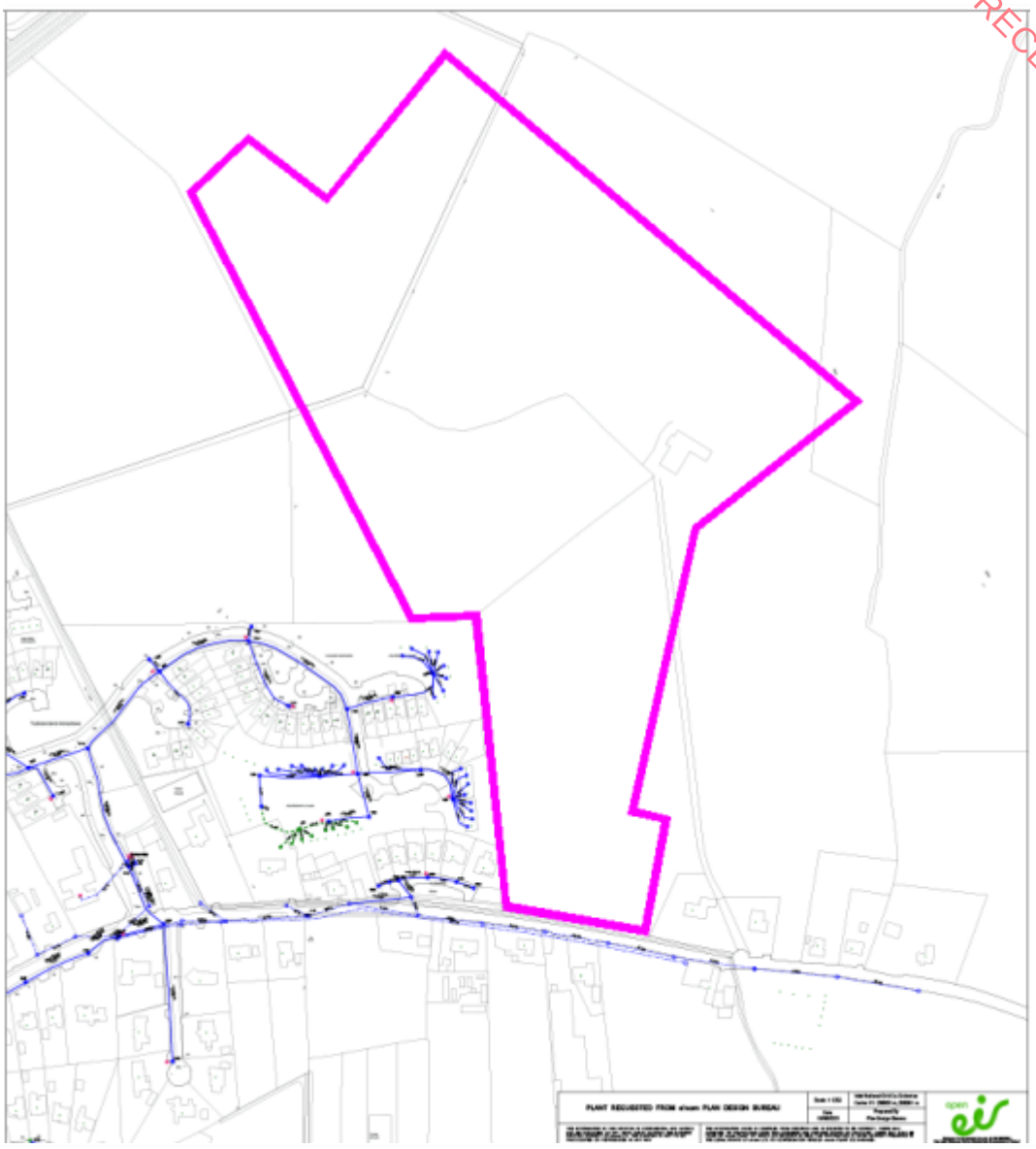
Existing services in LDR6 (Extract from Hendrick Ryan Drawing No. 2135/1b – 100 Rev. P4

ESB Network in the Area



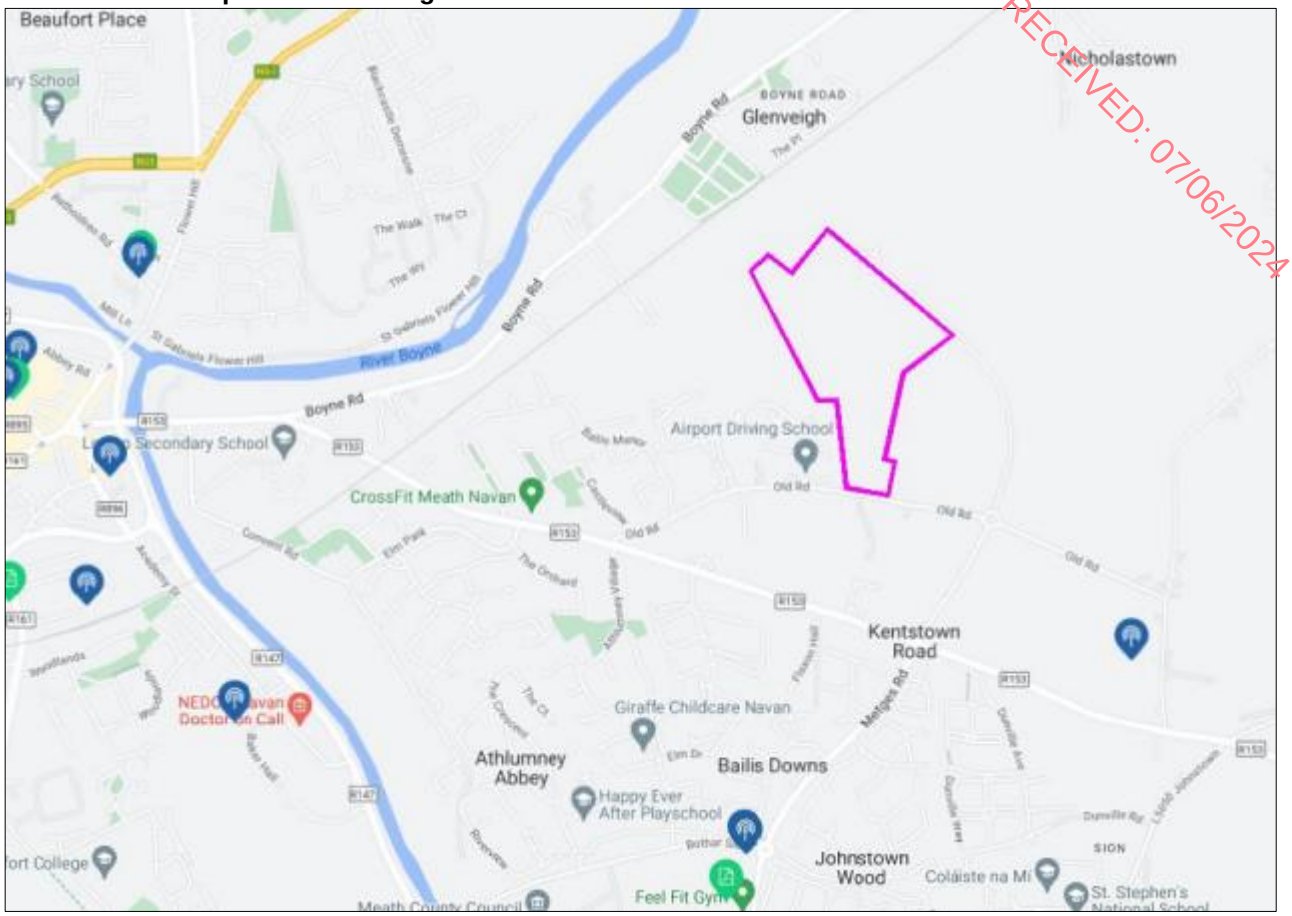
Source: Metec

Eir network



Source: Metec

Telecom Mast Map of surrounding area



Source: Metec

APPENDIX G – BIODIVERSITY

Appendix I – Legislation and Policy

International Legislation

EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland.

EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approx. 1000 species through-out Europe. The habitats and species are listed in the Directives annexes where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation (SACs) for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive from a network of protected sites called Natura 2000.

Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced in order to give protection to migratory species across borders in Europe.

Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994ha.

Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles; the second cycle ran from 2016 – 2021, and the current (third) cycle runs from 2022-2027. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high-water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least ‘good’ ecological status, through River Basin Management Plans (RBMP), by 2027.

National Legislation

Wildlife Act 1976 and amendments

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all wild birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2015 (S.I. No. 356/2015). The Flora (Protection) Order affords protection to several species of plant in Ireland, including 68 vascular plants, 40 mosses, 25 liverworts, 1 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regard to the listed species, “Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence.”

Invasive Species Legislation

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations* 2011 (SI 477 of 2011, as amended). In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

“49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace [a restricted non-native plant], shall be guilty of an offence.

49(3) … it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she […] offers or exposes for sale, transportation, distribution, introduction, or release—

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,

(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material."

National Biodiversity Action Plan 2017-2021

The National Biodiversity Plan (NBAP) 2017-2021, the third such plan for Ireland, captures the objectives, targets and actions for biodiversity that will be undertaken by a wide range of government, civil society and private sectors to achieve Ireland's Vision for Biodiversity. The NBAP provides a framework to track and assess progress towards Ireland's Vision for Biodiversity over a five-year timeframe from 2017 to 2021. To achieve the Vision, seven strategic objectives were identified in the second NBAP "Actions for Biodiversity 2011-2016". The continued implementation of the objectives from the second NBAP has been retained for the new NBAP of 2017-2021. Actions required to achieve the strategic objectives as well as the lead and key partners responsible for their implementation are set out for each of the objectives and their targets (Table A1).

The National Biodiversity Plan (NBAP) 2023-2030, the fourth such plan for Ireland, captures the objectives, targets and actions for biodiversity that will be undertaken by a wide range of government, civil society and private sectors. Actions required to achieve the strategic objectives as well as the lead and key partners responsible for their implementation are set out for each of the objectives and their outcomes (Table A1).

Table A1: Objectives and Outcomes of the National Biodiversity Action Plan 2023-2030.

Objective	Outcome
1: Adopt a Whole-of-Government, Whole-of-Society Approach to Biodiversity	1A. Governance structures and reporting outputs have improved.
	1B. Organisational capacity and resources for biodiversity have increased at all levels of Government.
	1C: Responsibility for biodiversity is shared across the whole of government.
	1D: Biodiversity initiatives are supported across the whole of society.
	1E. The legislative framework for biodiversity conservation is robust, clear and enforceable.
2: Meet Urgent Conservation and Restoration Needs	2A: The protection of existing designated areas and protected species is strengthened and conservation and restoration within the existing protected area network are enhanced.
	2B: Biodiversity and ecosystem services in the wider countryside are conserved and restored – agriculture & forestry.
	2C: Biodiversity and ecosystem services in the wider countryside are conserved and restored – peatlands & climate action.

	2D: Biodiversity and ecosystem services in the marine and freshwater environment are conserved and restored.
	2E: Genetic diversity of wild and domesticated species is safeguarded.
	2F: A National Restoration Plan is in place to contribute to the ambition of the EU Biodiversity Strategy 2030 and global restoration targets.
	2H: Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.
3. Secure Nature's Contribution to People	3A: Ireland's natural heritage and biocultural diversity is recognised, valued, enhanced and promoted in policy and practice.
	3B: The role of biodiversity in supporting wellbeing, livelihoods, enterprise and employment is recognised and enhanced.
	3C: Planning and development will facilitate and secure biodiversity's contributions to people.
4. Enhance the Evidence Base for Action on Biodiversity	4A: Research funding bodies will have an improved understanding of the research and skills required to address biodiversity research gaps.
	4B: Data relevant to biodiversity and ecosystems, including conservation needs, is widely accessible and standardised.
	4C: Long-term monitoring programmes are in place to guide conservation and restoration goals.
	4D: Ireland has prepared national assessments of ecosystem services.
5. Strengthen Ireland's Contribution to International Biodiversity Initiatives	5A: Science, policy and action on biodiversity conservation and restoration is effectively coordinated in an all-island approach.
	5B: Ireland takes action internationally to cooperate with other countries, sectors, disciplines and communities to address the biodiversity crisis.
	5C: Ireland enhances its contributions to the international biodiversity data drive.

Relevant Meath County Council Plans

The following policies and plans relate to the biodiversity within Meath County:

Meath County Development Plan 2021 – 2027

County Meath Biodiversity Action Plan 2015 – 2020

The Meath County Development Plan 2021 – 2027 has directly addressed the protection of European sites through specific policies (HER OBJ 34). The relevant recommendations and mitigation measures have been integrated into the plan. The County Meath Biodiversity Action Plan 2015 – 2020 is set out to protect and improve biodiversity, and as such will not result in negative in-combination effects with the Proposed Development. According to the Navan Development Plan 2009 – 2015, as varied “based on the conclusions of the Screening Process Meath County Council made a determination that there are no likely significant effects of theimplementation of Variation No. 3 independently and in combination with other plans and projects of any designated sites”.

Appendix II – Value of Ecological Resources

The criteria outlined in the table below, taken from the Guidelines for Assessment of Ecological Impacts of National Road Schemes published by the NRA, were used for assigning value to designated sites, habitats and species within the Site of the Proposed Development and surrounding area.

Table B1. Description of values for ecological resources based on geographic hierarchy of importance (NRA, 2009b).

Importance	Criteria
International Importance	'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). - Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & The Biosphere Programme) Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve.

Importance	Criteria
	Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive
County Importance	Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared; Resident or regularly occurring populations (assessed to be important at the Local level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds

Importance	Criteria
	Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or o Species listed on the relevant Red Data list. Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that is of some importance in maintaining habitat links.

Appendix III – EPA Impact Assessment Criteria

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects:

Quality	Definition
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities)
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).

Criteria used to define significance of effects.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying significance of impacts:

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Criteria used to define duration of effects.

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects:

Quality of Effects	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years
Medium term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Appendix IV – Site Photographs

Figure 4.1. Improved Agricultural Grassland GA1 habitat on Site

Figure 4.2. Arable Crop BC1 within the centre of the Site, bounded by Treeline WL2 habitat (left)

Figure 4.3. Hedgerow WL1 habitat separating the residential estate bounding the southwest area of the Site

Figure 4.4. Drainage Ditch FW4 habitat observed beneath the hedgerow extending north from the arable field on Site

Figure 4.5. Badger recorded at Sett entrance on Site

Appendix IV – Bat Detector Metadata

Full bat survey metadata 21st of September 2022 (Analysis carried out using Elekon BatExplorer 2.0 Software)

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180006	21/09/2022 19:40	Pipistrellus pygmaeus	1	57.8	64.5	56.6	4.3	0	17	53.65456	-6.6547
2180007	21/09/2022 19:40	Pipistrellus pygmaeus	15	58	66.7	57	3	80	17	53.65458	-6.6547
2180008	21/09/2022 19:40	Pipistrellus pygmaeus	17	57.1	71.6	56.4	6	80	17	53.65459	-6.65472
2180009	21/09/2022 19:40	Pipistrellus pygmaeus	37	57.8	93.2	57	5	80	17	53.65463	-6.65472
2180010	21/09/2022 19:40	Pipistrellus pygmaeus	6	53.5	86.4	52.6	6	179	17	53.65472	-6.65466
2180011	21/09/2022 19:40	Pipistrellus pygmaeus	52	58.4	93.9	57.5	5	80	17	53.65472	-6.65464
2180012	21/09/2022 19:41	Pipistrellus pygmaeus	47	57.5	90.4	56.7	6	85	17	53.65472	-6.65464
2180013	21/09/2022 19:41	Pipistrellus pygmaeus	22	58.8	85.2	57.6	4	70	17	53.65473	-6.65464
2180014	21/09/2022 19:41	Pipistrellus pygmaeus	4	58.8	66.7	58.2	4	100	17	53.65475	-6.65462
02180021_1	21/09/2022 19:47	Nyctalus leisleri	1	24.8	25.1	24	9.1	0	17	53.6551	-6.6526

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
02180021_2	21/09/2022 19:47	Pipistrellus pygmaeus	5	51.4	54.6	50.3	6.7	163	17	53.6551	-6.6526
2180023	21/09/2022 19:48	Pipistrellus pipistrellus	3	44.9	46.1	44	5	211	17	53.65545	-6.65326
2180025	21/09/2022 19:49	Pipistrellus pygmaeus	42	48.9	53.7	47.7	7	85	18	53.65552	-6.6534
02180025_2	21/09/2022 19:49	Pipistrellus pipistrellus	42	48.9	53.7	47.7	7	85	18	53.65552	-6.6534
2180030	21/09/2022 19:59	Pipistrellus pipistrellus	24	47	48.5	46.4	7	103	16	53.65508	-6.65249
2180031	21/09/2022 19:59	Nyctalus leisleri	3	22.5	23.4	20.8	22.2	401	16	53.65517	-6.65254
2180032	21/09/2022 19:59	Nyctalus leisleri	4	21.5	21.8	20.1	18.3	413	16	53.65519	-6.65255
2180033	21/09/2022 19:59	Nyctalus leisleri	6	21.9	22.9	20.8	18	317	16	53.65518	-6.65255
2180034	21/09/2022 19:59	Nyctalus leisleri	3	21.1	21.9	19.6	20.4	483	16	53.65518	-6.65255
2180035	21/09/2022 19:59	Pipistrellus pygmaeus	25	51.8	55.9	51.1	6	80	16	53.65518	-6.65255
2180040	21/09/2022 20:01	Pipistrellus pygmaeus	12	52.6	58.6	51.5	7	85	16	53.65561	-6.65328
2180041	21/09/2022 20:01	Pipistrellus pygmaeus	14	54.7	87.5	53.5	6	80	16	53.65562	-6.65331

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180056	21/09/2022 20:07	Pipistrellus pipistrellus	23	47.7	83.6	46.7	3	90	16	53.6571	-6.65497
2180057	21/09/2022 20:08	Pipistrellus pipistrellus	1	46.5	55.5	45.8	3.7	0	16	53.65726	-6.65542
2180058	21/09/2022 20:08	Pipistrellus pipistrellus	13	47.7	57.4	46.8	3	90	16	53.65727	-6.65549
2180059	21/09/2022 20:08	Pipistrellus pipistrellus	4	48.2	54.3	46.7	4.3	113	16	53.6573	-6.65554
2180060	21/09/2022 20:08	Pipistrellus pipistrellus	24	47	59.8	46.4	4	90	16	53.6573	-6.65555
2180061	21/09/2022 20:08	Pipistrellus pipistrellus	44	47.1	60.2	46.3	5	90	16	53.6573	-6.65557
2180062	21/09/2022 20:08	Pipistrellus pipistrellus	99	47.5	76.6	46.7	4	80	16	53.65733	-6.65564
02180063_1	21/09/2022 20:08	Pipistrellus pygmaeus	20	57.8	80.1	54.2	3	40	16	53.65737	-6.65577
02180063_2	21/09/2022 20:08	Pipistrellus pipistrellus	19	48.5	91.8	47.8	5	86	16	53.65737	-6.65577
2180065	21/09/2022 20:09	Pipistrellus pipistrellus	12	46.8	55	46.3	4	100	16	53.65744	-6.65598
2180066	21/09/2022 20:10	Pipistrellus pipistrellus	20	47.9	63.7	47.2	4	90	16	53.65743	-6.65587
2180067	21/09/2022 20:10	Pipistrellus pipistrellus	8	46.4	54.3	45.8	4	180	16	53.65742	-6.65585

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180068	21/09/2022 20:10	Pipistrellus pipistrellus	8	48.1	58	47.3	3	90	16	53.6574	-6.65581
2180069	21/09/2022 20:10	Pipistrellus pipistrellus	4	48	54.6	47	3	340	16	53.65739	-6.6558
2180070	21/09/2022 20:10	Pipistrellus pipistrellus	28	48.5	78.9	47.7	4	84	16	53.65738	-6.65578
2180071	21/09/2022 20:10	Pipistrellus pipistrellus	4	48.1	56.3	47.3	6.7	503	16	53.65735	-6.65574
2180072	21/09/2022 20:10	Pipistrellus pipistrellus	31	47.7	74.9	46.9	4	90	16	53.65734	-6.65572
2180073	21/09/2022 20:10	Pipistrellus pipistrellus	17	47.6	80	46.9	5	100	16	53.65732	-6.65566
2180075	21/09/2022 20:11	Pipistrellus pygmaeus	25	54.3	80.3	53.6	6	84	16	53.65714	-6.65502
2180076	21/09/2022 20:11	Pipistrellus pipistrellus	22	44.6	65.1	43.8	5	90	16	53.6571	-6.65497
2180077	21/09/2022 20:12	Pipistrellus pipistrellus	28	47.6	58.4	46.5	6	100	16	53.65703	-6.65481
2180078	21/09/2022 20:12	Pipistrellus pygmaeus	62	54.5	70.2	53.7	5	84	16	53.65697	-6.65465
2180079	21/09/2022 20:13	Pipistrellus pipistrellus	2	21.8	27.4	20.6	7.5	0	16	53.65671	-6.65389
2180080	21/09/2022 20:13	Pipistrellus pipistrellus	8	46.5	51.9	45.9	4	214	16	53.65668	-6.65382

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180081	21/09/2022 20:14	Pipistrellus pipistrellus	57	46.6	55.2	45.7	5	90	16	53.65666	-6.65375
2180082	21/09/2022 20:14	Pipistrellus pipistrellus	23	47.3	58.6	46.5	4	85	16	53.65665	-6.65376
2180083	21/09/2022 20:14	Pipistrellus pipistrellus	44	46.8	61.6	45.9	5	90	16	53.65665	-6.65376
2180084	21/09/2022 20:14	Pipistrellus pipistrellus	14	46.6	61.9	45.8	6	100	16	53.65663	-6.65372
2180085	21/09/2022 20:14	Pipistrellus pipistrellus	11	45.6	51.3	44.9	6	147	16	53.65663	-6.65373
2180087	21/09/2022 20:14	Pipistrellus pipistrellus	45	46.5	61.4	45.7	5	95	16	53.65663	-6.65369
2180088	21/09/2022 20:14	Pipistrellus pipistrellus	8	46.1	50.8	45.5	4	309	16	53.65661	-6.65364
2180089	21/09/2022 20:15	Pipistrellus pipistrellus	38	47	63	46	6	96	16	53.65658	-6.65358
02180090_1	21/09/2022 20:15	Pipistrellus pygmaeus	17	53.3	56.6	52.4	7	227	16	53.65655	-6.6535
02180090_3	21/09/2022 20:15	Pipistrellus pipistrellus	1	46.1	59.6	45.8	5.9	0	16	53.65655	-6.6535
2180091	21/09/2022 20:15	Pipistrellus pipistrellus	3	48	57.9	45.8	5.6	263	16	53.65654	-6.65347
2180092	21/09/2022 20:15	Pipistrellus pipistrellus	22	46.6	62.9	45.4	6	100	16	53.65651	-6.65344

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180093	21/09/2022 20:15	Pipistrellus pipistrellus	15	47.6	83	46.9	5	94	16	53.65641	-6.65316
2180094	21/09/2022 20:16	Pipistrellus pygmaeus	3	55.3	64.1	54.8	4.4	158	16	53.65631	-6.65292
2180095	21/09/2022 20:16	Pipistrellus pygmaeus	25	55.1	75.6	54.5	5	80	16	53.6563	-6.65289
2180097	21/09/2022 20:18	Pipistrellus pipistrellus	24	48	77.9	47.2	4	83	16	53.65615	-6.65242
2180098	21/09/2022 20:18	Pipistrellus pygmaeus	3	53.8	64.8	53	5.9	495	16	53.65617	-6.65252
2180099	21/09/2022 20:18	Pipistrellus pipistrellus	5	45.2	48.2	44.5	7.3	228	16	53.6562	-6.65259
2180100	21/09/2022 20:18	Pipistrellus pipistrellus	17	45.6	48.8	44.3	8	180	16	53.65621	-6.65261
2180101	21/09/2022 20:19	Pipistrellus pipistrellus	10	46.3	52.5	45.5	6	100	16	53.6564	-6.65317
2180102	21/09/2022 20:19	Pipistrellus pipistrellus	3	46.8	51.8	45.9	5.5	184	16	53.65644	-6.65327
2180103	21/09/2022 20:19	Pipistrellus pipistrellus	12	48.8	61	47.8	3	80	16	53.65644	-6.65328
2180104	21/09/2022 20:19	Pipistrellus pipistrellus	10	47.7	57.2	47	3	219	16	53.65646	-6.65334
2180105	21/09/2022 20:19	Pipistrellus pipistrellus	26	47.4	65.9	46.4	5	84	16	53.65648	-6.65338

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180106	21/09/2022 20:19	Pipistrellus pipistrellus	39	47	59.8	46	6	90	16	53.65651	-6.65343
2180107	21/09/2022 20:19	Pipistrellus pipistrellus	6	47.1	59.9	45.9	6	179	16	53.65655	-6.65355
2180108	21/09/2022 20:19	Pipistrellus pipistrellus	7	48.3	76.3	47.5	4	112	16	53.65656	-6.65358
2180109	21/09/2022 20:20	Pipistrellus pygmaeus	19	57.4	72.6	56.1	3	160	16	53.65675	-6.65408
2180110	21/09/2022 20:21	Pipistrellus pygmaeus	20	56.4	67.8	55.7	6	90	16	53.65688	-6.65441
2180115	21/09/2022 20:28	Pipistrellus pygmaeus	10	55	81.7	54	6	194	16	53.6557	-6.65729
2180116	21/09/2022 20:36	Nyctalus leisleri	3	24.5	25.9	24	10.8	707	16	53.65502	-6.65457
2180117	21/09/2022 20:36	Nyctalus leisleri	2	25.7	26.6	24.8	6.9	503	16	53.655	-6.65455
2180118	21/09/2022 20:36	Nyctalus leisleri	4	22.2	22.8	21.5	17.6	607	16	53.655	-6.65455
2180119	21/09/2022 20:36	Pipistrellus pygmaeus	28	57.2	71.7	56.5	5	170	16	53.65491	-6.65448
2180120	21/09/2022 20:36	Pipistrellus pygmaeus	8	57	70.9	56	6	161	16	53.65484	-6.65454
2180121	21/09/2022 20:37	Nyctalus leisleri	6	24.1	26.1	22.8	9.6	578	16	53.6548	-6.6546

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180122	21/09/2022 20:37	Nyctalus leisleri	6	25.4	27.6	24.3	7	374	16	53.65479	-6.65461
2180125	21/09/2022 20:40	Pipistrellus pygmaeus	21	57.8	70.5	57	5	93	16	53.65457	-6.65482
2180126	21/09/2022 20:40	Pipistrellus pygmaeus	20	56.5	72.2	55.8	6	85	16	53.65456	-6.65488
2180127	21/09/2022 20:40	Pipistrellus pygmaeus	21	58	73.9	57.1	4	85	16	53.65456	-6.65489
2180128	21/09/2022 20:41	Pipistrellus pygmaeus	22	57.8	92	57	5	80	16	53.6545	-6.65508
2180129	21/09/2022 20:41	Pipistrellus pygmaeus	90	57.3	83.2	56	6	85	16	53.6545	-6.65509
2180130	21/09/2022 20:41	Pipistrellus pygmaeus	10	56.3	72.9	55.3	6	136	16	53.65451	-6.65507
2180131	21/09/2022 20:41	Pipistrellus pygmaeus	33	58.2	99.2	56	5	85	16	53.65451	-6.65507
2180132	21/09/2022 20:41	Pipistrellus pygmaeus	27	56.9	77.3	56.2	5	90	16	53.65452	-6.65506
2180133	21/09/2022 20:42	Pipistrellus pygmaeus	9	57.1	68.5	56.3	6	128	16	53.65452	-6.65505
2180134	21/09/2022 20:42	Pipistrellus pygmaeus	38	57.3	83.7	56.2	6	85	16	53.65452	-6.65506
2180135	21/09/2022 20:42	Pipistrellus pygmaeus	0	0	0	0	0	0	16	53.65451	-6.65508

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180136	21/09/2022 20:42	Pipistrellus pygmaeus	47	57.5	82.4	56.1	5	84	16	53.6545	-6.65508
2180137	21/09/2022 20:42	Pipistrellus pygmaeus	10	57.7	67.8	56.5	5	300	16	53.65452	-6.65508
2180138	21/09/2022 20:42	Pipistrellus pygmaeus	1	55.1	61.1	54.4	6.9	0	16	53.65455	-6.65508
2180139	21/09/2022 20:42	Pipistrellus pygmaeus	1	58.1	69.4	56.6	8.5	0	16	53.65456	-6.65508
2180140	21/09/2022 20:42	Pipistrellus pygmaeus	8	56.8	64.9	55.7	6	282	16	53.65456	-6.65507
2180141	21/09/2022 20:42	Pipistrellus pygmaeus	1	57.4	63.4	56.6	10.1	0	16	53.65455	-6.65507
02180142_1	21/09/2022 20:42	Pipistrellus pygmaeus	18	56.6	62.6	55.7	5	90	16	53.65455	-6.65507
02180142_2	21/09/2022 20:42	Nyctalus leisleri	2	24	27	23.1	10.9	718	16	53.65455	-6.65507
02180143_1	21/09/2022 20:42	Pipistrellus pygmaeus	20	56.8	70.1	55.8	6	190	16	53.65455	-6.65507
02180143_2	21/09/2022 20:42	Nyctalus leisleri	13	23	25.3	21.5	15	720	16	53.65455	-6.65507
2180144	21/09/2022 20:43	Pipistrellus pygmaeus	3	56.1	66	55.5	7.8	241	16	53.65455	-6.65508
2180145	21/09/2022 20:43	Pipistrellus pygmaeus	7	56.7	67.8	56	6	190	16	53.65456	-6.65507

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180146	21/09/2022 20:43	Pipistrellus pygmaeus	32	56.8	71.9	56	5	90	16	53.65456	-6.65507
2180147	21/09/2022 20:43	Pipistrellus pygmaeus	19	56.7	65.5	55.8	6	96	16	53.65458	-6.65507
2180150	21/09/2022 20:43	Pipistrellus pygmaeus	22	57.7	79.5	56.6	5	70	16	53.65458	-6.65499
2180151	21/09/2022 20:44	Pipistrellus pygmaeus	0	0	0	0	0	0	16	53.6546	-6.65476
2180152	21/09/2022 20:45	Pipistrellus pipistrellus	29	47.1	51.2	46.6	4	90	17	53.655	-6.65424
2180153	21/09/2022 20:46	Pipistrellus pipistrellus	23	45.3	60.9	44.6	6	100	17	53.65502	-6.65407
2180156	21/09/2022 20:55	Pipistrellus pygmaeus	20	51.8	59.3	51.2	6	90	17	53.65533	-6.65201
2180170	21/09/2022 20:58	Pipistrellus pipistrellus	19	47.5	59.1	46.7	6	230	16	53.65532	-6.65202

Full bat survey metadata 4th of October 2022 (Analysis carried out using Elekon BatExplorer 2.0 Software)

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
2180013	04/10/2022 19:28	Pipistrellus pygmaeus	8	57.2	73.3	56.2	5.6	168	14	53.65484	-6.65456
2180014	04/10/2022 19:28	Pipistrellus pygmaeus	8	57.6	72.4	56.7	4	90	14	53.65483	-6.65457
2180015	04/10/2022 19:28	Pipistrellus pygmaeus	8	57.4	72.7	56.3	6	120	14	53.65483	-6.65457
2180016	04/10/2022 19:28	Pipistrellus pygmaeus	15	57.2	86.6	56.2	5	160	15	53.65479	-6.65463
2180017	04/10/2022 19:28	Pipistrellus pygmaeus	20	59	93.1	56.5	4	172	15	53.65476	-6.65463
2180018	04/10/2022 19:29	Pipistrellus pygmaeus	29	58.4	96.1	56.2	4	76	15	53.65473	-6.65457
2180019	04/10/2022 19:29	Pipistrellus pygmaeus	45	57.2	89.5	55.9	5	80	15	53.65473	-6.65457
2180020	04/10/2022 19:29	Pipistrellus pygmaeus	5	56.9	81.5	55.7	3.9	146	15	53.65475	-6.65458
2180021	04/10/2022 19:29	Pipistrellus pygmaeus	27	57.7	87	56.1	4	85	15	53.65474	-6.65459
2180022	04/10/2022 19:29	Pipistrellus pygmaeus	25	57.4	82.9	56	5	86	15	53.65474	-6.65463
2180023	04/10/2022 19:29	Pipistrellus pygmaeus	42	59.2	94.2	55.9	4	80	15	53.65473	-6.65458
2180024	04/10/2022	Pipistrellus	31	57.3	94.3	56.2	5	170	15	53.65473	-6.65454

Recording	Timestamp	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature	Latitude [WGS84]	Longitude [WGS84]
	19:30	pygmaeus									
2180025	04/10/2022 19:30	Pipistrellus pygmaeus	45	57.7	93.3	56.4	4	73	15	53.65472	-6.65452
2180026	04/10/2022 19:30	Pipistrellus pygmaeus	16	57.8	90.3	56.3	5	85	15	53.65473	-6.65448
2180027	04/10/2022 19:30	Pipistrellus pygmaeus	23	57.7	82.2	56.3	6	80	15	53.65475	-6.65452
2180028	04/10/2022 19:30	Pipistrellus pygmaeus	40	59.3	95.1	56.8	4	80	15	53.65474	-6.65456
2180029	04/10/2022 19:30	Pipistrellus pygmaeus	9	61.2	89.8	60.1	4	70	15	53.65472	-6.65456
2180030	04/10/2022 19:31	Pipistrellus pygmaeus	2	61.7	66.2	60.6	2.1	87	15	53.65474	-6.65449
2180031	04/10/2022 19:31	Pipistrellus pygmaeus	16	58.5	70.4	56.9	6	160	15	53.65474	-6.65445
2180032	04/10/2022 19:31	Pipistrellus pygmaeus	2	58.7	64.5	57	4.8	172	15	53.65472	-6.65448
2180033	04/10/2022 19:31	Pipistrellus pygmaeus	0	0	0	0	0	0	15	53.6547	-6.65452
2180048	04/10/2022 20:10	Pipistrellus pygmaeus	2	24.8	25.5	21.8	4.3	0	15	53.65454	-6.65465
2180055	04/10/2022 20:27	Pipistrellus pygmaeus	19	57.6	65.3	56.5	5	80	15	53.65583	-6.65373

APPENDIX H – VERIFIED VIEWS/PHOTOMONTAGES

3D Design Bureau

View 1 Existing

View 1 Proposed

View 2 Existing

View 2 Proposed

View 3 Existing

View 3 Proposed

View 4 Existing

View 4 Proposed

View 5 Existing

View 5 Proposed

View 6 Existing

View 6 Proposed

View 7 Existing

View 7 Proposed

View 8 Existing

View 8 Proposed

View 9 Existing

View 9 Proposed

View 10 Existing

View 10 Proposed

View 11 Existing

View 11 Proposed

View 12 Existing

View 12 Proposed