NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.
This drawing is based upon drawing PE18001-CWO-ZZ-00-DR-A-001100, received 15/11/23. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

NRB Consulting Engineers Ltd
1st Floor, Apollo Building
Dundrum Road
Dundrum
Dublin 14

Phone/Fax: +353 1 292 1941
Email: info@nrb.ie
Web: www.nrb.ie
Registered in Ireland No. 491679

Client

Project: Greenvale LRD
Dublin

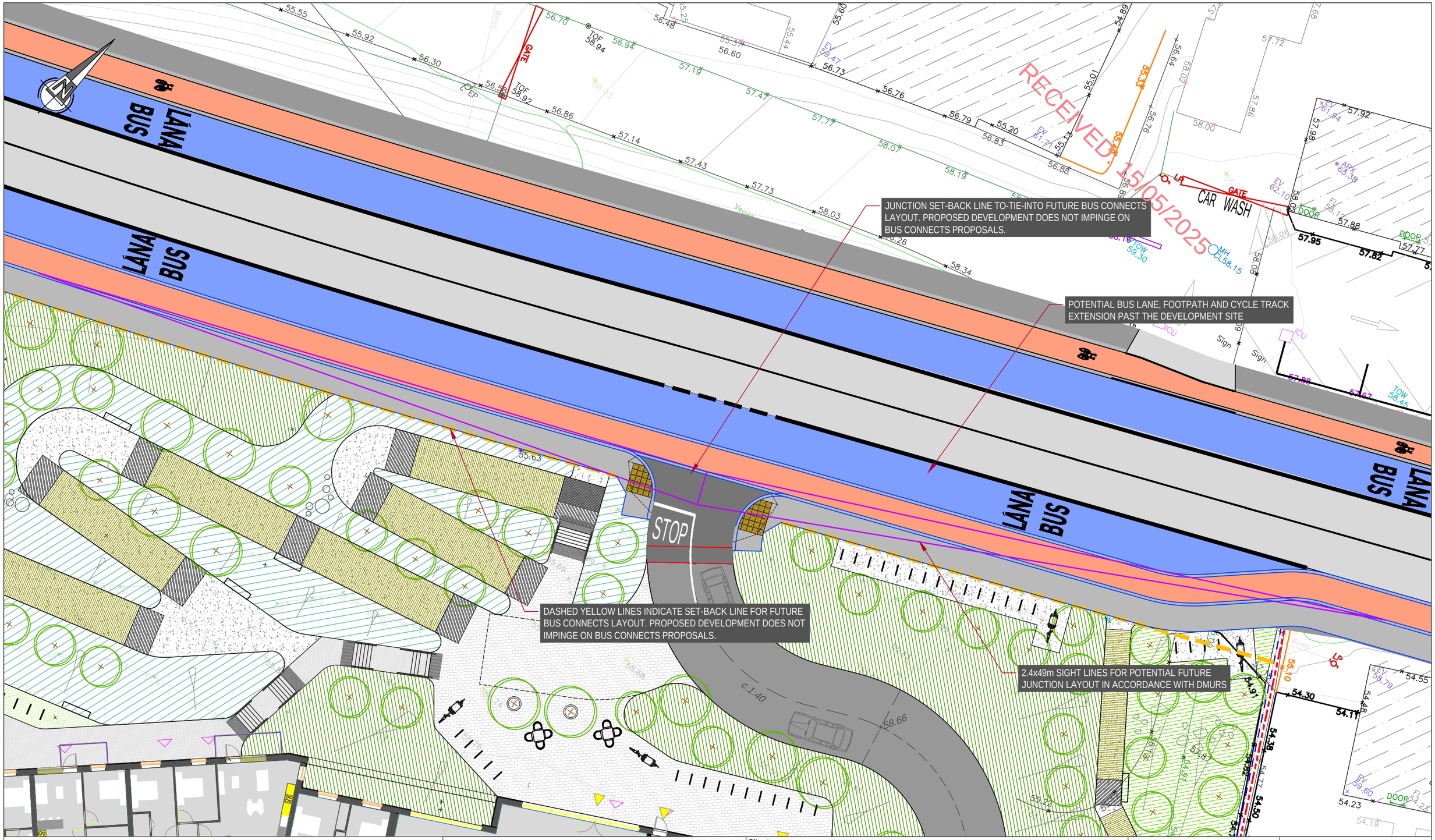
Title: Illustration of Proposed Site Layout
With Future BusConnects Layout Overlaid

Project No.	Drawing No.
22-087	NRB-TA-011

Drawn	Checked	Approved
PB	BMcM 05/12/23	BMcM 05/12/23

Date	Scale @ A3	Rev
5-Dec-23	1:1000	A

Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction



NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.
This drawing is based upon drawing PE18001-CWO-ZZ-00-DR-A-001100, received 15/11/23. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

NRB Consulting Engineers Ltd
1st Floor, Apollo Building
Dundrum Road
Dundrum
Dublin 14

Phone/Fax: +353 1 292 1941
Email: info@nrb.ie
Web: www.nrb.ie
Registered in Ireland No. 491679

NRB consulting engineers

Client

Project: Greenvale LRD, Dublin

Title: Illustration of Greenhills Road Junction With Future BusConnects Layout Overlaid

Project No.	Drawing No.
22-087	NRB-TA-012

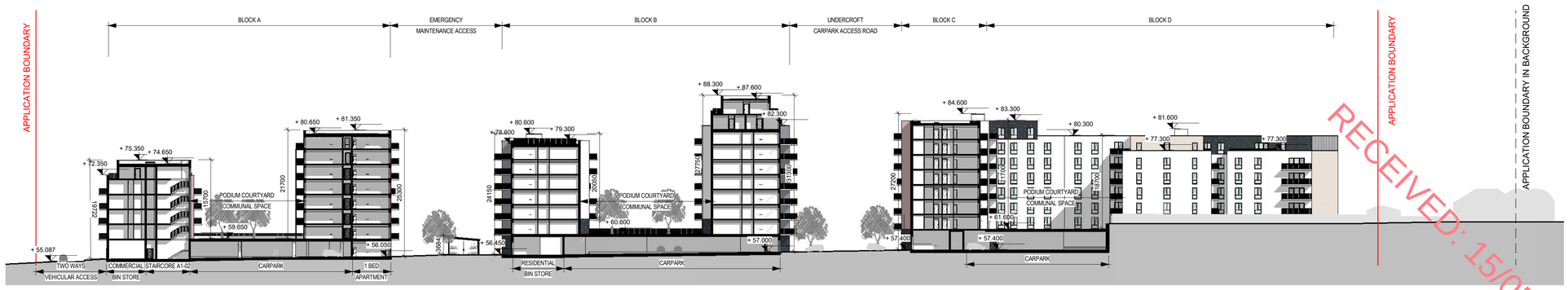
Drawn	Checked	Approved
PB	BMcM 05/12/23	BMcM 05/12/23

Date	Scale @ A3	Rev
5-Dec-23	1:250	A

Purpose of Issue: ☐ Draft ☐ Information ☐ Approval ☐ As Built ☐ Tender ☐ Construction

NOTES:

PLANNING DRAWING



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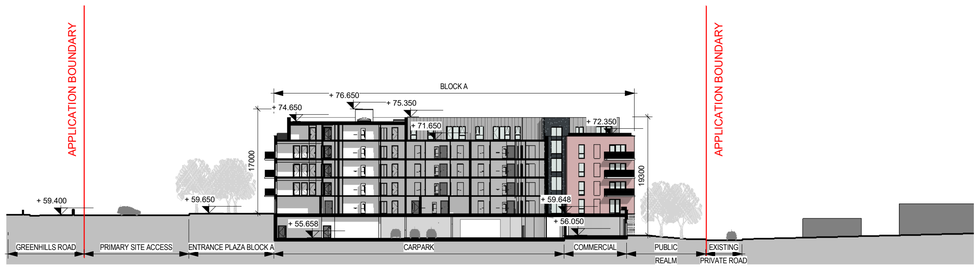

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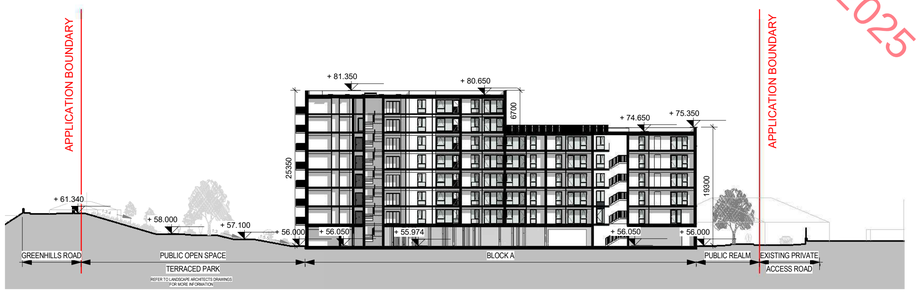

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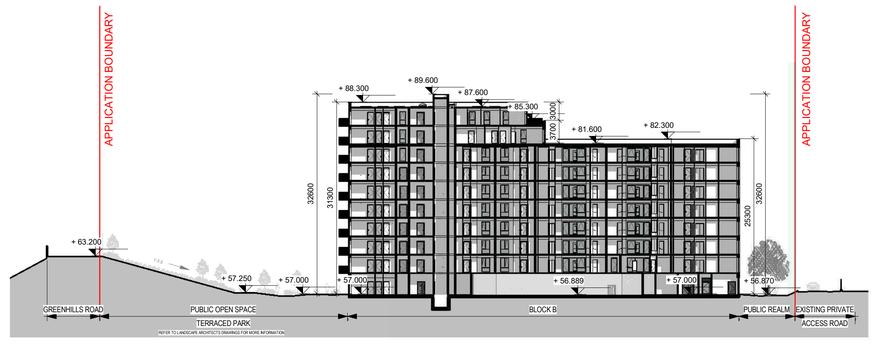

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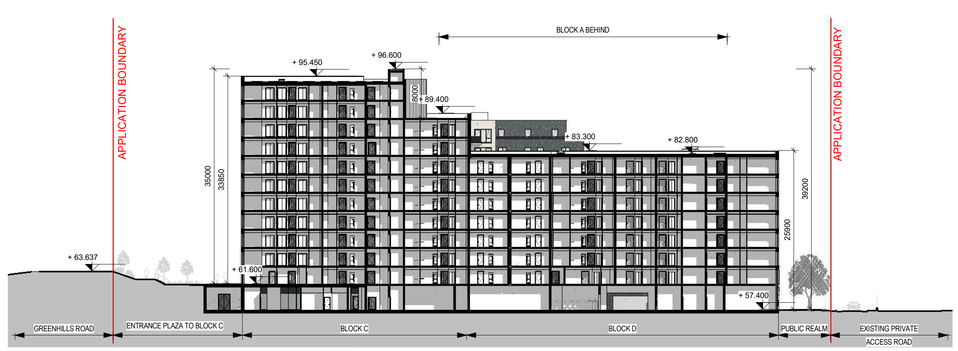

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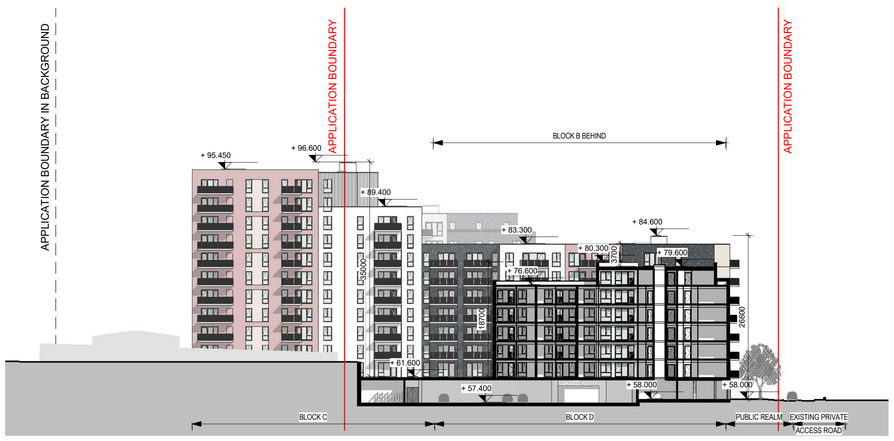

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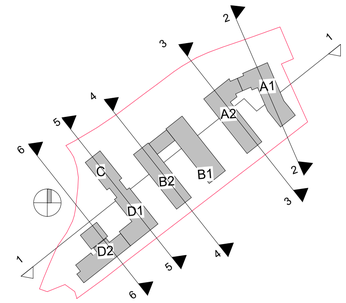


Rev	Description	Date	Dr by	App by
P01	Issue for planning	22/11/2023		

Project Stage

PLANNING

Client:

Steeplefield Limited,

Project:

Greenhills Road, Walkinstown,
Dublin 12

Drawing Title:

PROPOSED CONTEXTUAL SECTIONS

Drawn	Checked	Paper Size	Scale	Date
CS	AM	A1	1 : 500@A1	24/08/2023

Project No.	Drawing No.	Classification	Revision
PE18001	001300		P01

File Name

PE18001-CWO-ZZ-ZZ-DR-A-001300

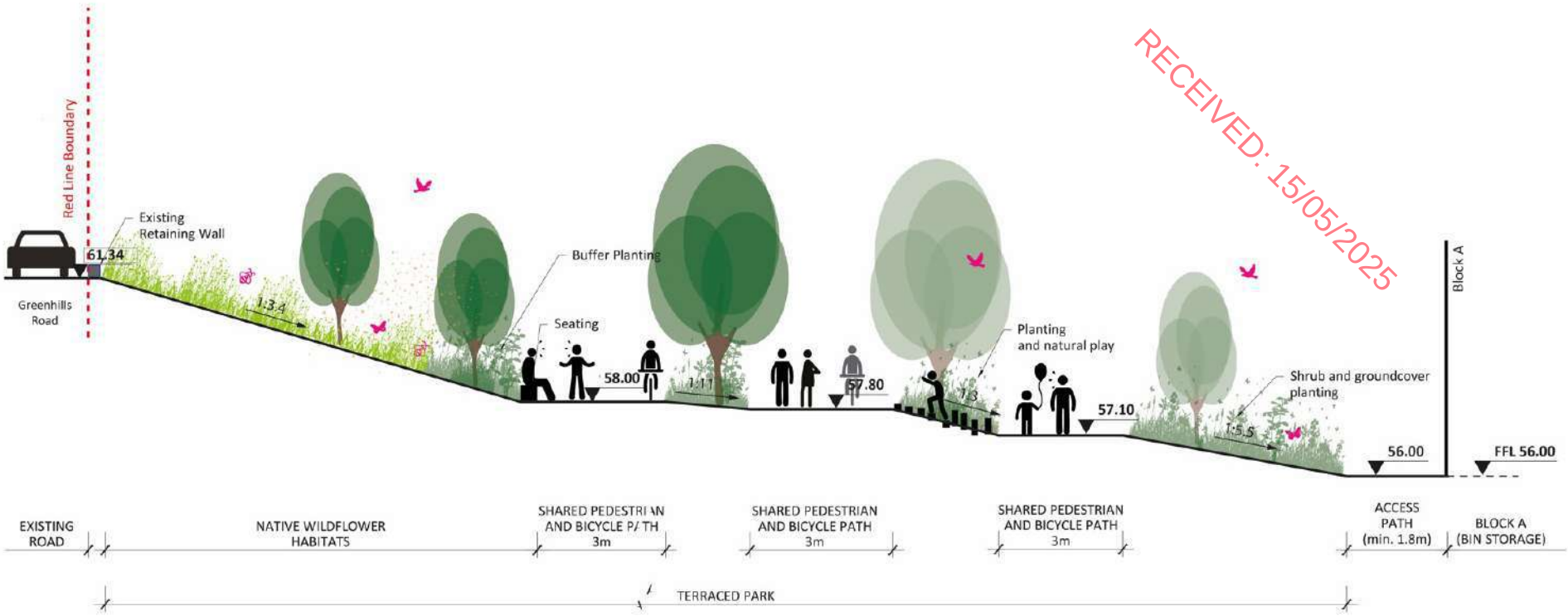
Status:

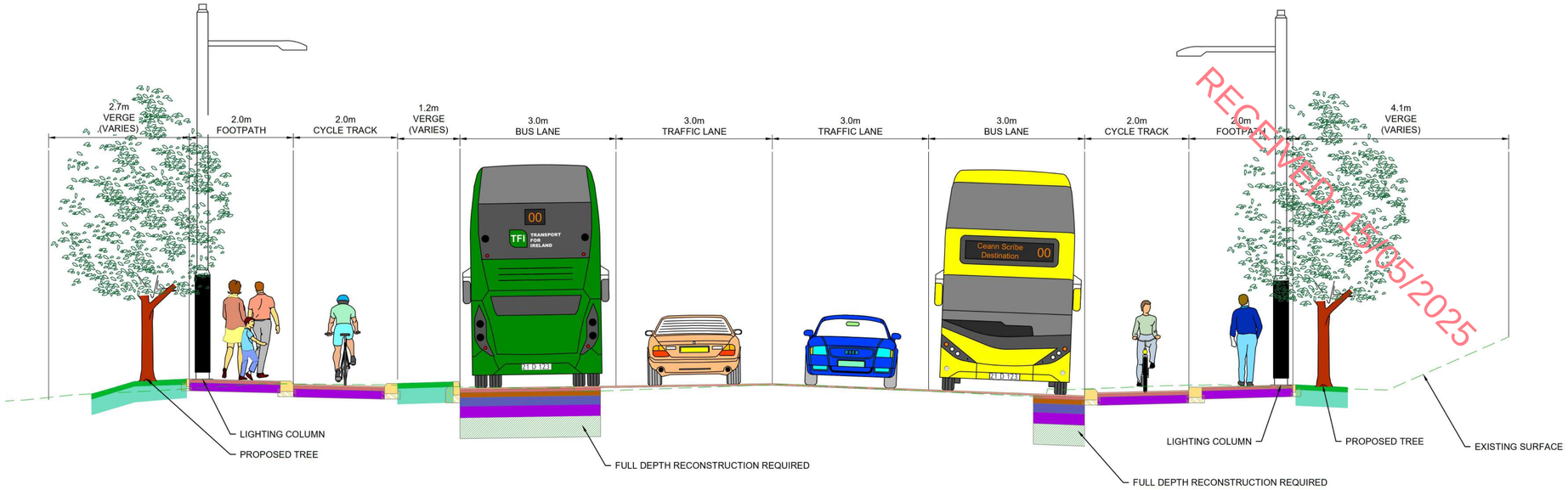
S3 ISSUED FOR PLANNING

C+W O'BRIEN ARCHITECTS

No.1 Sarsfield Quay, Dublin 7, D07 R9FH
t: 01 518 0170 e: admin@cworchitects.ie
Dublin I Cork I Galway I London I UK & Europe +
www.cworchitects.ie

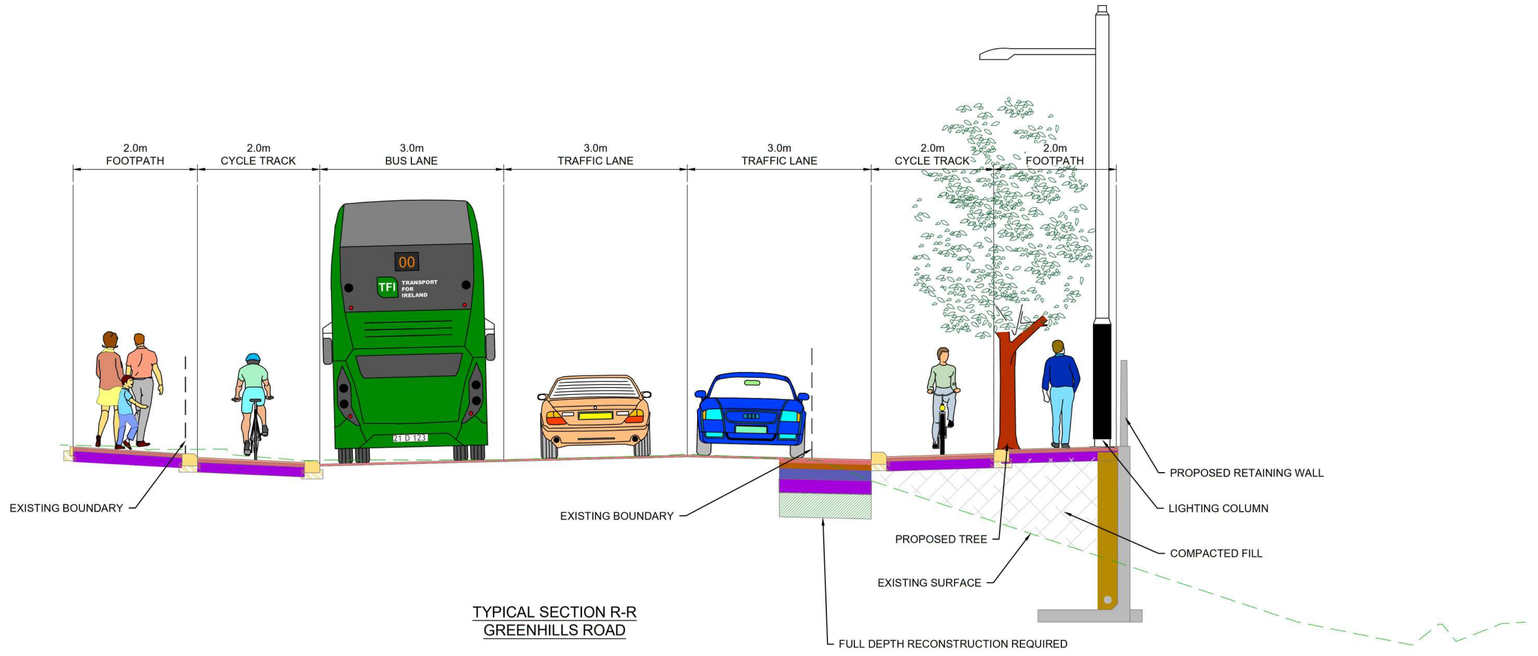
Please consider the environment before printing this sheet





TYPICAL SECTION Q-Q
CALMOUNT ROAD

LOCATED ON GA SHEET 17
DRAWING REF: BCIDA-ACM-GEO_GA-0809_XX_00-DR-CR-0017



TYPICAL SECTION R-R
GREENHILLS ROAD

LOCATED ON GA SHEET 18
DRAWING REF: BCIDA-ACM-GEO_GA-0809_XX_00-DR-CR-0018

NOTES:

1. ADDITIONAL PROPOSED SCHEME INFORMATION AVAILABLE ON THE DRAWING SERIES PROVIDED WITHIN VOLUME III OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR).
2. WHERE PROPERTY LINE ADJUSTMENTS ARE PROPOSED, NEW BOUNDARY WALLS ARE PROPOSED TO MATCH EXISTING UNLESS OTHERWISE DETERMINED IN CONSULTATION WITH THE LANDOWNER.

Project Ireland 2040 Building Ireland's Future

Rev	Date	Drn	Chk'd	App'd	Description
M01	21/03/23	EM	AD	CA	ISSUE FOR PHASE 4: PLANNING

Client: NTA Údarás Náisiúnta Iompair National Transport Authority
Engineering Designer: AECOM / MOTT MACDONALD

Date	Scale		Drawn	Checked	Approved
21/03/23	1:50 @ A1 1:100 @ A3		E.MINCHER	A.DUGGAN	C.ACTON

Project Code	Originator Code	QMS Code
BCIDA	ACM	

Programme Title: **BUSCONNECTS DUBLIN CORE BUS CORRIDORS INFRASTRUCTURE WORKS**

Drawing Title: TALLAGHT/CLONDALKIN TO CITY CENTRE CORE BUS CORRIDOR SCHEME TYPICAL CROSS SECTIONS

Drawing File Name	Sheet Number	Status	Rev
BCIDA-ACM-GEO_CS-0809_XX_00-DR-CR-0009	09 of 28	A	M01

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

APPENDIX Q

Letter to NTA 08th February 2024
- Response to the NTA's Email

NRB Consulting Engineers Ltd
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Apollo Building
Dundrum Road
Dundrum
Dublin 14

☎ +353 1 292 1941
✉ info@nrb.ie
🌐 www.nrb.ie

08 February 2024
22087/BM

National Transport Authority
Dún Scéine
Harcourt Lane
Dublin 2
D02 WT20

By Email Only

Dear All,

RESPONSE TO THE NTA's EMAIL RECEIVED ON THE 15th December 2023

Following NRB's letter to the NTA, dated the 8th of December 2023, entitled *Response to the NTA's email received on the 21st June 2023*, the NTA raised 4no. issues regarding the proposed scheme in their email on the 15th December 2023.

We set out or response to the NTA's concerns below.

Item 1 – Retaining Wall.
As stated previously, if the LRD is constructed before the Tallaght/Clondalkin CBC, the retaining wall requirement could be reduced adjacent to the LRD. If the CBC is constructed first the retaining wall would need to be adjusted at this location by the LRD to facilitate LRD Priority Junction Access.

DT Response - Yes, if the CBC is constructed first, the applicant will adjust the retaining wall to facilitate the LRD Priority Junction Access.

Item 2 – Construction Viability of Retaining Wall
The NRB Tech Note, dated 08/12/2023, states the revised LRD design will be future-proofed to accommodate extended outbound bus lane opportunity within LRD development site boundary (Figures 2 & 4 below extract from NRB Tech Note). The LRD pedestrian ramp structure appears very close to Bus Connects retaining wall. NRB should confirm the location & level of this ramp and confirm they have assessed the construction viability of retaining wall. (Section 3-3 below is an approximation of embankment at location of LRD ramp nearest Bus Connects retaining wall shown in red.)

DT Response – The proposed LRD pedestrian ramp structure rises up to meet the level of the Bus Connects scheme at the proposed site access junction. Therefore, where the LRD pedestrian ramp structure comes close to the Bus Connects scheme, there is not a significant level difference.

The cross sections below, in Figures 1 and 2, are taken 18m from the site access junction. The level difference between the LRD pedestrian ramp and the Bus Connects Scheme is approximately 1.0m, with a 1.0m offset between the two footpaths.

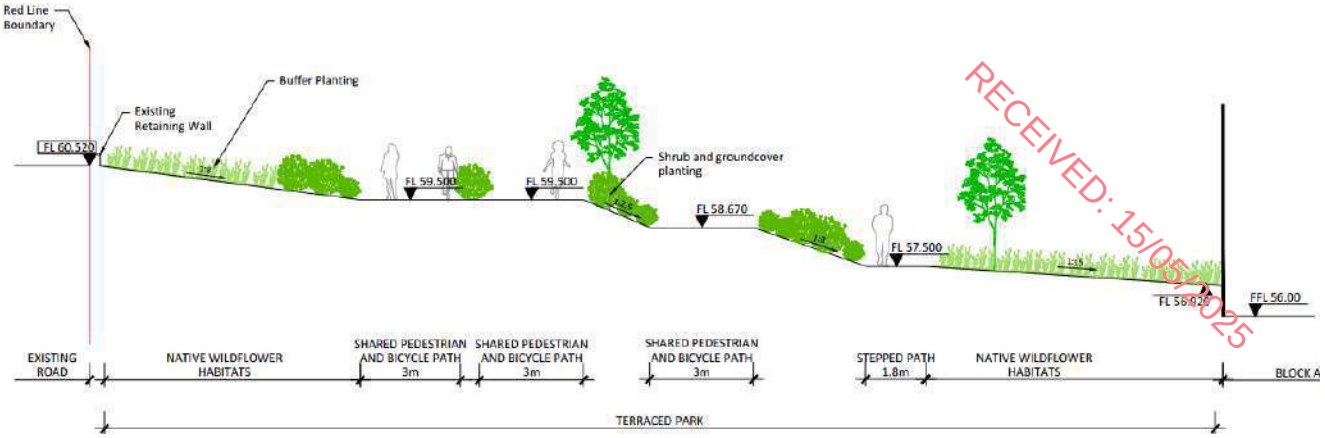


Figure 1: Cross Section 18m from the Site Access (Without BusConnects)

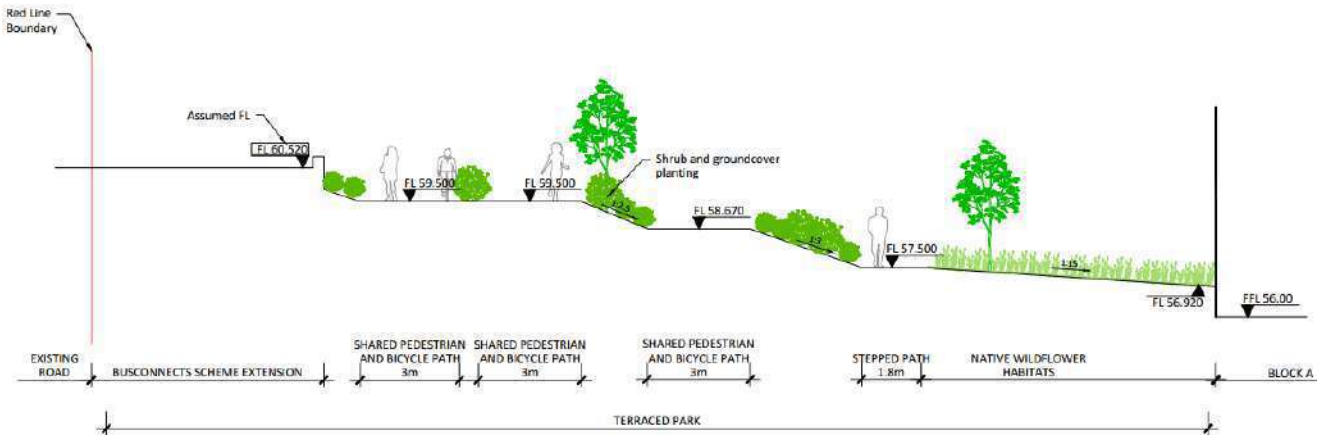


Figure 2: Cross Section 18m from the Site Access (With BusConnects)

The cross sections below, in Figures 3 and 4. Are taken 13m from the site access junction. The level difference between the LRD pedestrian ramp and the BC Scheme has reduced to approximately 0.5m, with a 1.0m offset between the two footpaths.

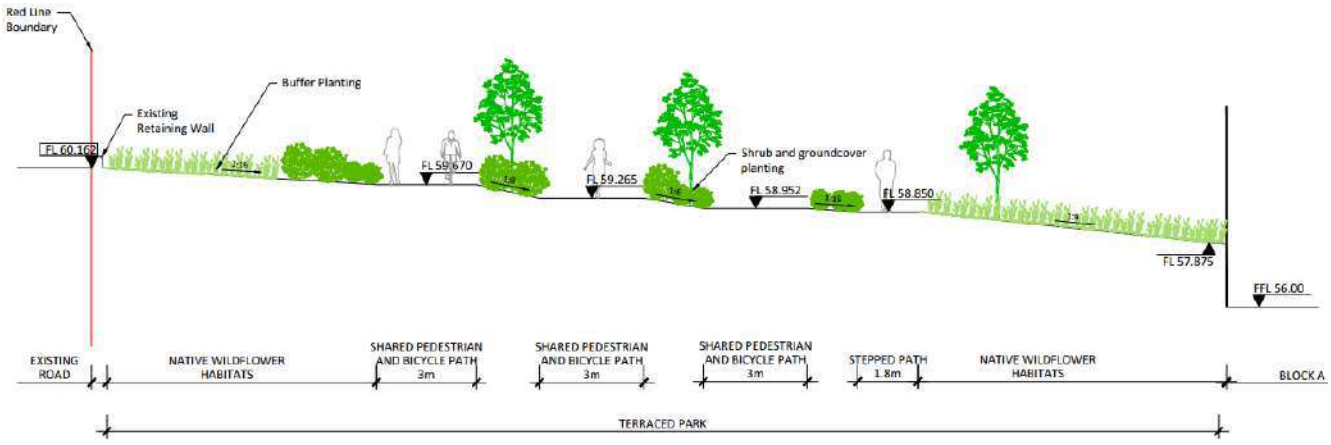


Figure 3: Cross Section 13m from the Site Access (Without BusConnects)

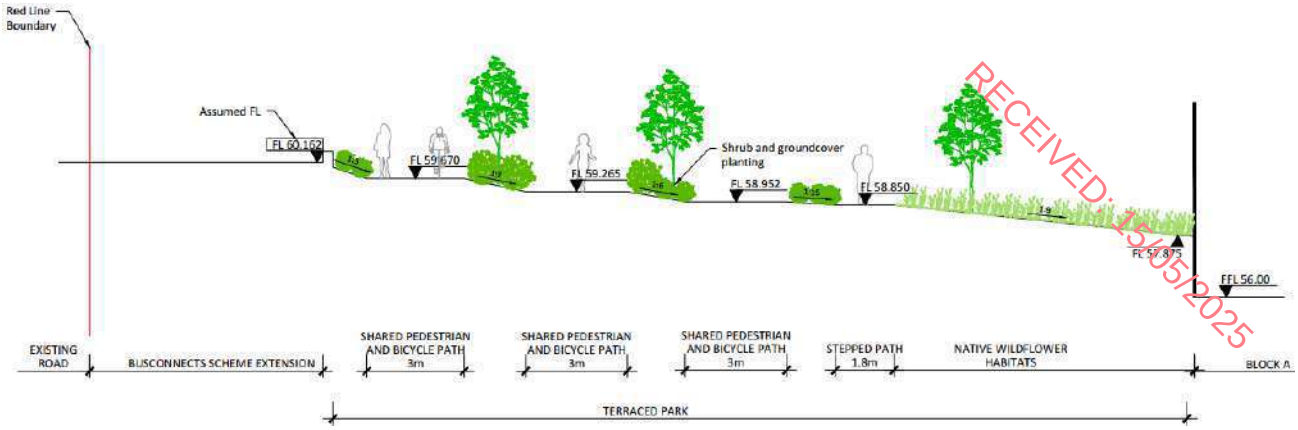


Figure 4: Cross Section 13m from the Site Access (With BusConnects)

With the small level difference between the two schemes and the 1.0m distance between them, there will be no issues regarding the construction / viability of the retaining wall.

The following has been provided by the Structural Engineer on the Design Team, having reviewed the sections as set out in Figures 1 to 4 – "*I do not see any concerns regarding the construction viability of the retaining wall. We are far away from the watermain and the associated wayleave, meaning that the excavation works for this retaining wall installation will not impede onto the wayleave & any maintenance excavation works required for the existing watermain will not undermine the retaining wall*".

Item 3 – Removal of Uncontrolled Pedestrian Crossings

The NRB Tech Note does not address our earlier comment that we assume it is proposed to remove the uncontrolled pedestrian crossings on Greenhills Road once Bus Connects scheme is in place with controlled pedestrian crossing west of the LRD development. NRB should confirm this.

DT Response – NRB can confirm that the uncontrolled pedestrian crossings on Greenhills Road would be removed as part the Bus Connects Scheme and to be replaced by the Bus Connects proposals.

Item 4 – Traffic and Transport Assessment

Traffic modelling figures used for PiCADY Junction Access to LRD development would need to be confirmed; there is a concern that any queueing for right-turning traffic on Greenhills Road would lead to general inbound traffic diverting onto BusConnects CBC bus lane to avoid R-T queue. The NRB Tech Note states that detailed modelling will be submitted to SDCC as part of the Traffic and Transport Assessment. NRB should provide the Traffic and Transport assessment.

DT Response – Full details of the Traffic Analysis are provided as part of the Traffic and Transport Assessment (TTA) report which forms part of the application. Detailed modelling out, including PICADY and LinSig analysis, have now been issued to the NTA.

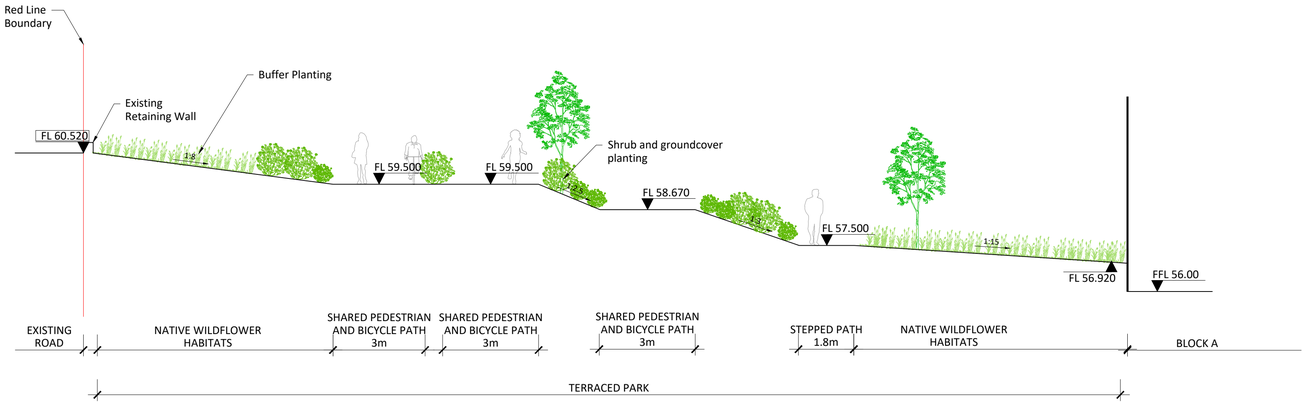
We believe that the revised design addresses all of the concerns raised by the NTA.

Yours sincerely,

Brian McMahon

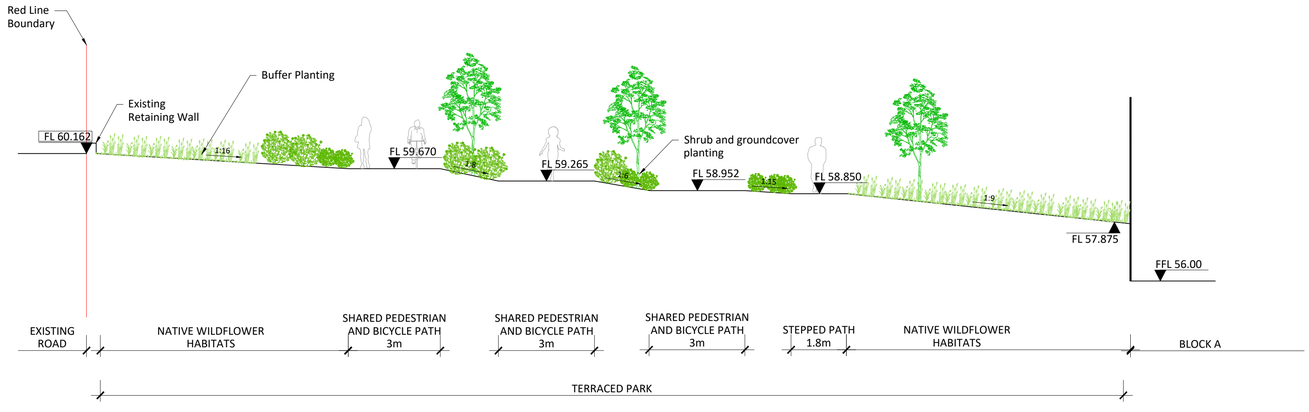
Brian McMahon
Chartered Engineer
Director

Enclosures: Parkhood Drawing - Landscape Site Sections Current Proposed Scheme
Parkhood Drawing - Landscape Site Sections Bus Connects Future Condition
NRB FINAL TA & Appendices Chadwicks 08 December 2023 (link provided)



H Terraced Park - Shared Pedestrian and Bicycle Path (Current Proposed Scheme)
Section 1:100

Key Plan
Plan



I Terraced Park - Shared Pedestrian and Bicycle Path (Current Proposed Scheme)
Section 1:100

Description **Revision Notes**	XX / XX By / Chk	DD/MM/YY Date	00 Rev

Status: INFORMATION

Park Hood
Chartered Landscape Architects
Hawarden House, 163 Upper Newtownards Road, Belfast, BT4 3HZ
T: +44 (0) 28 9029 8020 **E:** info@parkhood.com **parkhood.com**

Client: Steeplefield Limited

Project: Former Chadwicks Site, Greenhills
Dublin

Title: Landscape Site Sections
Current Proposed Scheme

Job No: 7103 **Scale@**A1 1:100 **Date:** January 2024

Drawing Number

Project	Originator	Volume	Level	Type	Role	Number	Revision
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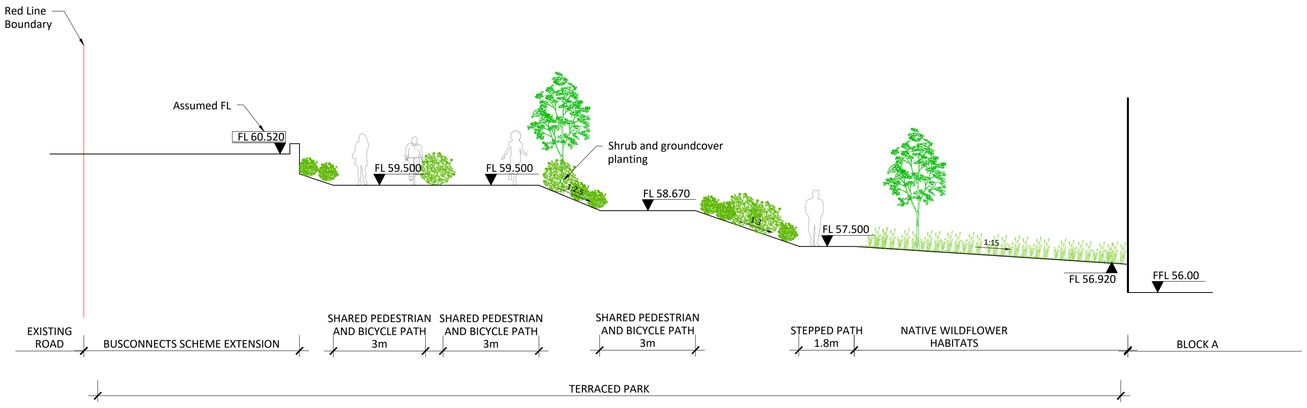
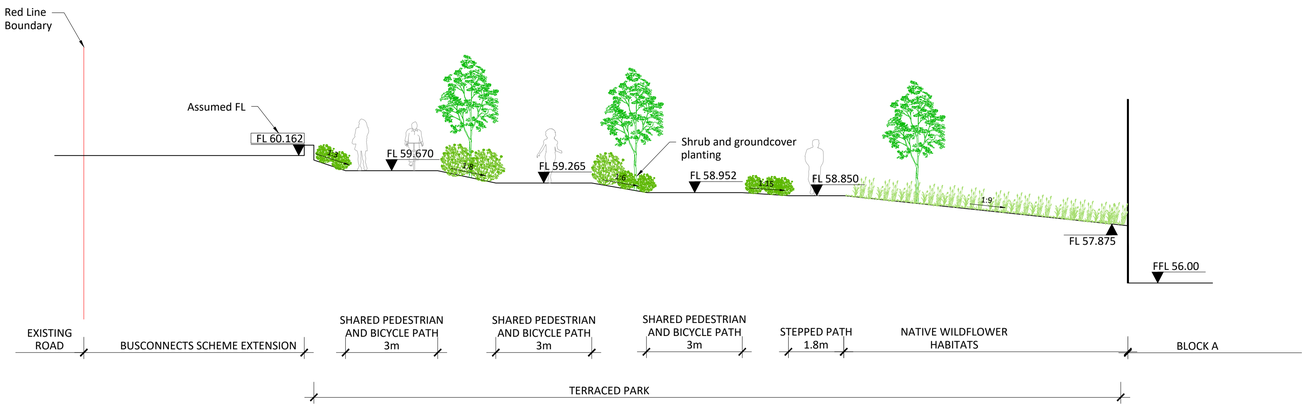
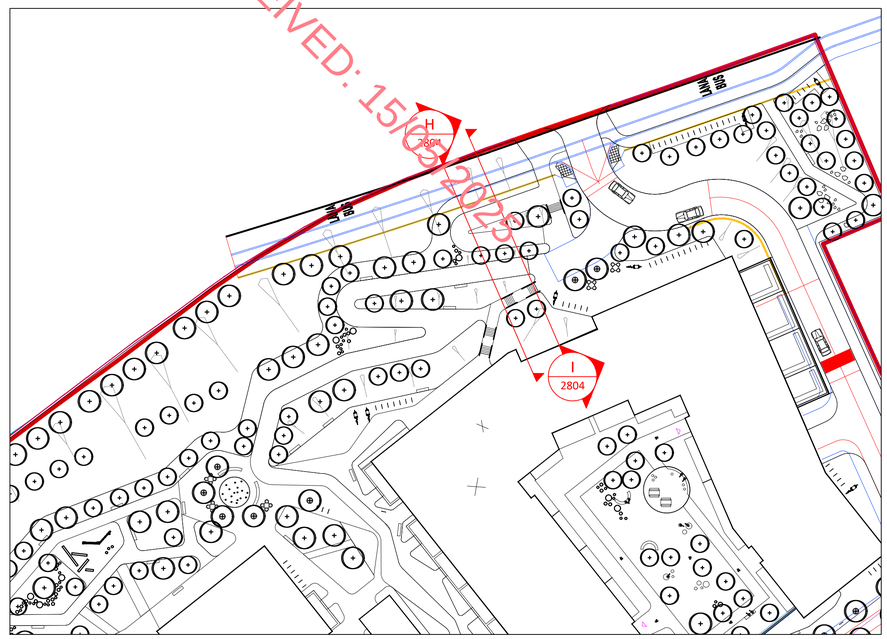


H Terraced Park - Shared Pedestrian and Bicycle Path (BusConnects Future Condition)
Section 1:100



I Terraced Park - Shared Pedestrian and Bicycle Path (BusConnects Future Condition)
Section 1:100



Key Plan
Plan

Description / Revision Notes	XX / XX By / Chk	DD/MM/YY Date	00 Rev

Status: INFORMATION

Park Hood
Chartered Landscape Architects
Hawarden House, 163 Upper Newtownards Road, Belfast, BT4 3HZ
T: +44 (0) 28 9029 8020 **E:** info@parkhood.com **parkhood.com**

Client: Steeplefield Limited

Project: Former Chadwicks Site, Greenhills Dublin

Title: Landscape Site Sections Bus Connects Future Condition

Job No: 7103 | **Scale@**A1 1:100 | **Date:** January 2024

Drawing Number

Project	Originator	Volume	Level	Type	Role	Number	Revision
7103	PHL	SW	XX	DR	L	2804	00

APPENDIX R

Email from the NTA 12th February 2025 – NTA Sign Off

Brian McMahon

From: Julie Galbraith <Julie.Galbraith@nationaltransport.ie>
Sent: Wednesday 12 February 2025 16:52
To: Brian McMahon
Cc: Alex Fahey; Graham Murphy; Eoin Reynolds; Paul Burke; Colm Kelly; Anthony Sheehy
Subject: RE: Corridor 9 Greenhills to City Centre - Chadwicks Site, Greenhills Road

Hi All,

The NTA Bus Connects team have reviewed the revised drawings and are satisfied that the drawings now reflect the current approved Core Bus Corridor alignment for the Tallaght/ Clondalkin to City Centre Scheme.
They are also satisfied that the technical note reflects the requirement for the developer to liaise with the BusConnects team to coordinate the setting out details of the junction into the development to ensure any rework is limited and all tie-in works can be undertaken with the approval permanent/ temporary land take boundaries.

Notwithstanding the above, in undertaking our role as a statutory consultee, the NTA reserves the right to submit further observations on this or other aspects of the proposed development at any subsequent stage of the planning process.

Many thanks for your collaboration at the pre-planning stage.

Kind regards,
Julie Galbraith

Julie Galbraith
Land Use & Transport Planner, Strategic Planning
National Transport Authority | Údarás Náisiúnta Iompair
Teach Mhargadh an Fhéir, Margadh na Feirme, Baile Átha Cliath 7, D07 CF98
Haymarket House, Smithfield, Dublin 7, D07 CF98
+353 (01)879 8300, (Ext. 8354)
julie.galbraith@nationaltransport.ie
www.nationaltransport.ie

From: Brian McMahon <brian.mcmahon@nrb.ie>
Sent: Friday 7 February 2025 10:30
To: Julie Galbraith <Julie.Galbraith@nationaltransport.ie>; Colm Kelly <Colm.Kelly@nationaltransport.ie>; Anthony Sheehy <Anthony.Sheehy@nationaltransport.ie>
Cc: Alex Fahey <afahey@SDUBLINCOCO.ie>; Graham Murphy <gmurphy@SDUBLINCOCO.ie>; Eoin Reynolds <eoin.reynolds@nrb.ie>; Paul Burke <paul.burke@nrb.ie>
Subject: RE: Corridor 9 Greenhills to City Centre - Chadwicks Site, Greenhills Road

Hi All,

Thank you for meeting us yesterday, it was very much appreciated.

I've attached our updated TA drawings. TA drawings 007 & 008 have now been updated to show the approved BusConnects scheme (i.e. without a bus lane past our site). However, we also show a dashed yellow line which indicates a set-back line for a potential future bus lane (subject to a future planning application).

TA-001 – Proposed Site Layout
TA-002 – Proposed Greenhills Road Access Sightlines
TA-007 – Proposed Site Layout **with Approved BusConnects Scheme**.
TA-008 – Proposed Greenhills Road Access Sightlines **with Approved BusConnects Scheme**.

Could the NTA confirm that all of their concerns regarding the proposed layout have been addressed, and provide a note to that effect?

Regards,

Brian McMahon

NRB Consulting Engineers Ltd
5th Floor
40 Mespil Road
Dublin 4
D04 C2N4

Tel: +353 1 292 1941
Mobile: 087 760 4876
E-mail: brian.mcmahon@nrb.ie
Web: www.nrb.ie

From: Brian McMahon
Sent: Wednesday 5 February 2025 12:32

APPENDIX 12.1

RESOURCE & WASTE MANAGEMENT PLAN

85 Merrion Square, Dublin 2, D02 FX60
+353 (0)1 539 0710 info@hpdc.ie www.hpdc.ie

HUGHES PLANNING
& DEVELOPMENT CONSULTANTS

awnconsulting
A Trinity Consultants Company

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

RESOURCE & WASTE MANAGEMENT PLAN FOR A LARGESCALE RESIDENTIAL DEVELOPMENT AT FORMER CHADWICK'S SITE, GREENHILLS ROAD, WALKINSTOWN, DUBLIN 12

Report Prepared For

Steeplefield Limited

Report Prepared By

David Doran, Senior Environmental Consultant

Our Reference

DD/R247501.0096WMR02

Date of Issue

07 May 2025

AWN Consulting Limited
Registered in Ireland No. 319812

Document History

Document Reference		Original Issue Date	
DD/R247501.0096WMR02		07 May 2025	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		
Name	David Doran	Chonaill Bradley
Title	Senior Environmental Consultant	Associate
Date	07 May 2025	07 May 2025

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Resource and Waste Management Plan (RWMP) on behalf of Steeplefield Limited. The proposed development involves the construction of 588 no. residential apartment units, 1 no. childcare facility and 6 no. no. commercial/retail units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys at the former Chadwick's site, Greenhills Road, Walkinstown, Dublin 12.

This plan provides information necessary to ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Act 1996* as amended and associated Regulations [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3],the National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024) [4]. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also provides appropriate measures in relation to the collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

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

2.0 C&D RESOURCE & WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998*, Changing Our Ways* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2018).

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

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), replaces the previous national waste management plan, *"A Resource Opportunity"* (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements

of a number of public bodies already acknowledge the circular economy as a national policy priority.

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

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

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

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

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

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

- New residential development of less than 10 dwellings.

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

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

This development requires a RWMP as a Tier 2 development as it exceeds the following thresholds:

- New residential development of less than 10 dwellings.

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

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

2.2 Regional Level

The proposed development is located in the Local Authority area of South Dublin County Council (SDCC).

The Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, which previously governed waste management policy in the DCC area, has been superseded as of March 2024 by the NWMPCE 2024 – 2030, the new national waste management plan for Ireland.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

National Targets

1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.

3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140 - €160 per tonne of waste which includes an €85 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015 (as amended)* [13]*. The Circular Economy (Waste Recovery Levy) Regulations 2024* [14] *will also a e levy of €10 per tonne to waste accepted for recovery. This will included backfilling at authorised recovery sites and at municipal waste landfills.*

The *South Dublin County Council Development Plan 2022– 2028* [15] sets out a number of objectives and actions for the South Dublin area in line with the objectives of the waste management plan.

Policy and Objectives

Policy IE7: Waste Management

Implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.

- **IE7 Objective 1**
  To encourage a just transition from a waste management economy to a green circular economy to enhance employment and increase the value, recovery and recirculation of resources through compliance with the provisions of the Waste Action Plan for a Circular Economy 2020 – 2025 and to promote the use of, but not limited to, reverse vending machines and deposit return schemes or similar to ensure a wider and varying ways of recycling.
- **IE7 Objective 2**
  To support the implementation of the Eastern Midlands Region Waste Management Plan 2015-2021 or as amended by adhering to overarching performance targets, policies and policy actions.
- **IE7 Objective 4**
  To provide for and maintain the network of bring infrastructure (e.g. civic amenity facilities, bring banks) in the County to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes.
- **IE7 Objective 7**
  To require the appropriate provision for the sustainable management of waste within all developments, ensuring it is suitably designed into the development, including the provision of facilities for the storage, separation and collection of such waste.
- **IE7 Objective 8**
  To adhere to the recommendations of the National Hazardous Waste Management Plan 2014-2020 and any subsequent plan, and to co-operate with other agencies including the EPA in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects.

2.3 Legislative Requirements

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

- Waste Management Act 1996 as amended;
- Environmental Protection Act 1992 as amended;
- Litter Pollution Act 1997 as amended;

- Planning and Development Act 2000 as amended [16]; and
- Circular Economy and Miscellaneous Provisions Act 2022.

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

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

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

3.0 Design Approach

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

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

As noted in the EPA guidelines, the approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;

- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

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

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

3.2 Designing for Green Procurement

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

3.3 Designing for Off-Site Construction

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

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

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite as outlined in Section 3.1, structures will be designed with the intent of designing out waste. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for

certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

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

4.0 DESCRIPTION OF THE PROJECT

4.1 Location, Size and Scale of the Development

The proposed development consists:

1. The demolition of the former Chadwicks Builders Merchant development comprising 1 no. two storey office building and 9 no. storage/warehouse buildings ranging in height from 3m – 9.9m as follows: Building A (8,764 sq.m.), Building B (1,293 sq.m.), Building C (two-storey office building) (527 sq.m.), Building D (47 sq.m.), Building E (29 sq.m.), Building F (207 sq.m.), Building G (101 sq.m.), Building H (80 sq.m.), Building I (28 sq.m.), and Building J (44 sq.m.), in total comprising 11,120 sq.m.;
2. the construction of a mixed-use residential and commercial development comprising 588 no. residential apartment units (291 no. one-beds, 238no. two-beds and 59 no. three-beds), 1 no. 570.91sqm (443sqm indoor space) childcare facility and 6no. no. commercial/retail units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys as follows:
   a) Block A comprises 170 no. apartments (103 no. 1 bed-units, 59 no. 2 bed-units and 8 no. 3- bed units) measuring 8 storeys in height.
   b) Block B comprises 197 no. apartments (89 no. 1 bed-units, 92 no. 2 bed-units and 16 no. 3 bed-units) measuring 10 storeys in height.
   c) Block C comprises 81 no. apartments (44 no. 1-bed units, 16 no. 2-bed units and 21 no. 3-bed units) measuring 12 storeys in height.
   d) Block D comprises 140 no. apartments (55 no. 1 bed-units, 71 no. 2 bed-units and 14 no. 3 bed-units) measuring 8 storeys in height.
   All apartments will be provided with private balconies/terraces;
3. provision of indoor communal residential amenity (614.14 sq.m.) at ground and first floors of Block A, B , C, ;
4. the construction of 1 no. childcare facility with dedicated outdoor play area located at ground floor of Block B;
5. the construction of 6no. commercial units at ground floor level of Blocks A, B and D, and 1 no. commercial unit at first floor level of Block A as follows: Block A has 1 no. unit at ground floor comprising 455.8 sq.m. and 1 no. unit at first floor level comprising 160.79 sq.m., Block B has 1 no. unit at ground floor comprising 190.96 . and Block D has 4 no. units at ground floor comprising 361.6, 232.3, 238 and 174.9 sq.m.;
6. the construction of 4 no. vehicular entrances; a primary entrance via vehicular ramp from the north (access from Greenhills Road) and 3 no. secondary entrances from the south for access, emergency access and services (access from the existing road to the south of the site) with additional pedestrian accesses proposed along Greenhills Road;

7. provision of 270 no. car parking spaces comprising 240 no. standard spaces (including 6 no. car club spaces) and 13 no. mobility spaces located at surface level and within undercroft car parks within Blocks A, B , C and D, 17 no. commercial/ unloading/ drop-off parking spaces at ground level.
8. provision of 1,269 no. bicycle parking spaces comprising 952 no. residents' bicycle spaces, 10 no. cargo/accessible bicycle spaces in 14 no. bicycle storerooms in surface and undercroft parking areas and 307 no. visitors' bicycle spaces located externally at ground floor level throughout the development;
9. provision of outdoor communal amenity space (3,130.3 sq.m) comprising landscaped courtyards that include play areas, seating areas, grass areas, planting and scented gardens located on podiums at first floor level; provision of communal amenity roof gardens in Block A & B with seating area and planting (746.1 sq.m.) and inclusion of centrally located public open space (6,6650 sq.m.) adjacent to Blocks A, B, C and D comprising grassed areas, planting, seating areas, play areas, water feature, flexible use space and incidental open space/public realm;
10. provision of toucan crossing and all associated road markings and signage from the subject site to a new footpath on northern side of Greenhills Road;
11. development also includes landscaping and infrastructural works, foul and surface water drainage, bin storage, ESB substations, plant rooms, pv panels, boundary treatments, internal roads, cycle paths and footpaths and all associated site works to facilitate the development.

This application is accompanied by an Environmental Impact Assessment Report (EIAR).

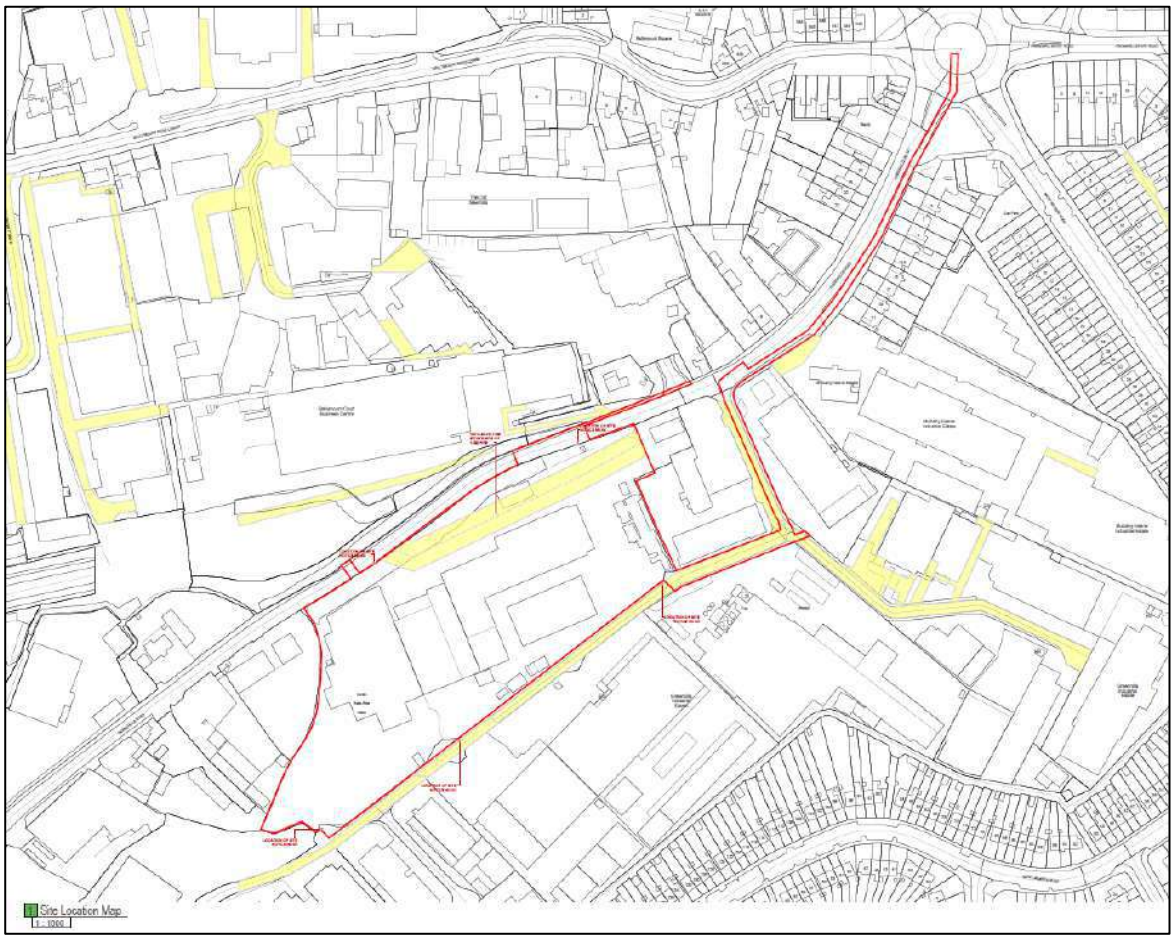


Figure 4.1 *Site Location Map (Drawing Ref PE18001-CWO-ZZ-ZZ-DR-A-000001).*

4.2 Details of the Non-Hazardous Wastes to be Produced

There will be topsoil, made ground and clay excavated to facilitate construction of new foundations, and installation of underground services. The project Engineers (J. B. Barry and Partners Limited) have estimated c. 24,008 m^3 of material will need to be excavated to facilitate the proposed development. It is expected that c. 1,200m^3, of the excavated material will be re-used on site with the remaining c. 22,808 m^3 of excavated material will be removed off site for appropriate offsite reuse, recovery, recycling and / or disposal.

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

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

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Ground investigation works were undertaken by Ground Investigations Ireland Ltd. in January 2021. The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 14 No. Window Sample Boreholes to recover soil samples
- Carry out 10 No. Cable Percussion boreholes to a maximum depth of 4.50m BGL
- Installation of 3 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

Further information on the methodologies used for the works completed can be found in the *Ground Investigation Report* by Ground Investigations Ireland (2021) submitted with the planning application.

For the Laboratory testing, samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design. Environmental & Chemical testing on soil samples, as required by the specification, including the Rilta Suite, pH and sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta Suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria (WAC). A number of groundwater samples were also tested by Element, using an indicator parameter suite. Geotechnical testing consisting of moisture content, Atterberg limits and, Particle Size Distribution (PSD), tests were carried out in NMTL's Geotechnical Laboratory in Carlow.

All 22 (19 no. soil and 3 no. ground water) of the samples sent for laboratory testing returned inert readings in the WAC analysis as listed in the EC Council Decision 2003/33/EC.

A Waste Characterisation Assessment will be required prior to any excavated material leaving the site.

The WCA will classify the soils as either hazardous or non-hazardous, which in turn enable contractors to obtain disposal costs for various landfills.

If any potentially contaminated material is encountered, it will be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [17] using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [18], which establishes the criteria for the acceptance of waste at landfills.

Prior to the removal of excess excavated material from site soil samples will be sent for environmental testing.

No asbestos was identified in the soil samples collected. In the event that Asbestos containing materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010 and the Best Practice Guidance for Handling Asbestos (2023)* [19]. Any asbestos will be taken to a suitably licensed or permitted facility.

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

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel/oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil waste generated at the site.

4.3.3 Invasive Plant Species

Enviroguide Consulting Ltd. visited the site on the 21st April 2021 to carry out an invasive species survey; this included walkover of the entire site. There was no invasive alien plant species (as per the Third Schedule of the S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011) noted at the site.

Should a Third Schedule invasive flora species be found at a later date; an Invasive Species Management Plan will be prepared and will likely include a multi-pronged approach to the eradication and treatment.

4.3.4 Asbestos

If asbestos is located onsite then the removal of asbestos or ACMs will be carried out by a suitably qualified contractor. The ACM's will only be removed from site by a suitably permitted waste contractor in accordance with the *Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos/ACMs will be taken to a suitably licensed or permitted facility.

4.3.5 Other known Hazardous Substances

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

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

5.0 ROLES AND RESPONSIBILITIES

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

5.1 Role of the Client

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

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

5.2 Role of the Client Advisory Team

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

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

5.3 Future Role of the Contractor

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

- Preparing, implementing and reviewing the RWMP throughout the construction phases (including the management of all suppliers and sub-contractors) as per the requirements of the EPA guidelines;
- Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- Applying for the appropriate waste permit to crush concrete onsite;
- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a ‘waste’ must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) will be maintained for the duration of the project; and
- Preparing a RWMP Implementation Review Report at project handover.

6.0 KEY MATERIALS AND QUANTITIES

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information will be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will

inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that will be used to set targets include (as per guidelines):

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

6.2 Main Construction Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (2018) for each waste stream is also shown.

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

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

* *individual waste type may contain hazardous substances*

6.3 Demolition Waste Generation

The existing site comprises of 1 no. two storey office building and 9 no. storage/warehouse buildings ranging in height from 3m – 9.9m. All existing structure will be demolished to facilitate the construction of the Proposed Development.

The demolition areas are identified in the planning drawings provided with this application. The anticipated demolition waste and rates of reuse, recycling / recovery and disposal are shown in Table 6.2, below.

Table 6.2 *Estimated off-site reuse, recycle and disposal rates for demolition waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	8.8	0	0.0	85	7.5	15	1.3
Concrete, Bricks, Tiles, Ceramics	965.3	30	289.6	65	627.4	5	48.3
Plasterboard	52.7	30	15.8	60	31.6	10	5.3
Asphalts	105.3	0	0.0	25	26.3	75	79.0
Metals	394.9	5	19.7	80	315.9	15	59.2
Slate	17.6	0	0.0	85	14.9	15	2.6
Timber	210.6	10	21.1	60	126.4	30	63.2
Total	**1755.0**		**346.2**		**1150.0**		**258.9**

6.4 Construction Waste Generation

The below Table 6.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* [20] *and the joint EPA & GMIT study* [21], along with other research reports.

Table 6.1 *Waste materials generated on a typical Irish construction site.*

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

The Table 6.2 below shows the estimated construction waste generation for the development based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated waste amounts for the main waste types (with the exception of soils and stones) are based on an average large-scale development waste generation rate per m^2, using the waste breakdown rates shown in Table 6.1. These have been calculated from the schedule of development areas provided by the architect.

Table 6.2 *Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Total Waste	Reuse		Recycle/Recovery		Disposal	
	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	1215.3	10	121.5	80	972.2	10	121.5
Timber	1031.2	40	412.5	55	567.1	5	51.6
Plasterboard	368.3	30	110.5	60	221.0	10	36.8
Metals	294.6	5	14.7	90	265.2	5	14.7
Concrete	221.0	30	66.3	65	143.6	5	11.0

Other	552.4	20	110.5	60	331.4	20	110.5
Total	**3682.7**		**836.0**		**2500.6**		**346.2**

In addition to the information in Table 6.3, there will be topsoil, made ground and clay excavated to facilitate construction of new foundations, and installation of underground services. The project Engineers (J. B. Barry and Partners Limited) have estimated c. 24,008 m^3 of material will need to be excavated to facilitate the proposed development. It is expected that c. 1,200m^3, of the excavated material will be re-used on site with the remaining c. 22,808m^3 will be taken for appropriate offsite reuse, recovery, recycling and/or disposal.

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

6.5 Proposed Resource and Waste Management Options

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

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

National End-of-Waste Decision EoW-N001/2023 (Regulation 28) published by the EPA in September 2023, establishes criteria determining when recycled aggregate resulting from a recovery operation ceases to be waste. Material from this proposed development will be investigated to see if it can cease to be a waste under the requirements of the National End of Waste Criteria for Aggregates.

During construction some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (Ref. Article 30 (1) (b) of the Waste Collection Permit Regulations 2007 as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste offsite in their work vehicles (which are not design for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

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

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

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

Topsoil, Made Ground and Clay

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

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

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

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

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the Waste Framework Directive (Directive 2008/98/EC), the *Waste Management Act 1996* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

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

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be

removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from SDCC.

Silt & Sludge

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

Concrete Blocks, Bricks, Tiles & Ceramics

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

Hard Plastic

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

Timber

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

Metal

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

Plasterboard

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

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical and Electronic Equipment (WEEE)

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

Other Recyclables

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

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team (see Section 8.0) to determine if recyclable materials

have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

In the event that asbestos or ACM found onsite will be removed by a suitably competent contractor and disposed of as asbestos waste before the works begin. All asbestos removal work or encapsulation work must be carried out in accordance with *the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.*

Other Hazardous Wastes

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

Onsite Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from SDCC and the destination of the accepting waste facility or if an application under regulation 28 will be made using National End-of-Waste Decision EoW-N001/2023, will be supplied to the SDCC waste unit.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of construction and removal of any waste offsite, details of the proposed destination of each waste stream will be provided to SDCC by the project team.

6.6 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM (see Section 8.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Framework Directive (Directive 2008/98/EC), the *Waste Management Act 1996* as amended, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RM (see Section 8.0) will maintain a copy of all waste collection permits on-site.

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

final destination of the material will be kept as part of the on-site waste management records.

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

7.0 ESTIMATED COST OF WASTE MANAGEMENT

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

7.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle/recovery/disposal costs associated with the requirement for a waste contractor to take the material off-site.

Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as access roads or capping material for landfill sites etc. This material is often taken free of charge or a reduced fee for such purposes, reducing final waste disposal costs.

7.2 Recycling

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

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

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

7.3 Disposal

Landfill charges are currently at around €140 - €160 per tonne which includes a €85 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material, wherever possible.

8.0 TRAINING PROVISIONS

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

8.1 Resource Manager Training and Responsibilities

The nominated RM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site. The RM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the RM to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

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

8.2 Site Crew Training

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

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

9.0 TRACKING AND TRACING / RECORD KEEPING

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

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

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

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

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

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

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

10.0 OUTLINE WASTE AUDIT PROCEDURE

10.1 Responsibility for Waste Audit

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

10.2 Review of Records and Identification of Corrective Actions

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

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

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

11.0 CONSULTATION WITH RELEVANT BODIES

11.1 Local Authority

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

SDCC will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling

opportunities are identified and utilised and that compliant waste management practices are carried out.

11.2 Recycling/Salvage Companies

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

11.3 Pest Management

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

12.0 CONCLUSION

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

13.0 REFERENCES

1. Waste Management Act 1996 as amended,
2. Environmental Protection Agency Act 1992 as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Regional Waste Management Planning Offices, *The National Waste Management Plan for a Circular Economy 2024 – 2030 (2024).*
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8. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less*' (2021)
9. Circular Economy and Miscellaneous Provisions Act 2022.
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13. Waste Management (Landfill Levy) Regulations 2015 (as amended)
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17. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018)
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20. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).
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APPENDIX 12.2

OPERATIONAL WASTE MANAGEMENT PLAN

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OPERATIONAL WASTE MANAGEMENT PLAN FOR A LARGESCALE RESIDENTIAL DEVELOPMENT AT FORMER CHADWICK'S SITE, GREENHILLS ROAD, WALKINSTOWN, DUBLIN 12

Report Prepared For

Steeplefield Limited

Report Prepared By

David Doran, Senior Environmental Consultant

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Title	Senior Environmental Consultant	Associate
Date	07 May 2025	07 May 2025

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.

CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Operational Waste Management Plan (OWMP) on behalf of Steeplefield Limited. The proposed development involves the construction of 588 no. residential apartment units, 1 no. childcare facility and 6 no. no. commercial/retail units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys at the former Chadwick's site, Greenhills Road, Walkinstown, Dublin 12.

This OWMP has been prepared to ensure that the management of waste during the operational phase of the development is undertaken in accordance with current legal and industry standards including, the *Waste Management Act 1996* as amended and associated Regulations [1], *Environmental Protection Agency Act 1992* as amended [2], *Litter Pollution Act 1997* as amended [3], the 'National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024) [4] and the South Dublin County Council *(SDCC) South Dublin County Council Household & Commercial Waste Bye-Laws (2018) [5].* In particular, this OWMP aims to provide a robust strategy for the storage, handling, collection and transport of the wastes generated at site.

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

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

2.0 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National Level

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

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

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

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and Moving Forward'* [9]. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management

plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

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

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

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

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

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

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

Since 1998, the Environmental Protection Agency (EPA) has produced periodic *'National Waste (Database) Reports'* which as of 2023 have been renamed *Circular Economy and Waste Statistics Highlight Reports* [13] detailing, among other things, estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The 2021 National Circular Economy and Waste Statistics web resource, which is the most recent study published, along with the national waste statistics web resource (November 2023) reported the following key statistics for 2020:

- **Generated** – Ireland produced 3,170,000 t of municipal waste in 2021. This is a 1% decrease since 2020. This means that the average person living in Ireland generated 630 kg of municipal waste in 2021.
- **Managed** – Waste collected and treated by the waste industry. In 2020, a total of 3,137,000 t of municipal waste was managed and treated.

- **Unmanaged** – An estimated 33,000 tonnes of this was unmanaged waste i.e., not disposed of in the correct manner in 2021.
- **Recovered** – The amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In Ireland 42% of Municipal waste was treated by energy recovery through incineration in 2021.
- **Recycled** – Just over 1.3 million tonnes of municipal waste generated in Ireland was recycled in 2021, resulting in a recycling rate of 41 per cent. The recycling rate remains unchanged from 2020 and indicates that we face significant challenges to meet the upcoming EU recycling targets of 55% by 2025 and 65% by 2035.
- **Disposed** – The proportion of municipal waste sent to landfill also remains unchanged at 16% the same as 2020.
- **Reuse** – 54,800 tonnes of second-hand products we estimated by the EPA to have been reused in Ireland in 2021. The average annual Reuse rate per person in Ireland is 10.6 kg per person.

2.2 Regional Level

The development is located in the Local Authority administrative area of South Dublin County Council (SDCC).

The Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, which previously governed waste management policy in the DCC area, has been superseded as of March 2024 by the NWMPCE 2024 – 2030, the new national waste management plan for Ireland.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

National Targets

1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030

2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin

2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030)

3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140-160 per tonne of waste, which includes a €85 per tonne landfill levy introduced under the Waste Management (Landfill Levy) (Amendment) Regulations 2015.

The *South Dublin County Council Development Plan 2022– 2028* [14] sets out a number of objectives and policies for the South Dublin area in line with the objectives of the waste management plan.

Policy and Objectives

Policy IE7: Waste Management
Implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.

- **IE7 Objective 1**
  To encourage a just transition from a waste management economy to a green circular economy to enhance employment and increase the value, recovery and recirculation of resources through compliance with the provisions of the Waste Action Plan for a Circular Economy 2020 – 2025 and to promote the use of, but not limited to, reverse vending machines and deposit return schemes or similar to ensure a wider and varying ways of recycling.
- **IE7 Objective 2**
  To support the implementation of the Eastern Midlands Region Waste Management Plan 2015-2021 or as amended by adhering to overarching performance targets, policies and policy actions.
- **IE7 Objective 4**
  To provide for and maintain the network of bring infrastructure (e.g. civic amenity facilities, bring banks) in the County to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes.
- **IE7 Objective 7**
  To require the appropriate provision for the sustainable management of waste within all developments, ensuring it is suitably designed into the development, including the provision of facilities for the storage, separation and collection of such waste.
- **IE7 Objective 8**
  To adhere to the recommendations of the National Hazardous Waste Management Plan 2014-2020 and any subsequent plan, and to co-operate with other agencies including the EPA in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects.

2.3 Legislative Requirements

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

- Waste Management Act 1996, as amended;
- Environmental Protection Agency Act 1992 as amended;
- Litter Pollution Act 1997 as amended and
- Planning and Development Act 2000 as amended [15]
- Circular Economy and Miscellaneous Provisions Act 2022.

These Acts and subordinate Regulations transpose the relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the Waste Management Act 1996 as amended and subsequent Irish legislation, is the principle of “Duty of Care”. This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal). As it is not practical in most cases for the waste

producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

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

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

2.3.1 South Dublin County Council Waste Management Bye-Laws

The SDCC *"County of South Dublin (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018)"* came into effect in December 2018. These Bye-laws repeal the previous SDCC bye-laws*; South Dublin County Council Household Waste Bye-Laws 2012* and *South Dublin County Council (Storage, Separation at Source, Presentation and Collection of Commercial Waste) Bye-Laws 2007*. The Bye-Laws set a number of enforceable requirements on waste holders and collectors with regard to storage, separation, presentation and collection of waste within the SDCC functional area. Key requirements under these Bye-laws are:

- Kerbside waste presented for collection shall not be presented for collection earlier than 8.00pm on the day immediately preceding the designated waste collection day;
- All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 8:00am on the day following the designated waste collection day;
- Neither recyclable household kerbside waste nor food waste arising from households shall be contaminated with any other type of waste before or after it has been segregated; and
- A management company, or another person if there is no such company, who exercises control and supervision of residential and/or commercial activities in multi-unit developments, mixed-use developments, flats or apartment blocks, combined living/working spaces or other similar complexes shall ensure that:
    - separate receptacles of adequate size and number are provided for the proper segregation, storage and collection of recyclable household kerbside waste and residual household kerbside waste;
    - additional receptacles are provided for the segregation, storage and collection of food waste where this practice is a requirement of the national legislation on food waste;
    - the receptacles referred to in paragraphs (a) and (b) are located both within any individual apartment and at the place where waste is stored prior to its collection;

- any place where waste is to be stored prior to collection is secure, accessible at all times by tenants and other occupiers and is not accessible by any other person other than an authorised waste collector,
- written information is provided to each tenant or other occupier about the arrangements for waste separation, segregation, storage and presentation prior to collection; and
- an authorised waste collector is engaged to service the receptacles referred to in this section of these bye-laws, with documentary evidence, such as receipts, statements or other proof of payment, demonstrating the existence of this engagement being retained for a period of no less than two years. Such evidence shall be presented to an authorised person within a time specified in a written request from either that person or from another authorised person employed by South Dublin County Council.

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

2.4 Regional Waste Management Service Providers and Facilities

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

As outlined in the regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

The SDCC Ballymount Civic Amenity Centre, located c. 920m to the southwest of the development, can be utilised by the residents of the development for certain household waste streams. This centre can accept batteries, metal, paper, clothes and textiles, electrical items, glass bottles and jars, wood and soft plastic. There is also a bring bank located c. 690m to the north of the development at The Walkinstown Green, where glass and aluminium cans can be deposited.

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all Waste / Industrial Emissions Licenses issued are available from the EPA.

3.0 DESCRIPTION OF THE DEVELOPMENT

3.1 Location, Size and Scale of the Development

The proposed development consists:

1. The demolition of the former Chadwicks Builders Merchant development comprising 1 no. two storey office building and 9 no. storage/warehouse buildings ranging in height from 3m – 9.9m as follows: Building A (8,764 sq.m.), Building B (1,293 sq.m.), Building C (two-storey office building) (527 sq.m.), Building D (47 sq.m.), Building E (29 sq.m.), Building F (207 sq.m.), Building G (101 sq.m.), Building H (80 sq.m.), Building I (28 sq.m.), and Building J (44 sq.m.), in total comprising 11,120 sq.m.;

2. the construction of a mixed-use residential and commercial development comprising 588 no. residential apartment units (291 no. one-beds, 238no. two-

beds and 59 no. three-beds), 1 no. 570.91sqm (443sqm indoor space) childcare facility and 6no. no. commercial/retail units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys as follows:

a) Block A comprises 170 no. apartments (103 no. 1 bed-units, 59 no. 2 bed-units and 8 no. 3- bed units) measuring 8 storeys in height.

b) Block B comprises 197 no. apartments (89 no. 1 bed-units, 92 no. 2 bed-units and 16 no. 3 bed-units) measuring 10 storeys in height.

c) Block C comprises 81 no. apartments (44 no. 1-bed units, 16 no. 2-bed units and 21 no. 3-bed units) measuring 12 storeys in height.

d) Block D comprises 140 no. apartments (55 no. 1 bed-units, 71 no. 2 bed-units and 14 no. 3 bed-units) measuring 8 storeys in height.

All apartments will be provided with private balconies/terraces;

3. provision of indoor communal residential amenity (614.14 sq.m.) at ground and first floors of Block A, B , C, ;

4. the construction of 1 no. childcare facility with dedicated outdoor play area located at ground floor of Block B;

5. the construction of 6no. commercial units at ground floor level of Blocks A, B and D, and 1 no. commercial unit at first floor level of Block A as follows: Block A has 1 no. unit at ground floor comprising 455.8 sq.m. and 1 no. unit at first floor level comprising 160.79 sq.m., Block B has 1 no. unit at ground floor comprising 190.96 . and Block D has 4 no. units at ground floor comprising 361.6, 232.3, 238 and 174.9 sq.m.;

6. the construction of 4 no. vehicular entrances; a primary entrance via vehicular ramp from the north (access from Greenhills Road) and 3 no. secondary entrances from the south for access, emergency access and services (access from the existing road to the south of the site) with additional pedestrian accesses proposed along Greenhills Road;

7. provision of 270 no. car parking spaces comprising 240 no. standard spaces (including 6 no. car club spaces) and 13 no. mobility spaces located at surface level and within undercroft car parks within Blocks A, B , C and D, 17 no. commercial/ unloading/ drop-off parking spaces at ground level.

8. provision of 1,269 no. bicycle parking spaces comprising 952 no. residents' bicycle spaces, 10 no. cargo/accessible bicycle spaces in 14 no. bicycle storerooms in surface and undercroft parking areas and 307 no. visitors' bicycle spaces located externally at ground floor level throughout the development;

9. provision of outdoor communal amenity space (3,130.3 sq.m) comprising landscaped courtyards that include play areas, seating areas, grass areas, planting and scented gardens located on podiums at first floor level; provision of communal amenity roof gardens in Block A & B with seating area and planting (746.1 sq.m.) and inclusion of centrally located public open space (6,6650 sq.m.) adjacent to Blocks A, B, C and D comprising grassed areas, planting, seating areas, play areas, water feature, flexible use space and incidental open space/public realm;

10. provision of toucan crossing and all associated road markings and signage from the subject site to a new footpath on northern side of Greenhills Road;

11. development also includes landscaping and infrastructural works, foul and surface water drainage, bin storage, ESB substations, plant rooms, pv panels, boundary treatments, internal roads, cycle paths and footpaths and all associated site works to facilitate the development.

    This application is accompanied by an Environmental Impact Assessment Report (EIAR).

3.2 Typical Waste Categories

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

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

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

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

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

3.3 European Waste Codes

In 1994, the *European Waste Catalogue* [16] and *Hazardous Waste List* [17] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [18], which was a condensed version of the original two documents and their subsequent amendments. This document has been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' [19] (2018). This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, CORs, permits and licences and the EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) codes for typical waste materials expected to be generated during the operation of the development are provided in Table 3.1, below.

Table 3.1 Typical Waste Types Generated and LoW Codes

Waste Material	LoW Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.) *	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

* *Individual waste type may contain hazardous materials*

4.0 ESTIMATED WASTE ARISINGS

A waste generation model (WGM) developed by AWN has been used to predict waste types, weights and volumes expected to arise from operations within the development. The WGM incorporates building area and use and combines these with other data, including Irish and US EPA waste generation rates.

The estimated quantum / volume of waste that will be generated from the residential units has been determined based on the predicted occupancy of the units.

The estimated waste generation for the development for the main waste types is presented in Tables 4.1 and 4.2, below.

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

Waste type	Waste Volume (m^3/week)			
	Residential Block A	Residential Block B	Residential Block C	Residential Block D
Organic Waste	2.36	2.90	1.19	2.11
DMR	16.15	19.84	8.14	15.45
Glass	0.46	0.56	0.23	0.41
MNR	9.39	11.54	4.73	7.35
Total	**28.36**	**34.84**	**14.29**	**25.32**

Table 4.2 *Estimated waste generation for the proposed development for the main waste type*

Waste type	Waste Volume (m^3/week)			
	Commercial Block A	Creche Block B	Commercial Block B	Commercial Block D
Organic Waste	0.21	0.04	0.06	0.34

DMR	2.87	1.55	0.89	4.70
Glass	0.11	0.01	0.03	0.18
MNR	2,90	0.85	0.89	4.70
Total	**5.88**	**2.45**	**1.82**	**9.62**

BS5906:2005 Waste Management in Buildings – Code of Practice [20] has been considered in the calculations of waste estimates. AWN's modelling methodology is based on recently published data and data from numerous other similar developments in Ireland and is based on AWN's experience, it provides a more representative estimate of the likely waste arisings from the development.

5.0 WASTE STORAGE AND COLLECTION

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

- *BS 5906:2005 Waste Management in Buildings – Code of Practice,*
- *EMR Waste Management Plan 2015 – 2021;*
- *Dublin City Council Development Plan 2022 – 2028;*
- Dublin City Council (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018); and
- *DoHLGH, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2023)* [21].

Residential Waste Storage Areas

6 no. dedicated shared Waste Storage Areas (WSAs) have been allocated within the development design for the residential units in the apartment. These shared residential WSAs are located on the ground floor and are in close proximity to the access cores.

The locations of all Waste Storage Areas (WSAs) can be viewed on the drawings submitted with the planning application under separate cover and in Appendix 2 of this report

Commercial Waste Storage Areas

3 no. dedicated shared Waste Storage Areas (WSAs) have been allocated within the development design for the commercial units.

The locations of all Waste Storage Areas (WSAs) can be viewed on the drawings submitted with the planning application under separate cover and in Appendix 2 of this report

Waste Generation

Using the estimated waste generation volumes in Tables 4.1 and 4.2, above, the waste receptacle requirements for MNR, DMR, organic waste and glass have been established for the WSAs. It is envisaged that DMR, MNR, organic and glass waste will be collected on a weekly basis.

Waste Storage Requirements

Using the estimated waste generation volumes in Table 4.1 and 4.2 the waste receptacle requirements, compactor and associated FIBCs (Flexible Intermediate Bulk

Containers) for MNR, DMR, organic waste, glass have been established for the WSAs. These are presented in Table 5.1 and 5.2.

Table 5.1 *Residential waste storage requirements for the development*

Area/User	Bins Required				Equipment	
	MNR*	DMR**	Organic	Glass	FIBC***	Epac Lodestone compactors
Block A WSA (Residential)	-	-	10 x 240L	2 x 240L	-	2
Block A FIBC WSA (Residential)	-	-	-	-	2 x 2m^3 1 x 3m^3	-
Block B1 WSA (Residential)	5 x 1100L	9 x 1100L	6 x 240L	1 x 240L	-	-
Block C WSA (Residential)	8 x 1100L	5 x 1100L	5 x 240L	1 x 240L	-	-
Block B2 & D WSA (Residential)	-	-	16 x 240L	4 x 240L	-	2
Block B2 & D FIBC WSA (Residential)	-	-	-	-	2 x 2m^3 1 x 3m^3	-

Note: ** = Mixed Non-Recyclables*
*** = Dry Mixed Recyclables*
**** = Flexible Intermediate Bulk Containers*

Table 5.2 *Commercial waste storage requirements for the development*

Area/User	Bins Required			
	MNR*	DMR**	Organic	Glass
Block A WSA (Commercial)	3 x 1100L	3 x 1100L	1 x 240L	1 x 240L
Block B WSA (Commercial)	2 x 1100L	3 x 1100L	1 x 240L	1 x 240L
Block D WSA (Commercial)	5 x 1100L	5 x 1100L	2 x 240L	1 x 240L

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

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

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

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

It is proposed that facilities management will avail of a commercially available mini compactor for the DMR and MNR waste streams for the WSAs for Blocks A and B2 & D, referred to as an Epac compactor in this OWMP.

This option will reduce the space needed for the storage of these waste streams, reduce the number of bins stored on site and the number of bins that will need to be transported to the ground floor / staging area for collection. It compresses/compacts the waste into 2 and 3m^3 bags.

Alternative options can be considered in future by the facilities management company, as technologies are developed. Solely for the purpose of ensuring the WSA is sufficiently sized, this plan assumes that the Epac option will be utilised. An image of the Epac mini compactor is provided as Figure 5.2.

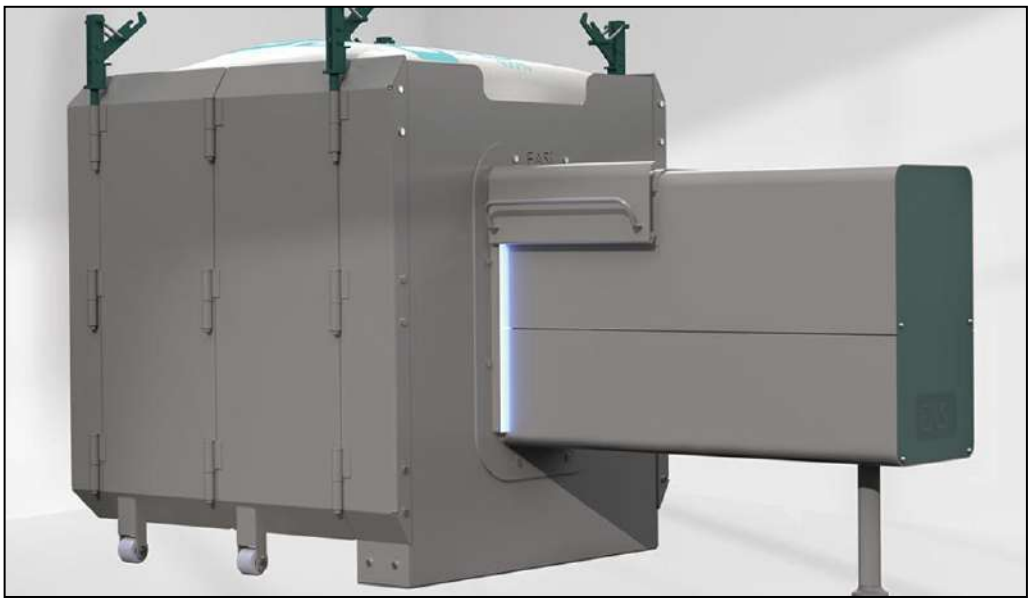


Figure 5.2 *Photo of an Epac Mini Compactor (Source: bnmrecyling Website)*

Receptacles for organic, DMR, glass and MNR waste will be provided in the WSAs prior to first occupation of the development i.e. prior to the first residential unit unit being occupied.

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

5.1 Waste Storage – Residential Units

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

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

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

Figure 5.3 *Example three bin storage system to be provided within the unit design*

Residents will be required to take their segregated waste materials to their designated residential WSA and dispose of their segregated waste into the appropriate bins and/or compactor. Locations of all WSAs can found on the plans submitted with the application.

Space will be provided in the residential units to accommodate 3 no. bin types to facilitate waste segregation at source.

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

Filled FIBCs will be ejected from the compactor onto pallets to ensure easy manoeuvrability. A filled FIBC will be transported using a pallet truck to the appropriate FIBC WSA.

Access to the residential WSAs will be restricted to authorised residents, facilities management and waste contractors by means of a key or electronic fob access. Using the estimated figures in Table 4.1 DMR, MNR, organic waste and glass will be collected on a weekly basis.

Other waste materials such as textiles, batteries, lightbulbs, cooking oil, printer toner/cartridges and WEEE may be generated infrequently by the residents. Residents will be required to identify suitable temporary storage areas for these waste items

within their own units and dispose of them appropriately. Further details on additional waste types can be found in Section 5.4.

5.2 Waste Storage – Commercial Units

The tenants will be required to segregate waste within their unit, into the following main waste types:

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

Tenants will take their waste their allocated commercial WSA.

Suppliers for the tenants should be requested by the tenants to make deliveries in reusable containers, minimize packaging or to remove any packaging after delivery where possible, to reduce waste generated by the development.

If any kitchens/food preparation areas are allocated in unit areas, this will contribute a significant portion of the volume of waste generated on a daily basis, and as such it is important that adequate provision is made for the storage and transfer of waste from these areas to the WSA.

If kitchens are required it is anticipated that waste will be generated in kitchens throughout the day, primarily at the following locations:

- Food Storage Areas (i.e. cold stores, dry store, freezer stores and stores for decanting of deliveries);
- Meat Preparation Area;
- Vegetable Preparation Area;
- Cooking Area;

All bins/containers in the tenant's areas as well as in the WSA will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which wastes can be put in each.

Based on the recommended bin requirements in Table 5.1, DMR, MNR, organic and glass bins will be collected on a weekly basis.

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

5.3 Waste Collection

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

The facilities management company or waste contractor (depending on the agreement) will be responsible for conveying the bins from shared WSAs to their respective designated staging areas for collection. Following this, the waste receptacles will be promptly returned to the WSAs.

The FIBCs will be brought from the FIBC WSAs using a Moffett truck mounted forklift to the waste collection vehicle. Pallets will be returned to the WSAs for reuse.

The locations of the collection areas are such that they will not obstruct traffic or pedestrians (allowing a footway path of at least 1.8m, the space needed for two wheelchairs to pass each other) as is recommended in the Design Manual for Urban Roads and Streets (2022) [22]. A tracking exercise for waste vehicles can be found in Appendix 1 of this report.

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

5.4 Additional Waste Materials

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

Deposit Return Scheme

Most drinks containers can be recycled via the deposit return scheme, such as bottles, cans and tins made from plastic, aluminium or steel can be returned once they are between 150ml and 3 litres in size and have the Re-turn logo on them.

At the shops you can either return the containers:

- Using a Reverse Vending Machine (RVM)
- Manually in the shop

If a shop does not have a RVM but they sell containers with the Re-turn logo, the shop may allow you to manually return containers in store, unless they have a take back exemption.

Locations of RVM machines can be found via the Re-turn website (www.re-turn.ie)

Green Waste

Green waste may be generated from internal plants / flowers. Green waste generated from internal plants / flowers or external landscaping will be placed in the organic waste bins. If substantial green waste is produced by commercial tenants it will be removed by a landscape contractor.

Batteries

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

The commercial tenants cannot use the civic amenity centre. They must segregate their waste batteries and either avail of the take-back service provided by retailers or arrange for recycling/recovery of their waste batteries by a suiltably permited/licenced contractor. Facilties management may arrange collection depending on the agreement.

Waste Electrical and Electronic Equipment (WEEE)

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

As noted above, the commercial tenants cannot use the civic amenity centre. They must segregate their WEEE and either avail of the take-back/collection service provided by retailers or arrange for recycling/recovery of their WEEE by a suitably permitted/licenced contractor. Facilities management may arrange collection depending on the agreement.

Printer Cartridge / Toners

It is recommended that a printer cartridge/toner bin is provided in relevant commercial units. The commercial tenants will be required to store this waste within their unit and arrange for return to retailers or collection by an authorised waste contractor, as required.

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

Chemicals

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

Any waste cleaning products or waste packaging from cleaning products generated in the commercial units that is classed as hazardous (if they arise) will be appropriately stored within the tenant's own space. Facilities management or the tenant will arrange collection depending on the agreement.

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

Light Bulbs

Waste light bulbs may be generated by lighting in the commercial units. It is anticipated that commercial tenants will be responsible for the off-site removal and appropriate recovery/disposal of these wastes. Facilities management may arrange collection depending on the agreement.

Waste light bulbs may be generated from building maintenance works. Such works are usually completed by external contractors or facilities management who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated.

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

Textiles

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

Waste Cooking Oil

If the commercial tenants use cooking oil, waste cooking oil will need to be stored within the unit on a bunded area or spill pallet and regular collections by a dedicated waste contractor will need to be organised as required.

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

Furniture & Other Bulky Waste Items

Furniture and other bulky waste items (such as carpet etc.) may occasionally be generated by the residents and commercial tenants. If residents wish to dispose of furniture, this can be brought a civic amenity centre. If commercial tenants require collection of bulky waste, it will be arranged as required by the tenant.

Abandoned Bicycles

Bicycle parking areas are planned for the development. As happens in other developments, residents sometimes abandon faulty or unused bicycles, and it can be difficult to determine their ownership. Abandoned bicycles will be donated to charity if they arise or facilties management will arrange collection by a licensed waste contractor.

5.5 Waste Storage Area Design

The WSAs will be designed and fitted-out to meet the requirements of relevant design standards, including:

- Be fitted with a non-slip floor surface;
- Provide suitable lighting – a minimum Lux rating of 400 is recommended;
- Be easily accessible for people with limited mobility;
- Be restricted to access by nominated personnel only;
- Be supplied with hot or cold water for disinfection and washing of bins;
- Be fitted with suitable power supply for power washers;
- Have a sloped floor to a central foul drain for bins washing run-off;
- Have appropriate signage placed above and on bins indicating correct use;
- Have access for potential control of vermin, if required; and
- Be fitted with CCTV for monitoring.

The operator of the development, commercial tenants and residents will be required to maintain the resident bins and storage areas in good condition as required by the SDCC Waste Bye-Laws.

6.0 CONCLUSIONS

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

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus contributing to the targets set out in the NWMPCE.

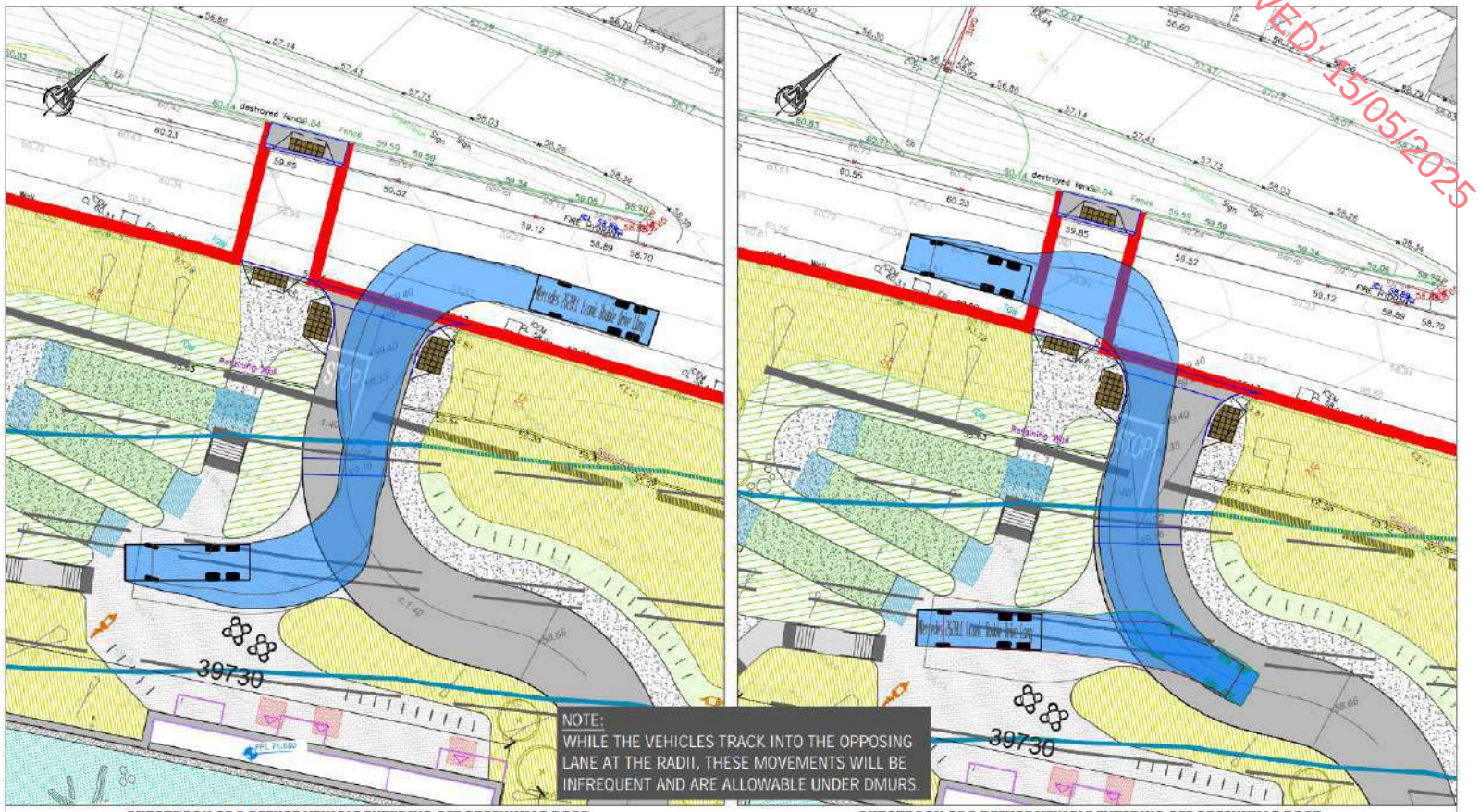
Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the requirements of the SDCC Waste Bye-Laws.

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

7.0 REFERENCES

1. Waste Management Act 1996 as amended.
2. Environmental Protection Agency Act 1992 as amended.
2. Litter Pollution Act 1997 as amended;
4. Regional Waste Management Planning Offices, *The National Waste Management Plan for a Circular Economy 2024 - 2030 (2024).*
5. South Dublin County Council *(SDCC) South Dublin County Council Household & Commercial Waste Bye-Laws (2018)*
6. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998)
7. Department of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002)
8. DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002)
9. DoEHLG, *Taking Stock and Moving Forward* (2004)
10. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (2020).
11. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less*' (2021).
12. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2020* and the *Circular Economy and National Waste Database Report 2021 -*
13. Circular Economy and Miscellaneous Provisions Act 2022
14. South Dublin County Council (SDCC), *South Dublin County Council Development Plan 2022 – 2028 (2022).*
15. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
16. European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
17. Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
18. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
19. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018)
20. BS 5906:2005 Waste Management in Buildings – Code of Practice.
21. Department of Housing Local Government and Heritage *(*DoHLGH), *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (2023).
22. DoHLGH, *Design Manual for Urban Roads and Streets* (2019)

8.0 APPENDIX 1: VEHICLE TRACKING EXERCISE FOR REFUSE TRUCK



AUTOTRACK OF A REFUSE VEHICLE ENTERING OFF GREENHILLS ROAD

AUTOTRACK OF A REFUSE VEHICLE ENTERING OFF GREENHILLS ROAD

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.
This drawing is based upon drawing LRD Application - Site Plan, received 30/10/24. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

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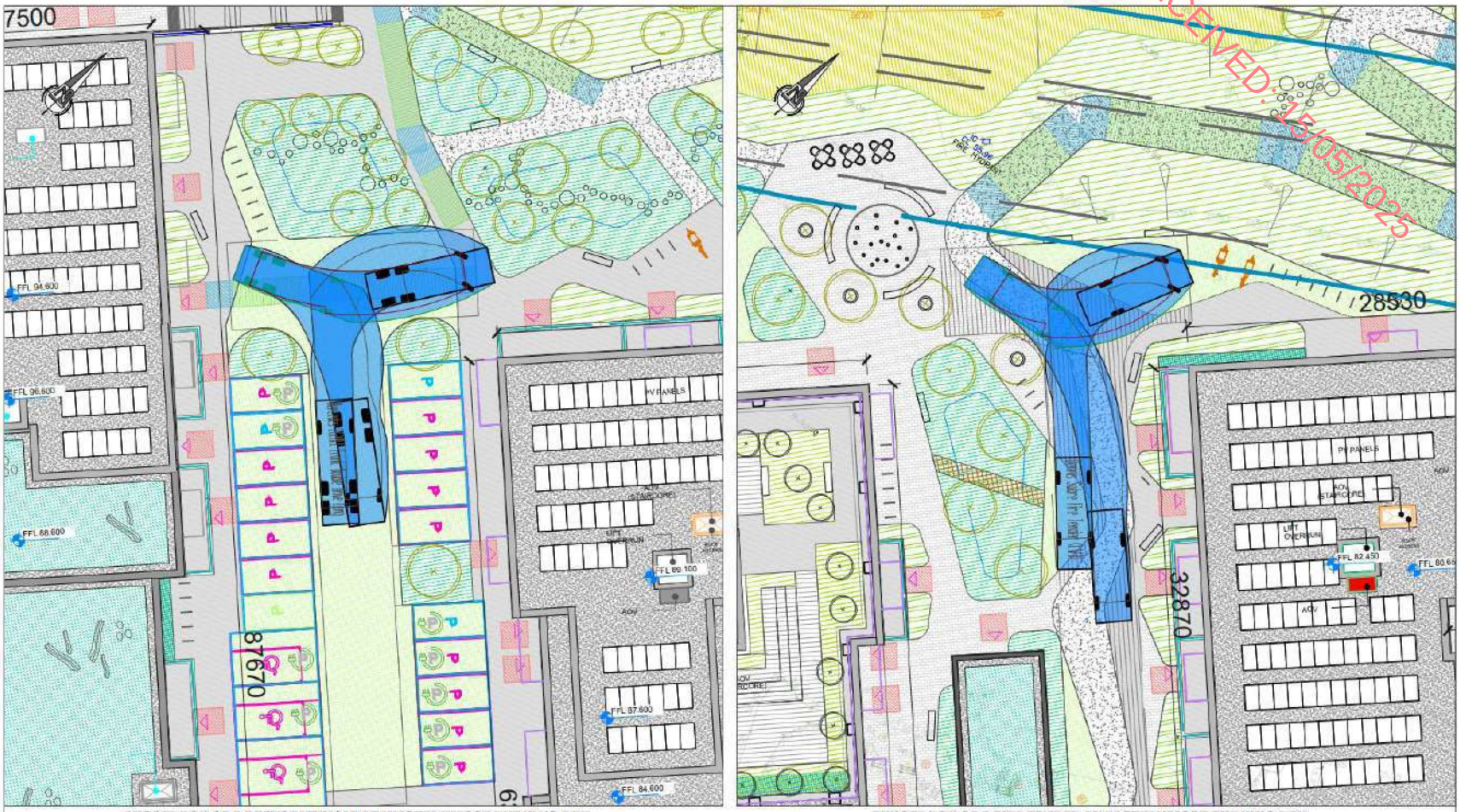
REV	DATE	AMENDMENTS	DRAWN	CHK	APP

Client		Project No. 22-087	Drawing No. NRB-TA-004
Project	Greenvale LRD Dublin	Drawn PB / Checked BMcM 06/11/24	Approved BMcM 06/11/24
Title	AutoTRACKs of a Refuse Vehicle At Proposed Greenhills Road Access	Date 6-Nov-24	Scale @ A3 1:250 / Rev B
NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.		Purpose of Issue: ☐ Draft ☐ As Built ☐ Information ☐ Tender ☐ Approval ☐ Construction	



AUTOTRACK OF A REFUSE VEHICLE AT WESTERNMOST TURNING BAY

AUTOTRACK OF A FIRE TENDER AT EASTERNMOST TURNING BAY

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.
This drawing is based upon drawing LRD Application - Site Plan, received 30/10/24. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	CHK	APP

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Client		Project No. 22-087	Drawing No. NRB-TA-006
Project	Greenvale LRD Dublin	Drawn PB / Checked BMcM 06/11/24	Approved BMcM 06/11/24
Title	AutoTRACKs at Internal Turning Heads	Date 6-Nov-24	Scale @ A3 1:250 / Rev B
	NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.	Purpose of Issue: ☐ Draft ☐ As Built ☐ Information ☐ Tender ☐ Approval ☐ Construction	

9.0 APPENDIX 2: LOCATION OF WASTE STORAGE AREAS AND COLLECTION AREAS

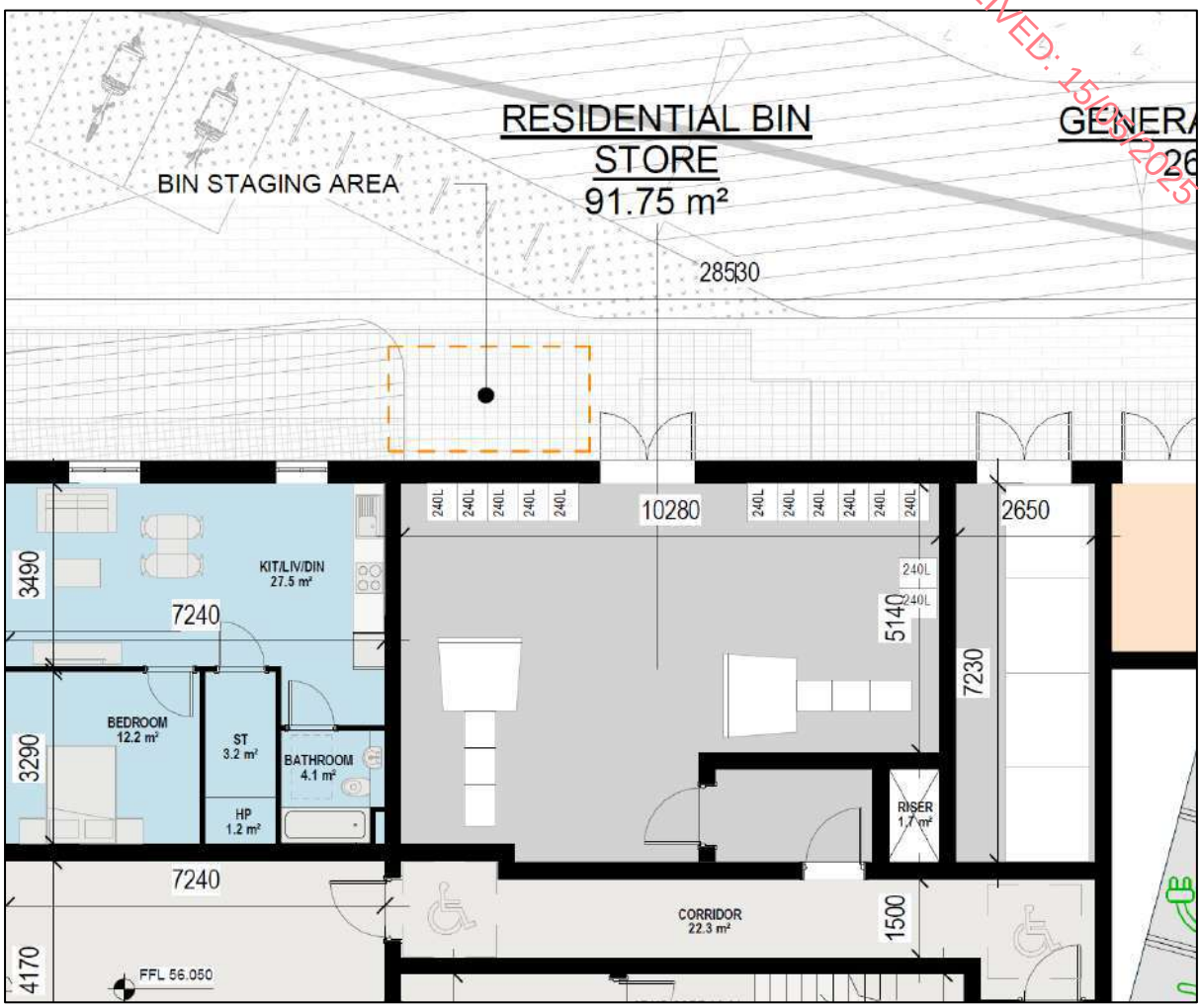

Figure 9.1 *Block A Residential Bin Store and Staging Area*

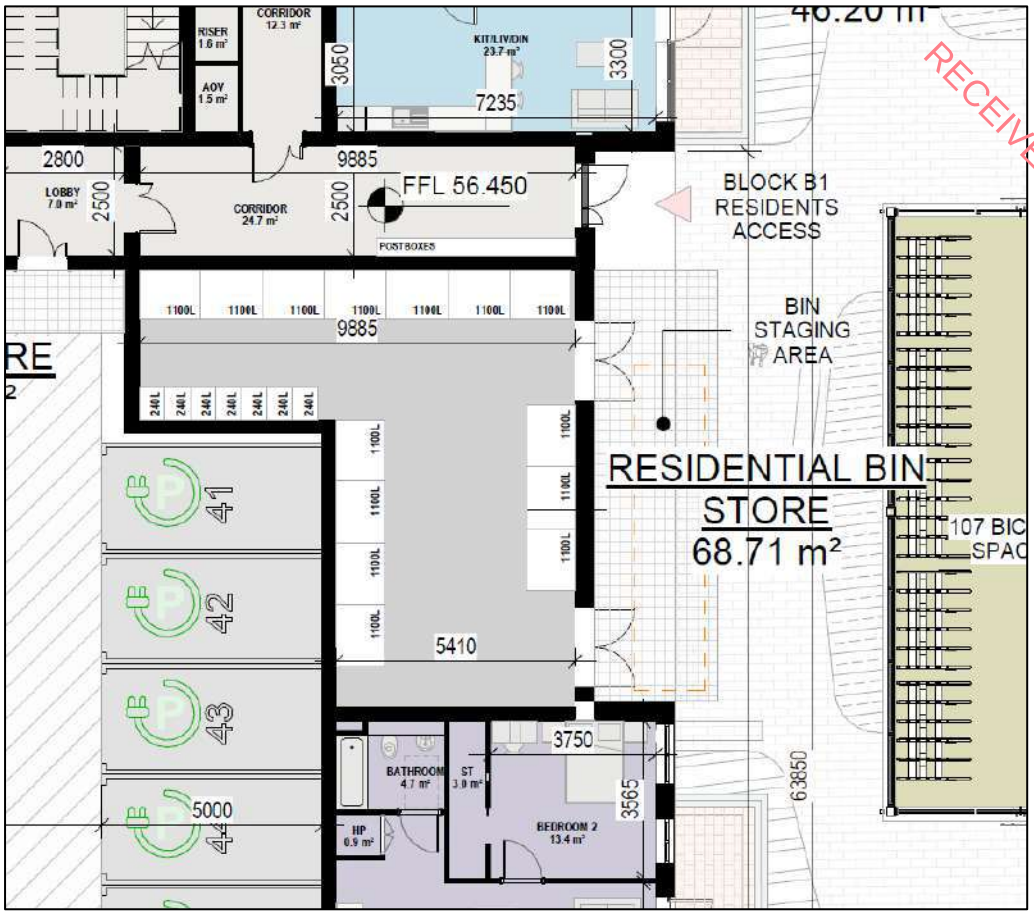

Figure 9.2 *Block B1 Residential Bin Store and Staging Area*

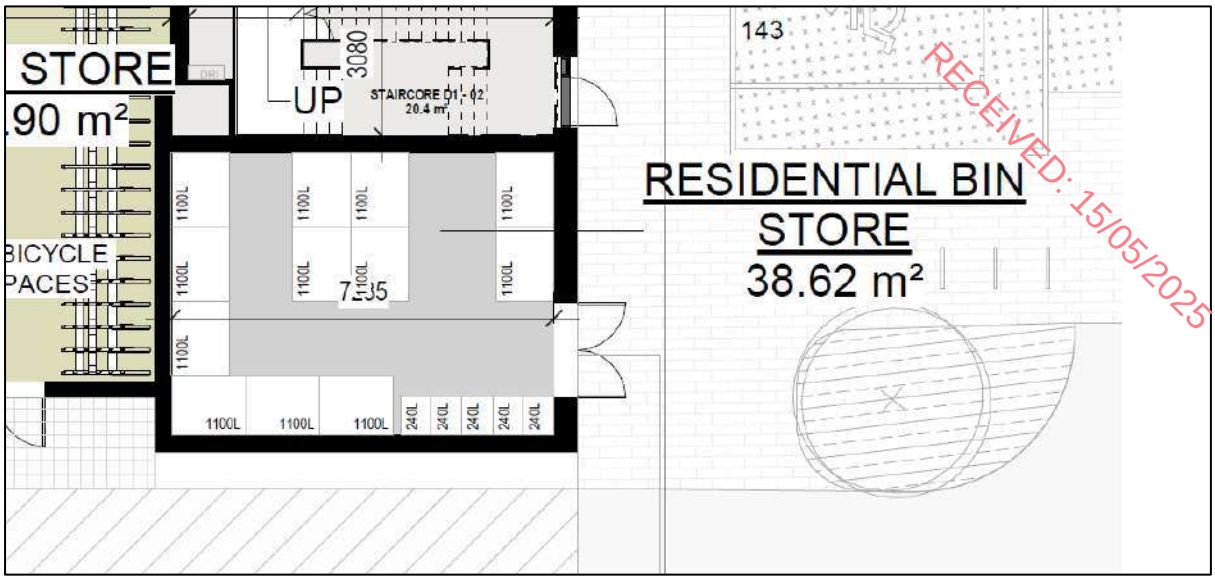

Figure 9.3 *Block C Residential Bin Store (see Figure 9.6, below, for Staging Area)*

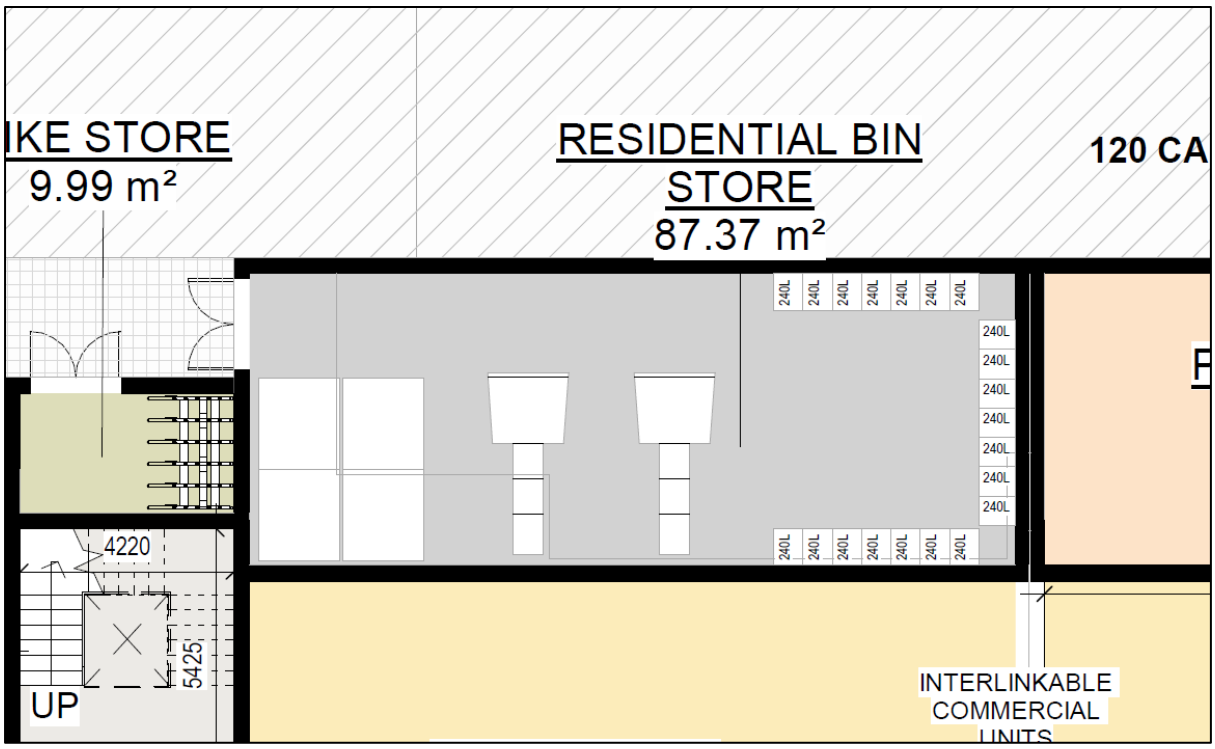

Figure 9.4 *Block B2 and D Residential Bin Store (see Figure 9.7, below, for Staging Area)*

Block A Commercial Bin Store

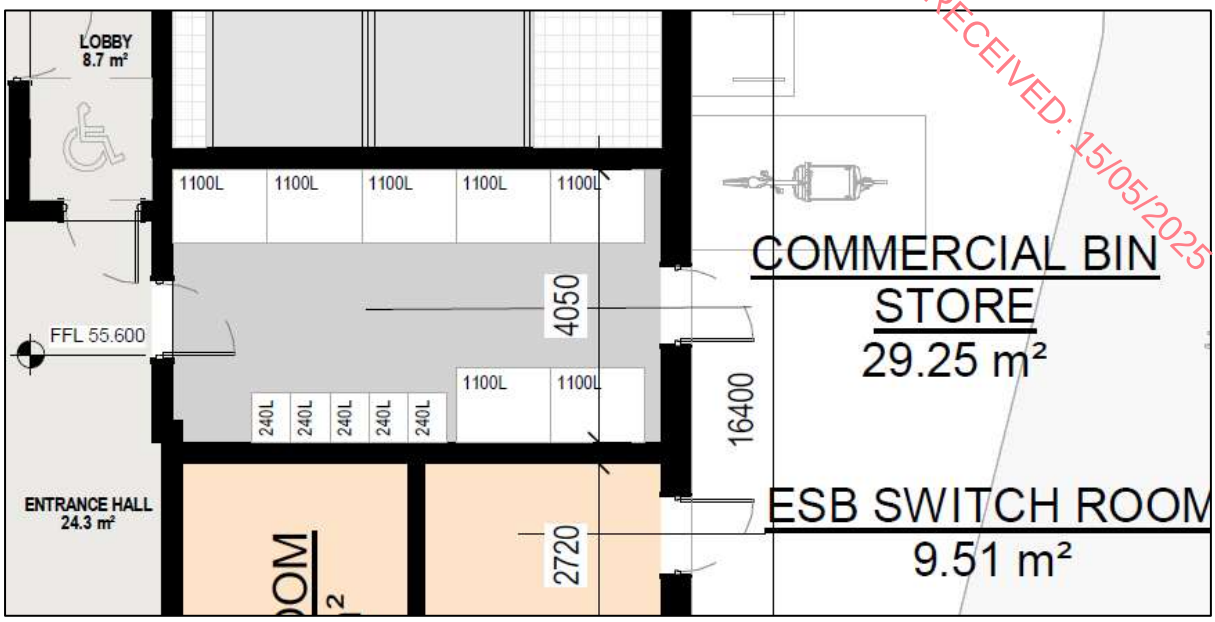

Figure 9.5 *Block A Commercial Bin Store*

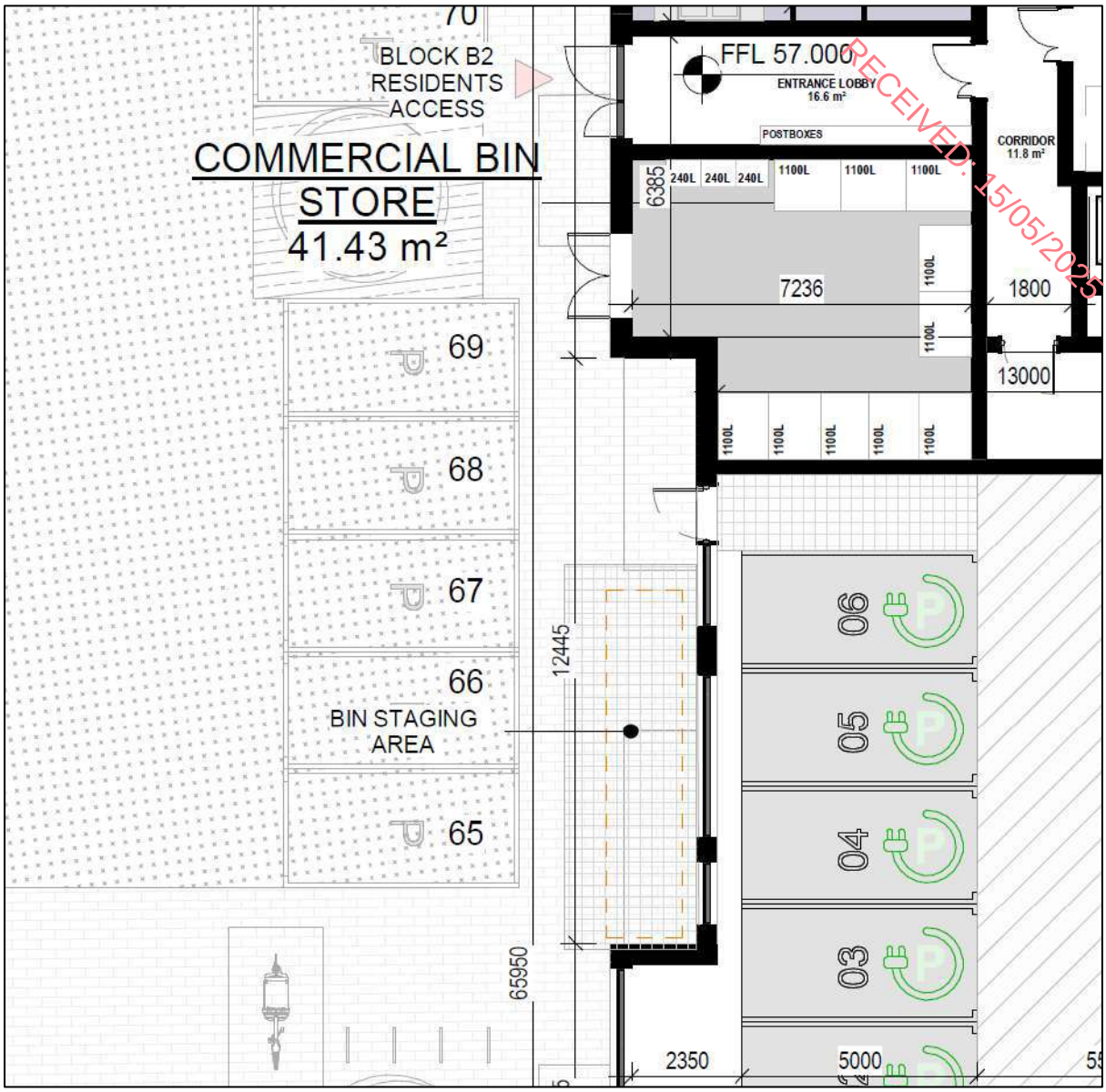

Figure 9.6 *Block B Commercial Bin Store and Staging Area (Staging Area also used for Block C Residential)*

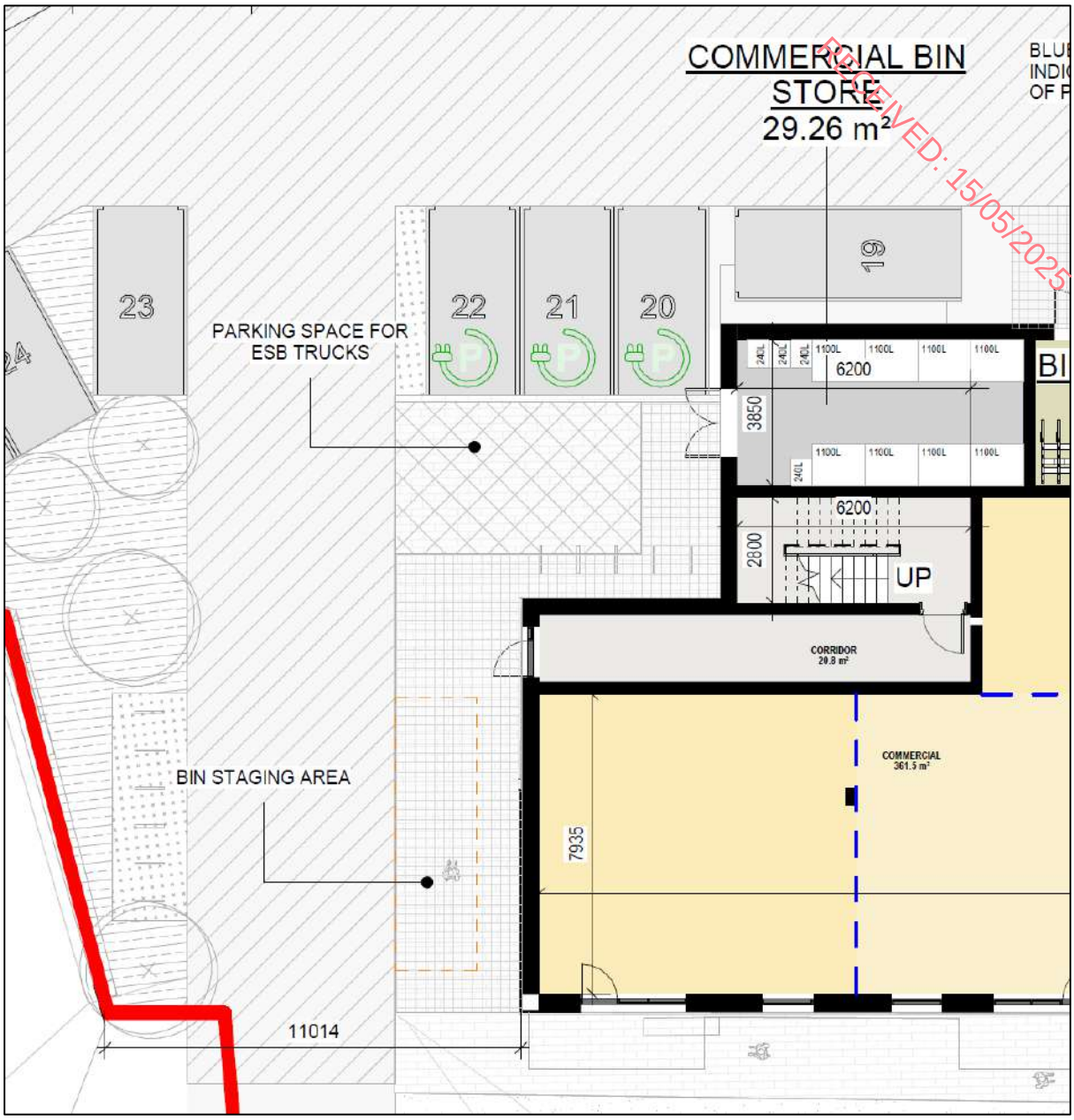

Figure 9.7 *Block D Commercial Bin Store and Staging Area (Staging Area also used for Block B2 and D Residential)*

APPENDIX 14.1

ENGINEERING SERVICES REPORT

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Engineering Services Report

Project:

Residential Development at Greenhills Road, Walkinstown, Dublin 12.

Green Vale Greenhills

Client:

STEEPLEFIELD LTD.

Project Reference No.:

20189

Report Reference No.:

20189-LDE-ZZ-ZZ-RP-0001

Revision	*Author:*	*Date:*	*Approved by:*	*Date*
P	Edvinas Valadka	04-11-2024	Gordon Poyntz	04-11-2024
P2	Edvinas Valadka	09-05-2025	Gordon Poyntz	09-05-2025

Table of Contents

1.0 Introduction

This report has been prepared by Lohan & Donnelly Consulting Engineers and relates to the proposed residential development located at Greenhills Road, Walkinstown, Dublin 12. The Engineering Services Report is to be read in conjunction with all the accompanying documentation, calculations & Engineering drawings. The purpose of this report is to capture and address the following areas relating to the required drainage network system to service the development:

- Foul Water Network
- Surface Water Network
- Water main

2.0 Project Overview

2.1 Site Location

The site is located at Greenhills Road, Walkinstown, Dublin 12, as shown in Figure 1 of map below.

Figure 1: Site Location.
(Source: Google Earth 2020)

2.2 Description of Existing Site

The site is approximately 2.79 hectares in area, located within an industrially surrounded zone and comprises of existing low-rise disused industrial units which are to be demolished as part of the subject proposal. The site currently has 3 vehicular accesses all of which are located along the southern part of the site boundary. The existing development does not have any SuDS measures in place.

Topographical survey of existing site indicates that the site is gradually sloping down from west to east and north to south with a very steep, in places almost vertical ascent/decent transition from the site to the Greenhills Road neighboring the northern site boundary. The western site boundary, abutted to the boundary of the neighboring development is separated via a retaining wall, with a level difference between the site in question and neighboring development of approximately 6 meters.

2.3 Description of Existing Ground Conditions

A ground investigation survey was conducted for the proposed development by Ground Investigations Ireland in-between January and February of 2021 with the following purpose and scope.

- Visit project site to observe existing conditions.
- Carry out 14 No. Window Sample Boreholes to recover soil samples.
- Carry out 10 No. Cable percussion Boreholes to a maximum depth of 4.50m BGL.
- Installation of 3 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

The ground conditions encountered during the investigations are summarized below:

- Tarmacadam or concrete surfacing course to a max. depth of 0.3m BGL
- Brown clayey sandy sub-angular to sub-rounded fire to course gravel or a grayish brown sandy gravelly clay with rage fragment of red brick have been found beneath the surfacing course to a depth of between 0.4m and 2.4m BGL.
- Cohesive deposits described as dark brown/grey sandy gravelly clay with occasional cobbles were encountered beneath the made ground and/or surfacing course.
- Granular deposits described as grey/brown clayey sub-angular to sub-rounded fine to course gravel with occasional cobblers and brown clayey gravelly fine

to coarse sand were encountered beneath the made ground and/or cohesive deposits.

Based on the three groundwater monitoring wells, installed in the boreholes where groundwater was struck, ground investigation report concludes that groundwater was encountered at 2.45m for borehole 'BH04', 1.65m for 'BH06' and 2.7m for 'BH08'. The monitoring wells have been revisited twice after the initial measurements were recorded, 8 and 11 days later. On The 11th day it was noted that for borehole 'BH04' the groundwater level dropped by 13% to 2.76m BGL, for borehole 'BH06' groundwater level dropped by 18% to 1.94m BGL and no results were recorded for borehole 'BH08'.

Ground level for 'BH06' was measured at 55.97 meters above Ordnance Datum (mOD) and 55.36m (mOD) for 'BH08'. The difference in ground level of 0.61m explain the discrepancy in the groundwater table levels between the two boreholes. It is therefore, based on the results of the survey, safe to assume an average water table of 2.35m BGL, which is the average groundwater level between 'BH06' and 'BH08'.

A copy of the initial ground investigations report including borehole logs, recommendations & conclusions is included in Appendix F of this document.

Second ground investigation survey was conducted post the release of 2022-2028 South Dublin County Council Development Plan guidance document, stating that in-ground attenuation tanks are to only be permitted as a last resort, in the event SuDS measures are not feasible. The second survey was conducted on the 31st of August 2023 with the following purpose and scope.

- Carry out 3 No. Trial Pits to a maximum of 1.80m BGL.
- Carry out 3 No. Infiltration tests to determine soil permeability and establish a soil infiltration rate in accordance with BRE digest 365.
- Generate report with tabulated test data and design recommendations.

From the 3 No. Infiltration tests that have been carried, 3 different infiltration rates were recorded respectively. These were 0.037512 m/hr from SA01, 0.030708 m/hr from SA02, and 0.087191 m/hr from SA03, yielding an average infiltration rate of 0.0518 m/hr for the site. Design of all SuDS measures for this project have been based on the average infiltration rate.

A copy of the ground investigations report including exploratory hole logs, recommendations & conclusions is included in Appendix G of this document.

2.4 Description of Proposed Development

- The demolition of the former Chadwicks Builders Merchant development comprising 1 no. two storey office building and 9 no. storage/warehouse buildings ranging in height from 3m – 9.9m as follows: Building A (8,764 sq.m.), Building B (1,293 sq.m.), Building C (two-storey office building) (527 sq.m.), Building D (47 sq.m.), Building E (29 sq.m.), Building F (207 sq.m.), Building G (101 sq.m.), Building H (80 sq.m.), Building I (28 sq.m.), and Building J (44 sq.m.), in total comprising 11,120 sq.m.;

- The construction of a mixed-use residential and commercial development comprising 588 no. residential apartment units (291 no. one-beds, 238no. two-beds and 59 no. three-beds), 1 no. 570.91sqm (443sqm indoor space) childcare facility and 6no. no. commercial/retail units in 4 no. blocks (A-D) ranging in height from 5 to 12 storeys as follows:

a) Block A comprises 170 no. apartments (103 no. 1 bed-units, 59 no. 2 bed-units and 8 no. 3- bed units) measuring 8 storeys in height.
b) Block B comprises 197 no. apartments (89 no. 1 bed-units, 92 no. 2 bed-units and 16 no. 3 bed-units) measuring 10 storeys in height.
c) Block C comprises 81 no. apartments (44 no. 1-bed units, 16 no. 2-bed units and 21 no. 3-bed units) measuring 12 storeys in height.
d) Block D comprises 140 no. apartments (55 no. 1 bed-units, 71 no. 2 bed-units and 14 no. 3 bed-units) measuring 8 storeys in height.

All apartments will be provided with private balconies/terraces;

- provision of indoor communal residential amenity (614.14 sq.m.) at ground and first floors of Block A, B, C,;

- the construction of 1 no. childcare facility with dedicated outdoor play area located at ground floor of Block B;

- the construction of 6no. commercial units at ground floor level of Blocks A, B and D, and 1 no. commercial unit at first floor level of Block A as follows: Block A has 1 no. unit at ground floor comprising 455.8 sq.m. and 1 no. unit at first floor level comprising 160.79 sq.m., Block B has 1 no. unit at ground floor comprising 190.96. and Block D has 4 no. units at ground floor comprising 361.6, 232.3, 238 and 174.9 sq.m;

- the construction of 4 no. vehicular entrances; a primary entrance via vehicular ramp from the north (access from Greenhills Road) and 3 no. secondary entrances from the south for access, emergency access and services (access from the existing road to the south of the site) with additional pedestrian accesses proposed along Greenhills Road;
- provision of 270 no. car parking spaces comprising 240 no. standard spaces (including 6 no. car club spaces) and 13 no. mobility spaces located at surface level

and within under croft car parks within Blocks A, B, C and D, 17 no. commercial/ unloading/ drop-off parking spaces at ground level.

- provision of 1,269 no. bicycle parking spaces comprising 952 no. residents' bicycle spaces, 10 no. cargo/accessible bicycle spaces in 14 no. bicycle storerooms in surface and under croft parking areas and 307 no. visitors' bicycle spaces located externally at ground floor level throughout the development;

- provision of outdoor communal amenity space (3,130.3 sq.m) comprising landscaped courtyards that include play areas, seating areas, grass areas, planting and scented gardens located on podiums at first floor level; provision of communal amenity roof gardens in Block A & B with seating area and planting (746.1 sq.m.) and inclusion of centrally located public open space (6,6650 sq.m.) adjacent to Blocks A, B, C and D comprising grassed areas, planting, seating areas, play areas, water feature, flexible use space and incidental open space/public realm;

- provision of toucan crossing and all associated road markings and signage from the subject site to a new footpath on northern side of Greenhills Road;

- development also includes landscaping and infrastructural works, foul and surface water drainage, bin storage, ESB substations, plant rooms, pv panels, boundary treatments, internal roads, cycle paths and footpaths and all associated site works to facilitate the development.

This application is accompanied by an Environmental Impact Assessment Report (EIAR).

2.5 Foundation Details

In-line with ground investigation survey conducted at the site and its recommendations, piled foundations are proposed for the development. Typical foundation sections can be found on drawing 20189-LDE-ZZ-ZZ-DR-SC-3S01.

3.0 Foul Water Network

3.1 Existing Foul Water Drainage Infrastructure

Irish Water drainage record map shows an existing 225mm diameter foul water sewer located in close vicinity to the proposed development. The sewer originates from south-eastern direction, wraps around the outside of the southern and eastern site boundary, and turns north-east, continuing towards the Walkinstown roundabout. Irish Water drainage record map enclosed in Appendix A of this document.

3.2 Proposed Foul Water Drainage Infrastructure

The foul water drainage infrastructure for the proposed development has been designed and is to be constructed in accordance with Irish Water's "Code of Practice for Wastewater Infrastructure (Document IW-CDS-5030-03)", "Wastewater Infrastructure Standard Details (Document IW-CDS-5030-01)" and the Building Regulation requirements.

To service the development, a 300mm diameter foul water pipe will be provided, commencing from the south-west corner of the site, extending to the last foul water manhole on site 'FW04', located on the north-east corner of the site. The foul water will then flow towards the existing foul water manhole 'EX. FW06' located north-east of the site, on Greenhills Road, discharging all the foul water generated from the proposed development. For connection details, refer to drawing "20189-LDE-07-00-DR-SC-1C01a-d".

Foul water flow rates for the proposed development are tabulated in table 3.1 below. For full flow rate and pipe capacity calculations refer to Appendix C of this document.

	No. of Units	Occupancy	Flow per person, per day (Liters)	Daily Discharge (l/day)	10% Infiltration Allowance	Dry Weather Flow (DWF) (l/s)	Peak Dry Weather Flow (6DWF) (l/s)
Apartments	588	1588	150	238200	262020	3.032	18.196
Commercial	-	60	50	3000	3300	0.038	0.229
Residential Amenity	-	446	40	17840	19624	0.227	1.363
Creche	-	74	50	3700	4070	0.047	0.283
Total	-	-	-	260040	286044	3.344	20.064

Table 3.1: Wastewater flow rates for Proposed Development.

Table 3.1 above is generated in accordance with "Code of Practice for Wastewater Infrastructure (Document IW-CDS-5030-03)" Section 3.6, Appendix C, and Section2.2.5 of Appendix B. For full foul water drainage infrastructure scheme for theproposed development refer to drawing "20189-LDE-07-00-DR-SC-1C01a-d".

Pre-connection enquiry form (Reference No. CDS23008409) was submitted on the 6th of November 2023 to new connections department within Irish Water to determine whether a connection for the proposed development is feasible and could be established. Confirmation of feasibility from Irish Water has been received on the 8th of January 2024 stating that a foul water connection for the proposed development is feasible, subject to upgrade works.

The confirmation of feasibility letter, with regards to the feasibility of a wastewater connection states the following:

"*In order to accommodate the proposed connection, upgrade works are required to increase the capacity of Uisce Éireann network in the area. Uisce Éireann currently has a project which will provide the necessary upgrade and capacity. The*

Walkinstown Road Upgrade Project is in an early (route optioneering) phase and currently, there is no delivery time available."

"*The Development can be facilitated at SO11300702 after the completion of the Walkinstown Sewer Upgrade project scheduled for completing Q4 2025, subject to change.*

The Applicant must investigate a connection to SO11300704. The 225mm sewer between may be SO11300704 and SO11300702 will need to be assessed to assure that adequate capacity exists and realigned if necessary. Only if this not feasible will a parallel sewer be considered. The details will be agreed with Irish Water at a Connection Application stage.

The connection will further require a network extension on Greenhills Road (length to de determined based on final design)"

All on-site generated wastewater, in accordance with Irish Water's request is out falling to an existing manhole located on Greenhills Road, SO11300704 (i.e., denoted as Ex. FW01 on drawing 20189-LDE-07-00-DR-SC-1C01d). As stated by Irish Water above, a capacity assessment of the existing manhole and the associated sewer will be required. Should the sewer not have the required capacity to facilitate the proposed development, a new sewer parallel with the existing will be required. Assessment of existing sewer and further details will be agreed with Irish Water post planning, at connection application stage, as outlined in the Confirmation of Feasibility letter. Full Confirmation of Feasibility Letter is enclosed in Appendix B of this document.

Wastewater infrastructure drawings have been forwarded to Irish Water's design department on 23/10/2024 for full review in order to achieve design acceptance with Irish Water's relevant design guidance documents and standard details. letter of design acceptance letter from Irish Water is expected to be received imminently.

4.0 Surface Water Network

4.1 Existing Surface Water Drainage Infrastructure

Irish Water drainage record map shows an existing 225mm diameter surface water sewer located on the access road east of the development, parallel to the Chadwicks Plumb Centre. The sewer commences near the junction of the access road and Greenhills Road and continuous towards the south-east direction. Irish Water drainage record map enclosed in Appendix A of this document.

4.2 Proposed Surface Water Drainage Infrastructure

The surface water drainage infrastructure for the proposed development has been designed and is to be constructed in accordance with "Greater Dublin Strategic Drainage Study (GDSDS) Regional Drainage Policies Technical Document – Volume 2, New Developments, 2005, "Greater Dublin Regional Code of Practice Works" and the Building Regulation requirements.

It is proposed to provide a 225 mm diameter surface water pipe to service the development. Surface water collected from within the site boundary will flow into the last manhole on site "SW03", from there the surface water will flow into intermediate manholes "SW02 & SW01" located on the eastern access road. Finally, the surface water will discharge into the existing 225mm surface water sewer located on the access road parallel to Chadwicks Plumb Centre, south-east of the proposed development via a saddle connection. For connection details, refer to drawing "20189-LDE-07-00-DR-SC-1C01a".

4.3 SuDS Measures Considered

As a requirement outlined in the "Greater Dublin Regional Code of Practice for Drainage Works" document, Version 6.0, enforced in collaboration with several different councils within Ireland, including South Dublin City Council (where the proposed development will be located), all new developments must incorporate

sustainable urban drainage system (SuDS). Therefore, the proposed development will implement (SuDS) as an approach to manage the surface water within the site, reducing, delaying, and purifying the run-off from the site, hence lowering the strain and the pollution content on the existing public sewer. The following SuDS measures have been considered by L&D to determine which measures are feasible and can be incorporated into the proposed development.

SuDS Measure Considered	Incorporated within Design?	Comments
Extensive Green Roof	N	To omit the requirement for in-ground attenuation tanks, all surface water generated on the roof, requires to be attenuated on the roof. This requirement, in-line with 2022-2028 SDCC development plan cannot be facilitated should green roofs be considered.
Intensive Green Roof	Y	It is proposed to provide intensive green roof gardens over some of the proposed blocks.
Swales	Y	A dry swale has been proposed.
Filter Drains	N	Insufficient space within the site.
Permeable Paving	Y	Permeable paving is proposed throughout all paved areas throughout the full extent of the development.
Petrol Interceptor	Y	Class 2 Petrol interceptors are proposed in both undercroft car parks serving block A and blocks C & D. Petrol interceptors are connected to the surface water sewer prior to surface water discharging into the external foul water manhole outside the car park.
Attenuation Tank	N	No underground attenuation tanks permitted in line with new 2022-2028 SDCC development plan.
Rain Gardens	Y	Rain Gardens are proposed to be used in between block A-B & in-between Block B and the existing Greenhills Embankment.
Tree Pitts	Y	Tree Pitts are proposed to be used along the full extent of the southern site frontage & in between Block C D – B & B – A.
Detention Basins, Retention Ponds, Stormwater Wetlands	N	Insufficient space within the site.

Rainwater Harvesting	N	No Rainwater harvesting is proposed within the development.
Hydrobrake (Site Run-off Control)	Y	Hydrobrake is proposed to be used, installed on the last surface water manhole within the site to limit the outfall rate leaving the development to 8.021 l/s.

4.3.1 Permeable Paving

It is proposed to incorporate a permeable paving system into the paved areas surrounding the development, with the aim of eliminating any run-off from the site in times of light/heavy precipitation and 1 in 100-year storm events. All rainwater generated directly on the permeable paving, will be treaded, temporary stored in heavy rainfall events and infiltrated into the sub-soil. A minimum of 250mm depth of 63mm-10mm subbase with approximately 30% voids is to be used to provide additional subground storage volume required. The intention is to provide a sustainable form of storm water source control within the site that will eliminate any runoff from the site, retaining the runoff within the pavers/bedding, promoting evaporation, and facilitating infiltration into the sub-soil. The feasibility of this proposal has been carefully reviewed and necessary ground investigation works carried out. The results of the additional ground investigation works carried out yielded a good infiltration rate for the site, rendering this proposal feasible.

The total area of permeable paving equates to 6319m^2, considering the recorded infiltration rate and 30% allowance for climate change, this yields a required attenuation volume of 365.38m^3. Provided attenuation volume has been calculated at 473.93m^3. Refer to Appendix G for ground investigation report/results and Appendix D for permeable paving storage & infiltration calculations.

4.3.2 Blue Roof

It is proposed to provide extensive, pebbled & paved blue roofing systems, covering 100% of the total roof area with the aim of reducing runoff from the site in times of precipitation and remove the atmospherically deposited urban pollutants. A blue roof

will act as a roof level attenuation tank, omitting the requirement for any in-ground attenuation tanks. In normal rain events, rainwater on the blue roof will be absorbed by the vegetation layer. For heavy or 1 in 100-year storm events, when the vegetation layer is no longer capable of retaining any more water, the water will then be deposited into a 100mm deep "attenuation cell" layer and released into the in-ground surface water sewer at a controlled rate. All blue roof outlets will be fitted with a flow control device, limiting the combined flow of water leaving the roof areas at 4.0 l/s. In a 1:100yr storm event, with 30% increase in storage volume to allow for climate change and total blue roof area of 13105m^2, the total required attenuation volume equates to 928.39m^3. Refer to Appendix D for blue roof attenuation calculations. The total provided attenuation by the blue roofs is 1310.5m^3.

4.3.3 Tree Pits

It is proposed to provide tree pits along the southern frontage of the development as can be seen on drawing "20189-LDE-07-00-DR-SC-1C01a". The tree pits will provide a natural source of surface water infiltration & attenuation with the intent of attenuating the adjacent and cycle path and hard standing access roads, thus negating the need for in ground attenuation storage. To enable infiltration into the sub-soil, the tree pits will be interlinked together via a 150mm perforated pipe. In a 1:100yr storm event, with 30% increase in storage volume to allow for climate change, incorporating the infiltration tests results, total required volume to be attenuated & infiltrated equates to 196.931m^3. While the provided attenuation storage is 417.984m^3. Refer to Appendix G for ground investigation report/results and Appendix D for tree pit storage & infiltration calculations.

4.3.4 Rain Gardens

It is proposed to provide rain gardens in-between blocks A – B and in-between block B and the existing to be retained Greenhills Road embankment. The key function of rain gardens in this instance is to treat the excess surface water run-off from the existing to be retained embankment. Run-off from the embankment will be directed to the rain gardens. The initial run-off will be taken up by the plant and shrubs, after which the

water will migrate through the rain garden construction, be temporarily stored and infiltrated into the sub-soil thereafter. For a heavy rainfall event, to mitigate any potential over flooding for any specific rain garden, a 150mm diameter perforated pipe will be provided, interlinking the rain gardens to equally distribute the accumulated surface water. For a 1:100yr storm event, with 30% increase in storage volume to allow for climate change, the total required volume to be attenuated & infiltrated equates to 134.939 m^3. While the provided attenuation storage is 173.969m^3. Refer to Appendix G for ground investigation report/results and Appendix D for rain garden storage & infiltration calculations.

4.3.5 Dry Swale

It is proposed to provide a shallow dry swale in the open space in-between block B and the existing to be retained Greenhills Road embankment. The swale under light/normal participation events would be dry and collect the adjacent rainwater via the 1:4 sloped sides. During extreme rainfall events/1 in 100-year storm events, the swale could potentially fill up do a depth of 150mm above the base layer. For a heavy rainfall event, to mitigate any potential over flooding of the swale, a 150mm diameter perforated pipe will be provided, interlinking the swale with the adjacent rain gardens to equally distribute the accumulated surface water. For a 1:100yr storm event, with 30% increase in storage volume to allow for climate change, the total required volume to be attenuated & infiltrated equates to 25.246m^3. While the provided attenuation storage is 102.15m^3. Refer to Appendix G for ground investigation report/results and Appendix D for rain garden storage & infiltration calculations.

4.3.6 Hydro-brake

The maximum 1 in 100-year run-off for the site has been calculated to be 8.021 l/s, which is both equal to the combined restricted flow of water leaving the blue roofs and the calculated Q-Bar. To ensure that the existing surface water sewer is not over capacitated, in the event of a storm greater than 1 in 100 year, the flow of surface water leaving the last manhole “SW03” on site (as per Greater Dublin Regional Code of Practice for Drainage Works, Rev 6) will be limited to 8.021 l/s via a hydro-brake, a

flow control device capable of managing the flow rate of water. Refer to Appendix E for Q-Bar calculations.

4.3.7 Petrol Interceptor

All surface water from the car parks will go through a petrol interceptor to separate any hazardous chemicals and petroleum prior to joining the externally situated surface water sewer.

4.4 Interception Storage

Interception storage refers to precipitation which will be stored and intercepted by certain alleviation measures, preventing the rainwater from contacting and being absorbed by the subgrade. The Greater Dublin Strategic Drainage Study (GDSDS) document states that a minimum of 5mm, and preferably 10mm of interception storage must be provided. The development comprises of blue roofs, permeable paving/asphalt and grassed areas. The total impermeable area for the development amounts to 18239m^2. To successfully intercept 10mm of rainwater leaving the development the interception volume must equate to:

18239 x 0.01 = 182.39m^3

4.4.1 Blue Roofs

The area of blue roofs provided for the development amounts to 13105m^2. The blue roof system will have 100mm deep attenuation cells with 95% void space, which equals to a total rainwater interception volume of:

Interception provided = 1244.975m^3

4.4.2 Permeable Paving

The area of permeable paving/asphalt amounts to 6318m^2. The 63 – 10mm coarse aggregate 250mm sub-base, forming the permeable paving system has a 30% void

ratio. This void ratio will be utilized as interception storage. The permeable paving accounts for itself only, in accordance with Table 24.6 of CIRIA SuDS Manual 2015. The interception storage volume provided within the 250mm sub-base equates to the following:

Interception provided = 473.95m^3

4.4.3 Rain Gardens

The area of rain gardens provided for the development amounts to 774m^2. The impermeable area to be drained to the rain gardens (1607m^2) is less than 5 times the surface area of the rain gardens (3870m^2), hence it achieves compliance in accordance with Table 24.6 of CIRIA SuDS Manual 2015.

Interception provided = 173.969m3

4.4.4 Dry Swale

The area of dry swales provided for the development amounts to 227m^2. The impermeable area to be drained to the swale (291m^2). In Accordance with Table 24.6 of CIRIA SuDS Manual 2015, the base of the swale can drain up to a maximum of 25 times the surface area of the swale (5675m^2). During extreme rainfall events (1 in 100-year storm events), the swale could potentially fill up to a depth of 150mm above the base layer.

Interception provided = 34.05m^3

The total interception storage provided for the entire development amounts to 1925.344m^3, more than both the minimum 5mm storage requirement and the recommended 10mm storage capacity, in accordance with GDSDS code of practice document.

Refer to table 4.4.1 below run-off coefficients of each surface type on site and table 4.4.2 below for a summary of the required and provided attenuation volume for each SuDS feature.

Surface Type	Area (m^2)	Surface Type	Run-off Coefficient
Permeable Paving	6319	Permeable	0.6
Green/Blue Roof	13105	Permeable	0.6
Tree Pits	948.23	Permeable	0.15
Raingardens	774	Permeable	0.15
Swale	227	Permeable	0.15
Grass	4351.503	Permeable	0.15
Hardstanding Roads/paths	2206.267	Hardstanding	0.8

Table 4.4.1 – Surface Types and corresponding run-off co-efficient

SuDS Feature	Attenuation Required (m^3)	Factored Catchment Area (m^2)	Provided Attenuation (m^3)
Blue Roof	928.39	13105	1310.5
Perm. Paving	365.38	6319	473.93
Swale	25.246	291	102.15
Tree Pits	196.931	2159	417.984
Raingarden	134.941	1607	173.969

Table 4.4.2 – SuDs required and provided attenuation.

5.0 Water Main

5.1 Existing Water Main (Outside Site Boundary)

Irish Water drainage record map shows an existing 101.6mm diameter uPVC water main located on the service road, parallel to the southern boundary with several extensions to service other nearby developments. Another 101.6mm diameter Cast-Iron water main can be seen on Greenhills Road, parallel to the northern site boundary, continuing towards the Walkinstown roundabout. Irish Water drainage record map enclosed in Appendix A of this document.

5.2 Existing Water Main (Inside Site Boundary)

Irish Water drainage record maps indicates a 101.6mm uPVC water main inside the site boundary, situated within the western part of the development. The water main is shown to have two separate extensions, one extension connected perpendicularly to the existing water main parallel to the southern site boundary, the other connected to the existing water main south-west of the development.

The existing water main was serving the previous development which is to be demolished for the following reasons:

1. Existing water main layout is not compliant with Irish Water's code of practice or the structural layout of the proposed development (i.e., existing water main is currently located under the proposed structures).
2. Existing water main does not have sufficient capacity to service the new proposed development.

Furthermore, another existing water main is present in the northern part of the development. This water main is a 1200mm diameter ductile iron watermain and runs through the north-east section of the site. This key trunk watermain, originating from

the Cookstown reservoir, supplies a significant portion of Dublin's water, serving an estimated 15-20% of the city's population.

The watermain crosses the site from Greenhills Road (north), exiting into the adjacent Chadwicks plumbing development (north-east). Following standard practice and Irish Water regulations, a "Building-over or near an Irish Water Asset Application form" was submitted to the Irish Water Diversions Department. The proposed development plans to create an "Active Frontage" plaza between Greenhills Road and the north-east section, prioritizing pedestrian connectivity and vehicular access. Within the confirmation of feasibility letter, Irish Water have stated the following instructions with regards to the existing 1200mm diameter water main.

"*The proposed Development indicates that Uisce Éireann assets are present on the site. The Developer has to demonstrate that proposed structures and works will not inhibit access for maintenance or endanger structural or functional integrity of the assets during and after the works. Drawings (showing clearance distances, changing to ground levels) and Method Statements should be included in the Detailed Design of the Development. A wayleave in favour of Uisce Éireann will be required over the assets that are not located within the Public Space. For design submissions and queries related to diversion/build near or over, please contact UÉ Diversion Team via email address diversions@water.ie*"

Given the importance of this watermain, Irish Water has requested additional information beyond the usual scope required for less critical assets. After reviewing the proposed landscaping and drainage drawings, Irish Water expressed concern about the impact on the watermain. The plans include an internal access road and soft landscaping, with elevated topography directly above the watermain. The elevation is necessary to bridge the height difference and create a vehicular/pedestrian linkage between Greenhills Road and the proposed development.

Co-ordination with Irish Water's diversions department commenced in November of 2023. To address Irish Water's concerns regarding the proposed development and the

subsequent knock-on effect on the existing 1200mm diameter watermain, we have been requested to engineer a design which has the capability to retain the scheme for the proposed development and at the same time not compromise the structural integrity of the watermain and the associated excavation time which would be required in an emergency repair works or maintenance scenario. The proposed design aimed to achieve this difficult objective involves providing means of excavating down to the invert level (i.e., bottom of the 1200mm diameter water main) without the need of providing temporary works and using lightweight engineered granular fill with a net density of approximately 5 times lower than that of a conventional fill. The design proposes to use a contiguous piled wall with a design life of 60 years where the cover over the existing watermain is greater than 3.0m. The contiguous piled wall will act as a retaining wall, enabling Irish Water to excavate & service the watermain in an emergency scenario without the need of installation of temporary works. The engineered fill will be used to achieve the proposed elevated topography for the soft landscape/access road without increasing the surcharge loading on the existing watermain and in turn increasing the risk of compromising its structural integrity. Refer to drawings 20189-LDE-Z-Z-00-DR-SC-(SK003-SK004), enclosed as part of this planning submission for further details.

Geotechnical consultant experts Ayesa have undertaken the design of the contiguous piled wall. Refer to Appendix H for a comprehensive geotechnical design report and associated drawings.

Co-ordination with the Diversions Department within Irish Water has now been complete, propose design, as described above, has been accepted by Irish Water on 19/09/2024. Refer to Appendix I for confirmation of feasibility letter (ref. DIV21274) issued by Irish Water's diversion department on 21/10/2024, stating the proposal can be facilitated.

5.3 Proposed Water main

The water main infrastructure for the proposed development has been designed and is to be constructed in accordance with Irish Water's "Code of Practice for Water Infrastructure (Document IW-CDS-5020-01)", "Water Infrastructure Standard Details (Document IW-CDS-5020-03)" and the Building Regulation requirements.

To service the development, it is proposed to provide a 200mm MDPE (medium density polyethylene) type PE-80 water main. The water main will be connected to the plant rooms where the water distribution system is located, distributing the water to the residing residents of the apartment complexes. To comply with guidance specification for fire hydrants, offline & on-line fire hydrants will be provided along the water main to provide full coverage of the proposed development in the event of a fire. The water main will exit the proposed development in the north-east corner and connect to the newly laid 200mm diameter water main as per the conditions set out in Irish Water's confirmation of feasibility letter. Prior to exiting the site, a boundary box and telemetry kiosk will be installed to measure the water usage for the development.

Pre-connection enquiry form (Reference No. CDS23008409) was submitted on the 6th of November 2023 to new connections department within Irish Water to determine whether a connection for the proposed development is feasible and could be established. Confirmation of feasibility from Irish Water has been received on the 8th of January 2024 stating that a water main connection for the proposed development is feasible, subject to upgrade works.

The confirmation of feasibility letter, with regards to the feasibility of a water main connection states the following:

"*In order to accommodate the proposed connection, approximately 430m of a new 200mm ID pipe is required to be laid and connect the site development to the existing 12''CI main near Walkinstown Cross roundabout.*"

To comply with the condition above and achieve a feasible water main connection for the development, a new 200mm ID ductile iron water main is to be laid for approximately 500 meters. The new water main is to be parallel to the existing 150mm uPVC water main located on Greenhills road. The newly laid water main will be used as a connection point for the proposed development. Confirmation of feasibility letter from Irish Water enclosed in Appendix B within this document.

Water infrastructure drawings have been forwarded to Irish Water's design department on 23/10/2024 for full review to achieve design acceptance with Irish Water's relevant design guidance documents and standard details. letter of design acceptance letter from Irish Water is expected to be received imminently.

6.0 Flood Risk

As per the Flood Risk Assessment, report ref. (20189-LDE-ZZ-ZZ-RP-0002), the site is in a flood zone type C and therefore has a low probability of experiencing a flood event. It is therefore our opinion that the risk of flooding at this site and the risk of flooding due to the development of this site is minimal and within acceptable limits.

7.0 SDCC Development Plan 2022-2028

The South Dublin County Council (SDCC) Development Plan 2022-2028 sets out a vision to make south Dublin County a place that communities are proud of, that business can thrive in and that will help to live greener and healthier lives. There are several policies and objectives contained within the plan that all contribute towards this vision.

7.1 SDCC Chapter 4 – Green Infrastructure

Policy G14 of the SDCC Development Plan specifies the objectives for the provision of SuDS. The policy states that developments *"Require the provision of Sustainable Drainage Systems (SuDS) in the County and maximise the amenity and biodiversity value of these systems."*

GI14 Objective 1: To limit surface water run-off from new developments through the use of Sustainable Urban Drainage Systems (SuDS) using surface water and nature-based solutions and ensure that SuDS is integrated into all new development in the County and designed in accordance with South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide

- The proposed surface water design for the development incorporates various SuDS features that are in line with SDCC Sustainable Drainage Systems (SuDS) Explanatory Design and Evaluation Guide 2022. The use of SuDS will help limit surface water run-off from the proposed development. The run-off from the site has been limited to $Q_{BARrural}$ for the 100-year rainfall event with a 30% allowance for climate change.

GI4 Objective 2: To incorporate a SuDS management train during the design stage whereby surface water is managed locally in small sub-catchments rather than being conveyed to and managed in large systems further down the catchment.

- The proposed surface water management plan as mentioned in Section 4 of this report is to split the site into multiple catchment areas for each of the SuDS features located throughout the site. The catchment areas of each SuDS feature can be seen in drawing "20189-LDE-07-00-DR-SC-1C01e".

GI4 Objective 3: To require multifunctional open space provision within new developments to include provision for ecology and sustainable water management.

- One of the proposed SuDS measures is a swale. This area is also intended to function as play areas and places of interest in accordance with GI4 Objective 3. This SuDS features will act to improve ecology and promote sustainable water management by attracting wildlife and serving as a habitat while also accommodating flood waters on site during flood events.

GI4 Objective 4: To require that all SuDS measures are completed to a taking in charge standard.

- All proposed Suds measures have been designed to meet SDCC taking in charge standard where applicable.

GI4 Objective 5: To promote SuDS features as part of the greening of urban and rural streets to restrict or delay runoff from streets entering the storm drainage network.

- Proposed SuDS features for the development include tree pits, permeable paving, raingardens, and a detention basin. These measures will restrict and delay the flow of surface water runoff entering the existing surface water drainage network.

GI4 Objective 6: To maintain and enhance existing surface water drainage systems in the County and promote and facilitate the development of Sustainable Urban Drainage Systems (SUDS), including integrated constructed wetlands, at a local, district and County level, to control surface water outfall and protect water quality.

- The surface water strategy for the proposed development has been designed considering the existing surface water drainage systems. The proposed surface water design incorporates several SuDS features that will improve surface water run-off quality within the site. Runoff rate from the site will be restricted to greenfield run-off rates as per GDSDS.

7.2 SDCC Chapter 11 – Infrastructure and Environmental Services

Policy IE2 of the SDCC Development Plan specifies the objectives for Water Supply and Wastewater. The Policy sets out to *"ensure that water supply and wastewater infrastructure is sufficient to meet the growing needs of the population and to support growth in jobs over the lifetime of the Development Plan facilitating environmental protection and sustainable growth."*

IE2 Objective 1: To work in conjunction with Irish Water to protect existing water and drainage infrastructure and to promote the ongoing upgrade and expansion of water supply and wastewater services to meet the future need of the County and Region.

- A confirmation of feasibility letter has been received from Irish Water confirming that the existing drainage network can accommodate the foul water flows and water demand required from the proposed development subject to upgrade works being carried out. The foul water and watermain network have been designed to adhere to the Irish Water Code of Practice.

IE2 Objective 3: To promote and support the implementation of the Greater Dublin Strategic
Drainage Study, Dublin Region Local Authorities (2005) GDSDS.

- The proposed surface water strategy has been designed in accordance with the guidelines set out by the GDSDS.

IE2 Objective 5: To prohibit the connection of surface water outflows to the foul drainage network where separation systems are available.

- The proposed surface water drainage network is separate to the proposed foul water network throughout the development.

IE2 Objective 9: To ensure that all new developments in areas served by a public foul sewerage network connect to the public sewerage system.

- The proposed foul water network is designed in accordance with the Irish Water Code of Practice and will connect to the public foul sewerage network that is under the responsibility of Irish Water. A Confirmation of Feasibility letter received from Irish Water is within Appendix B of this report. The letter states that the connection to the existing network is viable subject to upgrade works.

IE2 Objective 10: To require all development proposals to provide a separate foul and surface water drainage system – where practicable.

- The proposed surface water drainage network is separate to the proposed foul water network throughout the development.

Policy IE3 sets out to "*manage surface water and protect and enhance ground and surface water quality to meet the requirements of the EU water framework directive.*"

IE3 Objective 2: To maintain and enhance existing surface water drainage systems in the County and to require Sustainable Drainage Systems (SuDS) in new development in accordance with objectives set out in section 4.2.2 of this Plan including, where feasible, integrated constructed wetlands, at a local, district and County level, to control surface water outfall and protect water quality.

- The surface water drainage strategy outlined in this report, the SSFRA and the relevant drawings, proposed the extensive use of SuDS throughout the development to control surface water outfall and protect water quality.

Policy IE4 sets out to *"ensure the continued incorporation of Flood Risk Management into the spatial planning of the County, to meet the requirements of the EU Floods Directive and the EU Water Framework Directive and to promote a climate resilient County."*

IE4 Objective 1: To require site specific flood risk assessments to be undertaken for all new developments within the County in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009) and the requirements of DECLG Circular P12 / 2014 and the EU Floods Directive and Chapter 12: *Implementation and Monitoring* and the policies and objectives of this chapter.

- A site-specific flood risk assessment for the proposed development has been prepared in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009) and the requirements of DECLG Circular P12 / 2014 and the EU Floods Directive and Chapter 12: *Implementation and Monitoring* and the policies and objectives of this chapter.

8.0 LRD Opinion Response

This chapter has been included in response to the Stage 2 LRD opinion report and the associated comments and further information requests made concerning the drainage scope of works. Brief responses have been provided below to summarize the nature of the engineering amendments, with relevant extracts taken from the planning officer's report where appropriate.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 a) SUDs Design details. Note. Sedum roofs are not preferable to the Planning Authority in the interest of biodiversity.

L&D Response:
Refer to drawings No. "20189-LDE-07-00-DR-SC-3C04a-d" for full proposed SuDS details. Also refer to drawing "20189-LDE-07-00-DR-SC-1C01a" and "20189-LDE-07-00-DR-SC-1C01e" for the location of each of these SuDS features and their relevant catchment areas. Reading all these drawings and referring back to Section 4.0 of this report will give a fully detailed explanation as to how each SuDS feature works and designed.

To address the comment on sedum roofs not being preferable, it is proposed to provide a biodiverse green/blue roof. The biodiverse roof system will use a variety of native wildflowers that provide shelter and food for butterflies, bees, and habitats for birds, animals, and invertebrates., which will help bring nature back to urban spaces. An intensive roof, garden, perennials, grasses, shrubs, and small multi-stem tree planting will also be provided to help enhance the biodiversity throughout the site.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 b) Flow route analysis for site.

L&D Response:
Refer to drawing No. "20189-LDE-07-00-DR-SC-1C01f" for the flow route analysis plan of the site. This drawing shows how the location of each SuDS measure, when considering the sites topography, maximizes the above ground natural attenuation for the site.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 c) Comprehensive surface water conveyance plan for the site.

L&D Response:
A flow route analysis for the site has been carried out which is demonstrated in drawing No. "20189-LDE-07-00-DR-SC-1C01f", this drawing when read in conjunction with drawing No. "20189-LDE-07-00-DR-SC-1C01a", which shows the proposed surface water sewer network for the site, demonstrates the surface water management and flow direction of all surface water generated on site. Also refer to drawings "20189-LDE-07-00-DR-SC-3C04a-d" for full SuDS sections and details. These drawings demonstrate how each SuDS feature will work and how it will store surface water to help reduce flood risk of the site.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 d) Drawing showing how much surface water is attenuated in m^3.

i) Underground attenuation should be omitted.

L&D Response:

Refer to drawing No. "20189-LDE-07-00-DR-SC-1C01e" which shows the catchment area and location of each SuDS measure on site. This drawing also contains a table which shows how much surface water will be attenuated by each individual SuDS measure, along with the surface area and depth of said SuDS feature. This drawing also demonstrates how no underground attenuation tanks have been proposed on-site.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 e) Revised report showing surface water attenuation calculations for proposed development.

L&D Response:

Refer to section 4.0 of this report for the fully revised attenuation calculations for the site. These calculations have been revised for any changes in sizes or catchment areas for any of the proposed SuDS features. An expanded and detailed table of these calculations for each individual SuDS feature can also be found in drawing "20189-LDE-07-00-DR-SC-1C01e".

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 f) If underground tanks present, why these cannot be excluded from the design.

L&D Response:

All underground attenuation tanks have been removed from the proposed development and have been replaced by preferable surface level SuDS features such as tree pits, and rain gardens. Details of these proposed SuDS features have been outlined in Section 4 previously.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 g) SuDs layout identifying the different types of SuDS features.

L&D Response:
Refer to drawing No. "20189-LDE-07-00-DR-SC-1C01a" which provides a detailed site layout identifying the location of all proposed SuDS features. Additionally, drawing "20189-LDE-07-00-DC-1C01e" outlines the different catchment areas associated with each SuDS feature.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 h) Demonstrate adherence to SDCC SuDS guidelines.

L&D Response:
The surface water management for the proposed development has been designed based on the SDCC Sustainable Drainage Explanatory Design & Evaluation Guide 2022. Surface water run-off is managed through the use of SuDS that mimic the drainage processes found in nature where possible in line with the SuDS guidance document. SuDS measures have been designed in accordance with Appendix 1 – SDCC Indicative Details for Taking in Charge. Section 7.0 of this report also describes how each objective of the policy GI4 of the SDCC development plan has been addressed.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 i) *Drawing showing plan and cross-sectional views of all SuDS features.*

L&D Response:
Refer to drawings "20189-LDE-07-00-DR-SC-3C04a-d" for full SuDS sections and details.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

19 j) Attenuation from green/blue roofs if proposed should be demonstrated.

L&D Response:
A blue roof will act as a roof level attenuation tank, omitting the requirement for any in-ground attenuation tanks. It is proposed to provide extensive, pebbled & paved blue roofing systems, covering 100% of the total roof area with the aim of reducing runoff from the site in times of precipitation and remove the atmospherically deposited urban pollutants. In normal rain events, rainwater on the blue roof will be absorbed by the vegetation layer. For heavy or 1 in 100-year storm events, when the vegetation layer is no longer capable of retaining any more water, the water will then be deposited into a 100mm deep "attenuation cell" layer and released into the in-ground surface water sewer at a controlled rate. All blue roof outlets will be fitted with a flow control device, limiting the combined flow of water leaving the roof areas at 4.0 l/s. Refer to Section 4.0 of this report for full storage calculations for the blue roof.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

20) Suds Management Plan.

L&D Response:
Refer to section 4.0 above for a detailed explanation of the SuDs strategy for this development. It goes through each SuDS feature considered for this site, a description of each chosen feature, calculations and, also how the Surace water will outflow from the site into the existing network.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

21) Flood Risk Mapping and Assessment.

L&D Response:
A fully detailed flood risk assessment has been carried out for the proposed development which can be found in report "20189-LDE-ZZ-ZZ-RP-0002". This report goes through each possible source of flooding for the site and if flooding does occur, what depth and where it affects the site. This includes flood mapping for the site and what measures can be implemented to the site in order to reduce flood risk to appropriate levels for the development.

South Dublin County Council have made the following observations/comments regarding SuDS Strategy, in-line with Article 23 of the planning and development regulations (as per Article 16A (7)).

22) Confirmation of feasibility from Uisce Eireann.

L&D Response:
As mentioned in sections 3.0 and 5.0 previously, a confirmation of feasibility has been received from Uisce Eireann which outlines that a connection for both water and wastewater for the site is feasible subject to upgrade works. These upgrade works are