BARRETT MAHONY CONSULTING ENGINEERS CIVIL & STRUCTURAL



OUTLINE CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN

PROPOSED MIXED-USE DEVELOPMENT AT THE FORMER GALLAHER'S SITE, AIRTON ROAD, TALLAGHT, DUBLIN 24

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1.0 INTRODUCTION

Barrett Mahony Consulting Engineers (BMCE) have been commissioned to prepare an Outline Construction Demolition and Waste Management . The 2.79-hectare site is currently occupied by the disused factory/warehouse & associated hardstanding.

The proposed development will consist of 502no. residential apartment units in 6no. multi-storey blocks (A-F). Ground level car parking will be provided as an undercroft to blocks A-C and basement car parking will be provided below blocks E and F. The total number of car parking spaces provided is 202. 3no. retail units are with a combined total area of 482m² will be provided (187m², 161m² and 134m²). A 329m² crèche will be provided under the south eastern of Block C, within the site adjacent to the open space. The site will also include communal facilities, (gym, offices) of 704m². This is not a 'Build-to-Rent' (BTR) scheme

Construction of the development involves the following principal elements:

- Demolition of existing buildings.
- Removal of existing services. Site strip.
- Excavation for new foundations.
- Construction of the new reinforced concrete buildings.
- Mechanical & Electrical installations.
- Cladding. Fit-out works.
- Buried site services installation. Connection to public services.
- Soft and hard landscaping. Roads and footpaths.



Figure 1.1 – Site Location

2.0 PURPOSE OF THE REPORT

This report has been prepared as part of the Planning Application for the Former Gallaher's Site, Airton Road development in Tallaght.

The purpose of the report is to ensure that waste generated during the demolition, construction and operational phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 – 2013 and associated Regulations are applied. The report sets out the methodology to ensure that waste reduction, re-use and recycling are maximised during the construction of the project. The contractor for the project will be asked to develop the report further in line with his/her detailed requirements. This report should be read in conjunction with the Construction Management Plan report for the project.

3.0 SITE TOPOGRAPHY

A detailed topographical survey of the existing site has been prepared by Geodata Surveying Ltd. The site was levelled out in the past to accommodate the factory buildings & hardstanding areas. The site level varies typically from +91.00 approx. near the north west corner of the main building to +88.00 at the south east car park. These levels are summarised in the plan below.



Figure 3.1 - Site Levels

4.0 **GROUND CONDITIONS**

A detailed geotechnical and contamination site investigation has been carried out by IGSL for Barrett Mahony & a report issued.

Summarizing the findings, the typical sequence of stratigraphy is a thin layer of made ground/granular fill less than 1.0m thick typically overlying stiff boulder clay becoming very stiff to hard at depths of 4 to 5 metres below ground level (b.g.l.). Rock was not encountered in exploratory drill holes taken to depths of 15.0m b.g.l. The made ground & soils on site are generally classified as 'Inert'. Refer to the IGSL report for further information.

The water table level is approximately 1.5m to 2.0m b.g.l. The boulder clay is typically impermeable except where local lenses of gravel occur

5.0 PROPOSED DEVELOPMENT

The proposed new construction works will consist of the following principal elements:

- Demolition of existing buildings.
- Removal of existing services. Site strip.
- Excavation for new foundations.
- Construction of the new reinforced concrete buildings.
- Mechanical & Electrical installations.
- Cladding. Fit-out works.
- Buried site services installation. Connection to public services.
- Soft and hard landscaping. Roads and footpaths.

During construction there will be construction waste generated, in addition to demolition waste, such as excavated earth spoil from the hard & soft landscaping, foundation and service trench excavations, hazardous materials in small quantities (paints, oils, diesel etc), timber formwork, excess steel reinforcing bars and over-supply of materials along with packaging such as cardboard, plastic and polystyrene and miscellaneous items such as broken glazing panels or cladding off-cuts

6.0 **DEMOLITION**

The demolition of the existing buildings on site is required as part of the proposed developments. There are 3no. existing "blocks" within the site. The BRE Waste Benchmark Data as of June 2012 provides guidance on the estimates of waste based upon the gross internal area of a building and the type of building (office, warehouse). For the purposes of calculating the approximate waste, block 3 has been subdivided into building 3 and building 4. Figure 6.1 shows the buildings to be demolished highlighted in green. Photos of the buildings are shown on the following pages for reference. In summary the buildings are as follows:

- Photo 1: Building 1. Factory warehouse. North Elevation.
- Photo 2: Building 2. Main Office block. East elevation.
- Photo 3: Building 3. Second Office block. East elevation.
- Photo 4: Building 4. Storage warehouse. East elevation.

All demolition works are to be in accordance with the following guidelines:

- BS 6187:2000 'Code of practice for demolition'
- Health and Safety Executive Guidance Notes GS 29 / 1, 2, 3 & 4.
- S.I. 504 Safety, Health & Welfare at Work (Construction) regulations 2013
- Air Pollution Act 1987
- Environmental Protection Agency Act 1992
- BS 5228:2009 Part 1 'Noise & Vibration Control on Construction & Open Sites'.

NOTE: The demolition contractor is required by law to appoint a competent person, experienced or trained for the operations they are involved in, to supervise and control of work on site.



Figure 6.1 – Aerial View of Site Showing Buildings to be Demolished and Building Footprints



Figure 6.2 – Building 1: Factory Warehouse: North Elevation.



Figure 6.3 – Building 2: East Elevation



Figure 6.4 – Building 3: Second Office: East Elevation.



Figure 6.5 – End of Building 3 &4: Storage Warehouse: East Elevation

7.0 EARTHWORKS

There will be a basement below block E & F of the proposed development, which will make up the bulk of the earthworks. There will also be earthworks associated with the site strip & levelling to suit the new buildings. Building ground floor levels are located close to existing ground levels on the site which minimises excavation works. There will be excavation associated with foundations and trenches for site services.

Item	Made -Ground Excavation Volume (m ³)	Soil Excavation Volume (m ³)	Rock Excavation Volume (m ³)	Total (m³)
Basement*	1,650	13,200	0	14,850
Site Strip**	10,000	2,500	0	12,500
Foundations	1,500	4,000	0	5,500
Buried Services	500	750	0	1,250
Total	13,650	20,450	0	34,100

Table 7.1 – Estimated Excavation Quantities

* Basement area approx. 3300m² and 4.5m deep.

**Assumed 500mm site strip of entire surface area, which is taken to be 80% made ground & 20% topsoil.

Excavated material from the site will be generally disposed of off-site as there will be limited opportunities for re-use. Excavated topsoil, 2,500m³, will be retained in a stockpile for re-use in the landscaping.

The total quantity of material to be disposed of off-site is assumed therefore to be 34,100 less 2,500, which equals 31,600m³ approx. Using 4-axle trucks with an 18.0 tonne capacity (36m³), this equates to approximately 878 truck movements spread over a likely period of four months equating to approx. 10 no. truck movements per day a likely maximum during the site strip.

Excavated material will be disposed off-site to a licensed facility. Please refer to the Outline Construction & Demolition Waste Management Plan report for further information.

7.1 Main Construction Waste Categories

7.1.1 Waste arising from construction

In line with the European Waste Catalogues (issued by the EPA in 2002) these categories are defined as 'Non-Hazardous' and 'Hazardous'

A. Non- Hazardous:

The main non-hazardous waste streams that will be generated by the demolition and construction activities at the site are:

- Non-hazardous stones/ bedrock, topsoil and subsoil and made ground fill, from excavations
- Excess new concrete, brick, tiles and ceramics
- Excess asphalt and tar products
- Excess plasterboard
- Scrap metal
- Cardboard (packaging)
- Plastic (wrapping, packaging)
- Waste wood
- Paper

- Glass
- Damaged materials

B. Hazardous:

The hazardous waste streams may include the following:

- Excavated soils classified as 'Hazardous'
- Batteries
- Oils / fuels from machinery and equipment
- Excess paints
- Materials containing asbestos, mercury, PCBs or other dangerous substances
- Wood preservatives
- Electrical or electronic component

Fuels used during the demolition and construction stages are classified as hazardous. If fuel is stored on site for machinery and construction vehicles, then areas around fuel tanks and draw off points will be bunded. When fuel is correctly contained and bunded, there should not be any significant fuel wastage on site.

7.2 Waste arising from demolitions, excavations & site preparation

An outline of the demolitions on the site are set out in Section 6.0 of this report. The main buildings to be demolished are as follows:

List of buildings currently on site:

- Building 1. Factory Warehouse approx. 6,767m² (GF) + 1,729m² (1st) = 8,496m² GIA.
- Building 2. Office block approx. 595m² (GF) + 472m² (1st) = 1,067m² GIA.
- Building 3. Second office block approx. 164m² per floor (2 storeys).
- Building 4. Storage warehouse approx. 351.8m².
- Total GIA approx. = 10,076.8m²

The BRE Waste Benchmark Data as of June 2012 provides guidance on the demolition waste estimates based on the gross internal floor area of a building and the type of building. Estimated demolition quantities are given below. The contractor should prepare a more detailed estimate on possession of the site.

The office blocks are defined as 'Commercial Offices' buildings. The warehouses are defined as 'Industrial Buildings'. The BRE Document gives the following average waste quantities per 100sqm of gross floor area as follows:

- Industrial Building 12.6 tonnes / 100sqm
- Commercial Offices 23.8 tonnes/ 100sqm

Based on this total tonnage of waste generated by the four buildings referenced in Section 5.0 is as follows:

- Industrial: (8,496m²/100m²) x 12.6 tonnes = 1,071 tonnes
- Commercial: (1,067m²/ 100m²) x 23.8 tonnes = 253 tonnes
- Commercial: (164m²/100m²] x 23.8 tonnes = 39 tonnes
- Industrial: (351.8m² / 100m²) x 12.6 tonnes = 44 tonnes

Total = 1,407 tonnes.

The demolition waste breakdown on a typical construction site, based on the BRE document is typically as follows:

	Waste Types	%	Airton Road Site (Tonnes)
1	Concrete, Bricks, Tiles, Ceramic *	64	849
2	Timber	13	172
3	Slate	8	106
4	Asphalt, Tar and Tar products	6	80
5	Plasterboard	4	53
6	Glass	3	40
7	Metals *	2	27
	Total Waste	100%	1327 Tonnes

Table 7.2 – Typical Breakdown of Demolition Waste based on BRE Waste Bench	mark Data
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*Note: If the warehouse is steel framed instead of concrete then item 7 quantity will rise & item 1 will fall.

Excavated material will be generally disposed of off-site to a licensed facility for land reclamation. Some contaminated soil or fill may be encountered in the excavation. Where the excavated material is found to be contaminated, an appropriate disposal method shall be selected depending on the type of contaminant found. Testing will be carried out in advance of site possession by the contractor to determine the soil classification; i.e. inert, non-hazardous or hazardous.

Material to be removed off-site will be classified in a Waste Classification Report. The classifications are 'Hazardous', 'Non-Hazardous' and 'Inert'. Material of a particular classification is to be disposed of to a landfill or facility licensed to take that class of material. All contracted haulers and disposal facilities used to dispose of excavation waste from the site must be licensed to dispose of this waste as noted, and all licenses/permits must be valid, and conditions adhered too.

7.2.1 Asbestos Survey

An asbestos survey report was produced by Phoenix Environmental Safety Ltd. For the site in May 2019. Below is a summary of the report for each building.

7.2.1.1 Building 1

- Asbestos containing felt was identified on the main roof of the building (5,250 m² approx.).
- Strips of galbestos were identified on the extractor located on the rear of the main flat roof (4 strips x 2 linear meters each approx.).
- Asbestos containing floor tiles and bitumen adhesive were identified in the office areas and intermittently in the warehouse area (1,300 m² approx.).
- Asbestos containing bitumen adhesive was identified in the front toilet block under ceramic tiles and in the small office beside the toilet block (90 m² approx.).
- Compressed asbestos fibre (CAF) gaskets were identified on pipework throughout the building.
- Asbestos insulation board (AIB) fire doors were identified intermittently in the building (5 doors approx.)

- Asbestos cement was identified as a spark arrestor in an electrical box in the mezzanine area. There may be more throughout the building as power was presumed live and all electrics were not inspected fully.
- A roll of asbestos textile was identified at the top of the ladder in the mezzanine level. This may have been used to seal some pieces of plant or ducting in areas throughout the factory.
- Asbestos rope was identified between the sections of the ducting throughout.

7.2.1.2 Building 2

- Asbestos felt was identified under asphalt on the main roof (500 m² approx.).
- Asbestos felt was identified on the roof of the link corridor (20 m² approx.).
- Asbestos containing floor tiles were identified in the office areas on the first floor and ground floor (800 m² approx.).
- Asbestos containing nosing's were identified on the steps of the main stairwell.

7.2.1.3 Buildings 3 & 4

- Galbestos was identified under the metal cladding on the roof of the canteen (180 m² approx.).
- Asbestos containing thermal insulation was identified on pipework between the kitchen and changing rooms (10 linear meters approx.). The thermal insulation was in very poor condition.
- Thermal insulation debris was identified on the floor throughout the kitchen area (125 m² approx. kitchen floor area).
- Asbestos containing floor tiles and adhesive were identified throughout building 3.
- Asbestos cement was identified lining the inside of a fridge in the kitchen area (15 m² approx. floor area).
- Asbestos cement spark arrestors were identified in the main fuse board.

Refer to the asbestos report for this site prepared by Phoenix Environmental Safety Ltd. May 2019 For further information.

8.0 WASTE REDUCTION

Refer to Section 9.0 for types of waste generated. Appropriate measures should be taken to ensure excess waste is not generated during construction, including:

- Re-us of crushed concrete demolition material where possible.
- Use reclaimed materials in the construction works.
- Ordering of materials should be on an as needed basis to prevent over supply to site. Coordination is required with suppliers enabling them to take/buy surplus stock.
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal.
- Ensuring correct sequencing of operations.

9.0 PROPOSED USES FOR WASTE / SURPLUSES GENERATED ON SITE & WASTE MITIGATION MEASURES

9.1 Segregation and Disposal

On site segregation categories should include the following:

• Made ground, topsoil, subsoil, bedrock, contaminated material

- Concrete and masonry waste should be source segregated separately and disposed off-site at
 a facility for the reprocessing and reuse of such waste as aggregate or backfill material. Timber
 and scrap metal shall be collected in receptacles with mixed construction waste materials, for
 subsequent separation and recycling at an off-site facility. Other construction waste materials
 will be collected in receptacles with mixed waste materials, for subsequent separation and
 disposal at an off-site remote facility.
- Hazardous wastes will be identified, removed and kept separate from other waste materials to avoid contamination. An asbestos survey of the site has been prepared.
- All generated waste should be separated into paper/glass/plastic recycling and removed to an off-site recycling facility. Under no circumstances is the burning of waste material permitted.
- Packaging waste will be separated into glass, paper, steel, aluminium, fibreboard, wood and plastic sheeting fractions with arrangements made for it to be collected by a Repak approved waste contractor.

Notes:

- a) Waste material to be re-used where possible on site i.e. crushed concrete as backfill to retaining walls.
- b) All waste leaving the site will be transported by suitable licensed contractors and taken to suitably licensed facilities.
- c) All waste leaving site will be recycled, recovered or reused where possible, with the exception of those waste streams where appropriate facilities are currently not available.

10.0 REMOVAL OF WASTE OFF-SITE

It is anticipated that waste materials will have to be moved off-site as outlined above. It is the contractor's responsibility to either; gain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorizations, for the collection and movement of waste off site. Material will be brought to a facility which currently holds a waste permit. Accordingly, it will be necessary to arrange the following waste authorizations specifically for the project, see Appendix 2 for guidelines:

- Waste Permit.
- Waste Collection Permit (possibly).

10.1 Tracking and Documentation Procedures

All waste will be documented prior to leaving the site. All information will be entered into a waste management system kept on the site.

10.2 Control of Traffic Volume

During the demolition and construction works, the traffic generated by plant removing waste off site will be significant. Due to the volume of routine high traffic volumes on the surrounding road network, the site location is sensitive to HGV traffic causing problems.

To prevent undesirable high volumes of construction traffic during the works, it may be decided to limit the times during which waste can be removed to outside of morning and evening rush hour (7am to 9.30am and 4.30pm to 7pm). Outside of these hours there is generally lower traffic volumes on the surrounding road network.

The contractor will be required to submit a method statement for approval to outline the proposed schedule for removal of materials off site.

11.0 ROLES AND RESPONSIBILITIES FOR DEMOLITION AND CONSTRUCTION WASTE

A Construction and Demolition Waste Manager should be appointed on site to ensure that waste prevention / minimisation and recycling are managed appropriately. Their main tasks should be;

- To implement all items set out in this report effectively and to keep accurate records on the waste generated, and the cost associated with waste generation and management.
- Document each consignment of construction and demolition waste, including;
 - Type of material being transported,
 - Quantity of material,
 - Name and permit number of waste collection contractor,
 - Destination of material and proposed use.
- Document the extent of re-use, salvage, recycling and solid waste disposal

Note: Summary reports are required to be provided on the above, which also include estimates of the quantity of waste that is diverted from landfill.

The Construction and Demolition Waste Manager should have the authority to instruct all site personnel to comply with the Construction and Demolition Waste Management Plan. At the operational level, sub-contractors shall have an appointed person who has the responsibility to ensure operations in the construction waste management plan are carried out on an ongoing basis.

12.0 WASTE AUDITING

The appointed waste manager on site will be responsible for conducting a waste audit on site. The audit will include a review of all the records for the waste generated and transported on or off the site to be undertaken. This will include:

- Reviewing details of materials arriving on site.
- Reviewing the amount, nature and composition waste leaving site.
- Calculate the total cost of waste management.
- All areas, and stages of the project should be reviewed to ensure that obvious opportunities for waste reduction are not overlooked.
- Summary of waste arising should be sent to the environmental authority at the completion of the project.

13.0 TRAINING

Copies of the Construction and Demolition Waste Management Plan should be made available to all personnel on site, and objectives, procedures and responsibilities of the construction and demolition waste management plan should be outlined to all site personnel during their site induction.

Members of staff should be instructed on, waste segregation, and material reuse, and how to comply with the construction and demolition waste management plan. Posters should be displayed on site reinforcing the key messages of the construction and demolition waste management plan.

14.0 ESTIMATED COST OF WASTE MANAGEMENT

The cost of waste management should be estimated by the appointed contractor. This should include:

- The purchase cost of waste materials.
- Handling costs.
- Storage and transportation costs.
- Disposal costs including landfill tax.

It should then be possible to estimate:

- Total waste steel management costs.
- Total waste timber management costs.
- Total waste concrete management costs.
- Total waste soil management costs.
- Total waste masonry management costs.

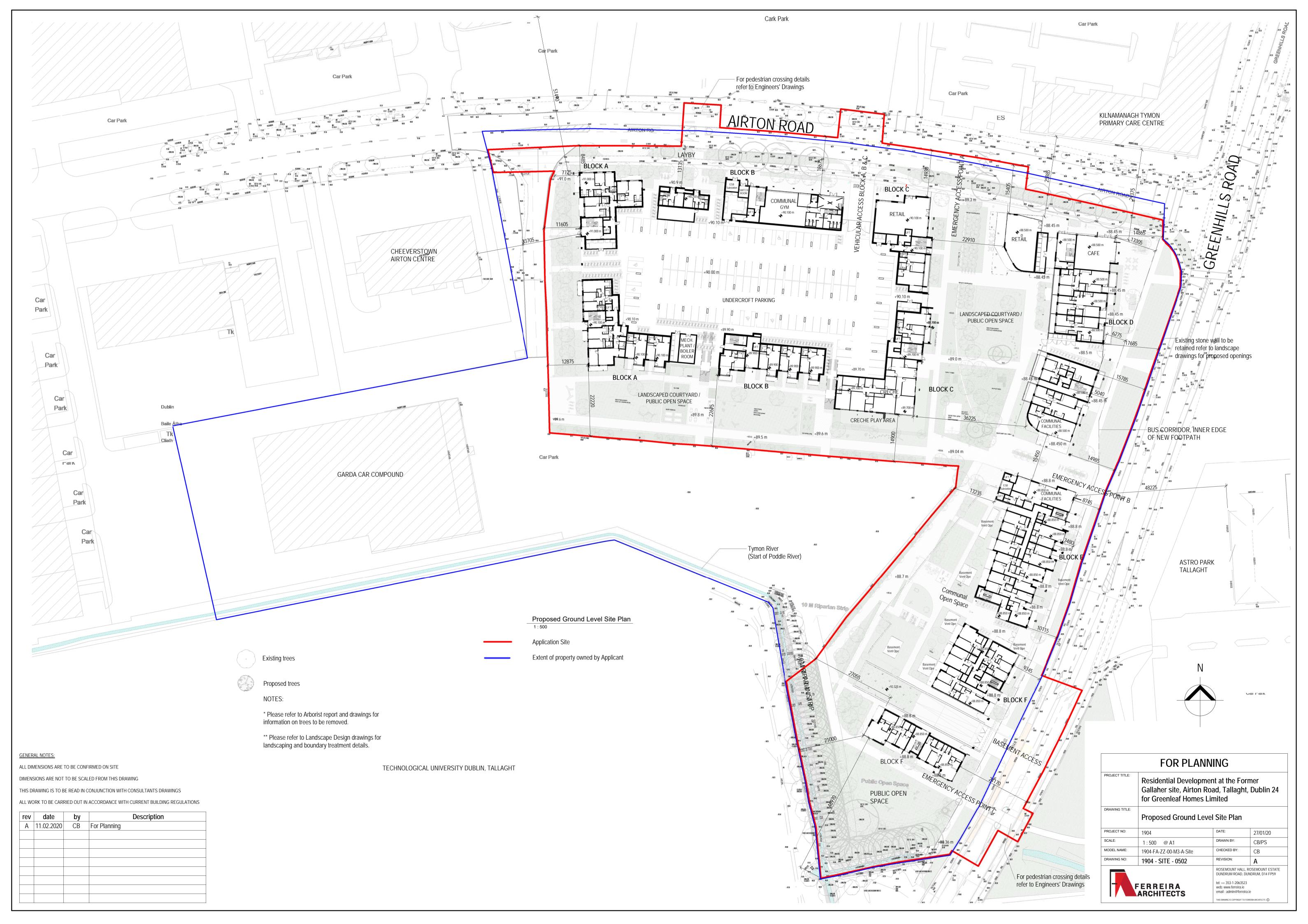
This will help ensure that unproductive and avoidable costs of construction and demolition waste management are eliminated and will be effective in enhancing internal cost control procedures. The estimate of the cost of the waste management should be updated throughout the project at each stage at which a waste audit is carried out.

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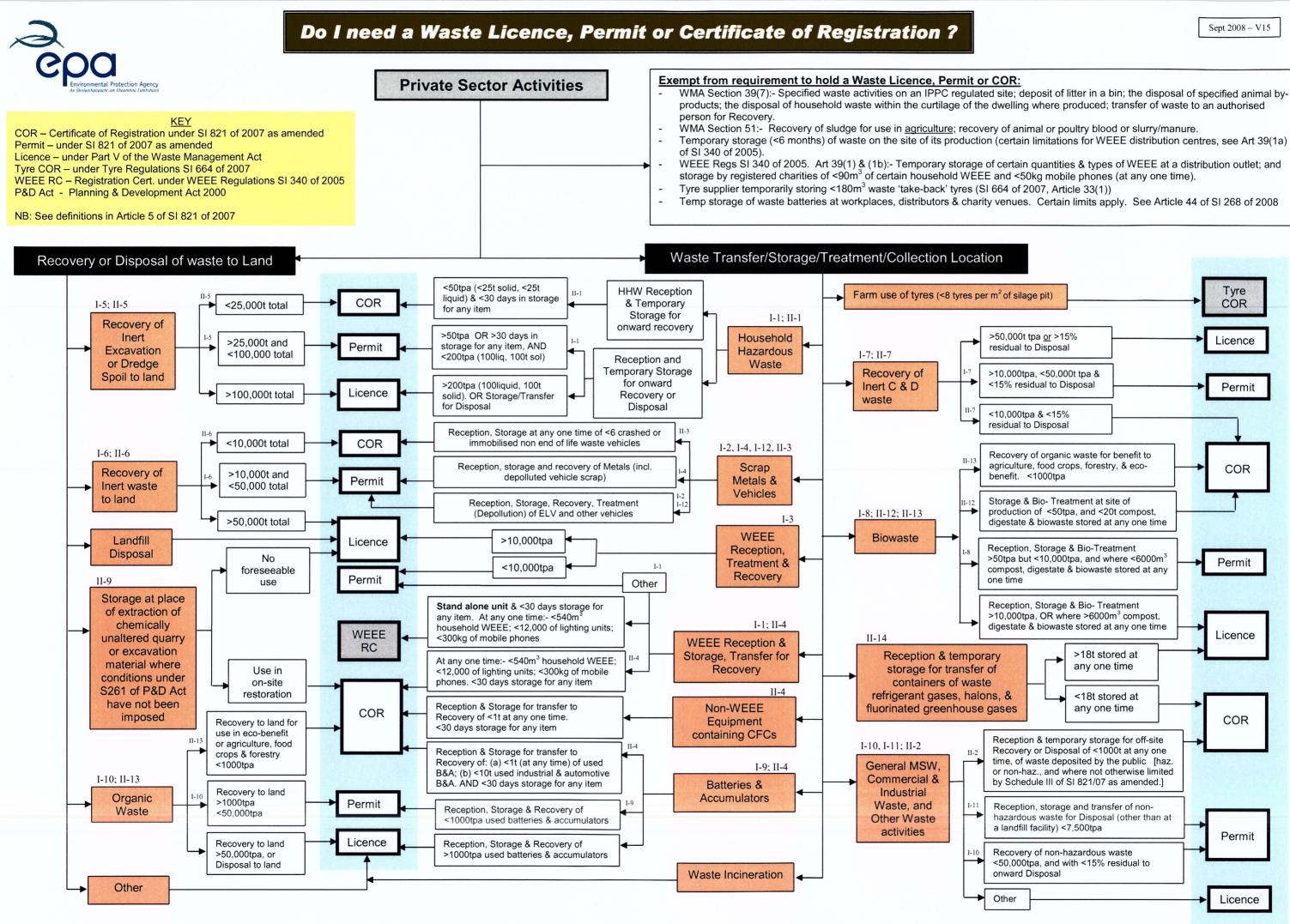
APPENDIX **1** SITE LOCATION



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APPENDIX **2** EPA WASTE GUIDELINES



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