

**CONSTRUCTION & DEMOLITION  
WASTE AND BY-PRODUCT MANAGEMENT PLAN**

**FOR**

**RELATING TO A PROPOSED**

**STRATEGIC HOUSING DEVELOPMENT**

**AT**

**BELMOUNT, NAVAN, CO. MEATH**

**9<sup>th</sup> November 2019**



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## 1.0 INTRODUCTION

This document presents the Construction and Demolition Waste & By-Product Management Plan (CWMP) for the control, management and monitoring of waste associated with a proposed Strategic Housing Development (SHD) at Belmont, Navan, Co. Meath.

The proposal relates to a residential development of 544 no. dwellings on a site of c. 15.1 hectares comprising 260 no. houses (18 no. 2 bed, 207 no. 3 bed & 35 no. 4 bed) and 198 no. apartments (46 no. 1 bed, 152 no 2 bed), 30 no. duplex apartments (15 no. 2 bed & 15 no. 3 bed), and 56 no. dwellings in corner blocks (16 no. 1 bed, 24 no. 2 bed & 16 no. 3 bed) as well as the provision of two crèches (ground floor of apartment building [c. 195 sq. m] and single storey creche in housing area [c. 443 sq. m]) Open Space of c. 2.63 hectares including playground areas; all ancillary landscape works with public lighting, planting and boundary treatments including regrading/re-profiling of site where required as well as provision of cycle paths; Provision of vehicular and pedestrian looped access through the site from 3 no. junctions located on Academy Street as well as pedestrian connection in south east of site to Dublin Road and upgrade works to junction onto the Dublin Road; along with 875 no. car parking spaces and 516 cycle spaces and 4 no. car sharing spaces; Surface water attenuation measures and underground attenuation systems as well as all ancillary site development works (reprofiling of site as required) as well as connection to existing public water supply and drainage services. All site development and landscape works.

The Construction and Demolition Waste Management Plan has been prepared to demonstrate how the Construction Phase will comply with the following relevant legislation and relevant Best Practice Guidelines:

*Waste Management Acts 1996*

*Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)*

*Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)*

*Department of the Environment, Heritage and Local Government – Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects – July 2006*

*The Eastern-Midlands Region Waste Management Plan 2015-2021*

*Meath County Development Plan 2013-2019 - Waste Management*

*EPA “Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019*

The Meath County Development Plan 2013 – 2019 has a Waste Management Strategy, the purpose of which is to promote and facilitate best practice in prevention, re-use, recovery, recycling and disposal of all waste and environmental emissions produced in the County.

It is the policy of Meath County Council, as set out in the Eastern-Midlands Region Waste Management Plan 2015-2021, to:

- *prevent or minimise the production of waste in the first instance;*
- *reduce, re-use and recycle to the maximum extent possible;*
- *endeavor to recover energy from waste where possible; and*
- *ensure the efficient and safe disposal of any residual waste.*

Meath County Council's Waste Management Policies and Objectives relevant to the proposed development are as follows:

*WM POL 7*

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

*WM OBJ 17*

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

The **Objective of this Waste Management Plan** is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The Waste Management Plan shall be implemented throughout the construction phase of the development to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials are segregated into different waste fractions and stored on-site in a managed and dedicated waste storage area.
- To ensure that all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the *Waste Management Act 1996* and all associated Waste Management Regulations.

## 2.0 DEVELOPMENT DESCRIPTION

The subject site is located in Belmont, Navan, Co. Meath on the southern side of Navan town. The south-eastern and southern aspects of the site borders existing residential development. The southwestern, western northern and north-eastern aspects of the site are bordered by existing residential development. The R147 Dublin to Navan Road is located further east of the site and Academy Street is located to the east and northeast of the site. The Springfield Glen road is located to the south of the site which gives access to the existing residential estates located adjacent to the southern, western and northern site boundaries. Lands adjoining the northern site boundary are reserved for future school development.

## 3.0 DESCRIPTION OF SITE ACTIVITIES & WASTE ARISING

The development of the subject site will initially require the the stripping of top and sub soils and the excavation of ground to basement level. The range of works required for the Demolition & Construction Phases are summarised in Table 1. The expected construction and demolition waste that will be generated throughout the course of the development are described in Tables 2 - 4 below.

**Table 1** Sequence of Construction & Demolition Works

Activity Sequence	General Description
Identification of Existing Utility Services	Set up bunting, mark location of live services, including E.S.B., Gas etc.
Removal of Vegetation	e.g. Trees and vegetation
Site Soil Stripping	Excavation and stockpiling of top and sub-soils
Transport of material off site	Segregation of materials on site
Substructure	Rebar, Formwork and Pour
Superstructure	Rebar, Formwork and Pour
Roof	Rebar, Formwork and Pour and Waterproof
External Envelope	Place façade to superstructure
Internal Finishes	Mechanical & Electrical etc.
External Landscaping	Hard and soft landscaping

**Table 2** Typical Construction Waste Composition

Description of Waste	%
Mixed Construction & Demolition Waste	30 - 40
Wood	20 - 30
Plasterboard (Gypsum materials)	10 - 20
Ferrous Metals	5 - 10
Concrete	5 - 10
Mixed other wastes	10 - 20

**Table 3** Predicted Waste Generation

Waste Type	Predicted tonnage to be produced	Re-Use		Recyclable		Disposal	
		Tonnage	%	Tonnage	%	Tonnage	%
Mixed C&D	1250	125	10	1000	80	125	10
Timber	1000	400	40	550	55	50	5
Plasterboard	500	150	30	300	60	50	10
Metals	250	12.5	5	225	90	12.5	5
Concrete	200	60	30	130	65	10	5
Mixed waste	800	160	20	480	60	160	20
Total	4000	907.5		2685		407.5	

**Table 4** Typical Construction Waste Types

Description of Waste	Corresponding LoW Code
Concrete, Bricks, Tiles and Ceramics	17 01
Concrete	17 01 01
Bricks	17 01 02
Tiles and Ceramics	17 01 03
Mixture of concrete, bricks tiles & ceramics	17 01 07
Wood, Glass and Plastic	17 02
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and products	17 03
Bituminous mixtures containing other than those mentioned in 17 03 01	17 03 02
Bituminous Mixtures including Coal Tar and Tarred products	17.03
Metals (including their alloys)	17 04
Copper, Bronze, Brass	17 04 01
Aluminium	17 04 02
Lead	17 04 03
Zinc	17 04 04
Iron and Steel	17 04 05
Tin	17 04 06
Mixed Metals	17 04 07
Insulation and Construction Materials	17 06
Gypsum based construction material	17 08
Other Construction and Demolition Waste	17 09
Mixed Construction and Demolition Waste other than those mentioned in 17 09 01, 17 09 02, 17 09 03	17 09 04
Sewage Screenings	19 08 01
Paper and Cardboard	20 01 01
Wood other than that mentioned in 20 01 37	20.01 38
Soil and Stones	20 02 02
Mixed Municipal Waste	20 03 01
Hydraulic oils	13 01 01*
Fuel oils and diesel	13 07 01*

#### **4.0 PRINCIPALS OF THE DEMOLITION & CONSTRUCTION WASTE MANAGEMENT PLAN**

Waste materials generated by construction and demolition activities will be managed according to the *Department of the Environment, Heritage and Local Government's 2006 Publication - Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*.

The Waste Management Plan specifically addresses the following points:

- Analysis of waste arisings / material surpluses
- Waste Management Responsibilities and Training
- Specific Waste Management
- objectives for the Project including the potential to re-use existing on-site materials for further use in the construction phase.
- Methods proposed for Prevention, Reuse and Recycling
- Waste Handling Procedures
- Waste Storage Procedures
- Waste Disposal Procedures
- Waste Auditing
- Record Keeping

#### **5.0 WASTE MANAGEMENT & RESPONSIBILITIES**

##### **5.1 Roles and Responsibilities**

###### **Construction Project Manager**

The Construction Project Manager will be responsible for the overall implementation of the plan and associated procedure. The Construction Project Manager will ensure that the reporting and recording requirements are met and all necessary resources are in place to support the implementation of the plan.

###### **Nominated C&D Waste Manager/Officer**

A technically competent and appropriately trained C&D Waste Manager / Officer will be appointed by the Project Manager. The nominated person will be responsible for all aspects waste management throughout the different stages of the project including waste assessment and characterisation, implementation of the C&D WMP (and associated target recycling rates), and effective communication of the objectives with all the operatives associated with the project (including site staff, external contractors and suppliers).

A key objective of the nominated person will be the maintenance of accurate records on the quantities of waste / surplus materials generation and management. The recording of summary information will further assist the implementation of the plan.



## Site Personnel

All personnel on site will be responsible for the effective implementation of the plan and associated procedures. All staff will receive training on waste prevention, segregation and best practice guidelines.

## Staff Training

Copies of the C&D WMP will be made available to all relevant personnel on site. The Project Manager will arrange for all site personnel and sub-contractors to be instructed about / receive training on the objectives of the Project C&D waste Management Plan and materials management, and be informed of the responsibilities that fall upon them as a consequence of its provision. The topics to be covered will include;

Project programme and requirements

Health and Safety requirements

C&D WMP

Materials to be segregated

Segregation systems and protocols

Arrangement for the storage and handling of reusable materials and recyclables

Document control requirements

Where source segregation and materials re-use techniques apply, each member of staff will be given instructions on how to comply with the Project C&D Waste Management Plan and will be displayed for the benefit of site staff.

## 6.0 DEMOLITION & CONSTRUCTION WASTE MANAGEMENT & DISPOSAL

- It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.
- Spill kits shall be located within the site compound with clearly labelled instructions on how they shall be used to clean up fuel/oil spills.
- All vehicle and plant oils and liquid construction materials shall be stored in impermeable storage units.
- All diesel-powered generators shall be inspected on at least a weekly basis by a delegate of the project manager to ensure it is not leaking diesel or oils.
- All empty containers containing residual quantities of oils, greases and hydrocarbon-based liquids shall be stored in a dedicated bunded receptacle.
- In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for

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ensuring site housekeeping and the proper segregation of construction waste materials.

- It will be the responsibility of the Construction Project Manager to ensure that a written record of all quantities and natures of wastes exported off-site are maintained on-site in a Waste File at the Project office.
- It is the responsibility of the Project Manager or his/her delegate that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

*Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007)*  
*Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)*

*Waste Management (Facility Permit and Registration) Regulations S.I.821 of 2007 and the Waste Facility Permit under the Waste Management (Facility Permit and Registration) Amendment Regulations S.I.86 of 2008.*

- Typical Waste materials that are to be generated or anticipated to be generated by construction works are classified as follows under *Section 17 Construction and Demolition Wastes* of the European Waste Catalogue (EWC) as detailed in Table 1.
- It is proposed that waste materials will be collected and stored in separate clearly labelled skips in a predefined waste storage area in the site compound and that these materials will be collected by a Permitted Waste Contractor holding an appropriate Waste Collection permit in compliance with *Waste Management (Collection Permit) Regulations 2007 (SI No. 820 of 2007) and Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)* and that they will be sent for disposal or further processing to appropriately Permitted / Licensed Waste Facilities in compliance with *Waste Management (Facility Permit and Registration) Regulations S.I. No. 821 of 2007 and the Waste Management (Facility Permit and Registration) Amendment Regulations S.I. No. 86 of 2008.*
- Prior to the commencement of the Construction Project Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all inert and hazardous wastes arising from the project works. In addition, the Construction / Project Manager shall identify all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.
- All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the *EPA's Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* document dated 1<sup>st</sup> June 2015 to ensure that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

**Figure 1** Waste segregation skips



**Figure 2** Spill Kit



**Figure 3** Bund for waste oil container storage



## 7.0 ON-SITE WASTE REDUCTION REUSE RECYCLING AND MANAGEMENT

Waste will arise on the project mainly from bulk excavation and general construction activities relating to the roads and services. The site management team will order materials and arrange storage in order to minimise the potential for waste on site.

- Materials will be ordered on an “*as needed*” basis to prevent over supply
- Materials shall be correctly stored and handled to minimise the generation of damaged materials
- Materials shall be ordered in appropriate sequence to minimise materials stored on site
- All staff and Sub contractors shall be advised through tool box talks on how to dispose of their waste correctly on-site.
- Concrete blocks, engineering bricks and clay bricks that are surplus will be broken up and used for hardstanding areas.
- Excess wood will be segregated in separate skips and sent for recycling. The site management will police to make sure that the segregation of the wood skip is kept exclusively for wood.
- Plastic arising from general waste or packaging will be segregated and stored in separate skips. Again, the site management team will ensure that there is no contamination of the segregated skips on site.
- Any excess metal generated on site from reinforcement steel and from the demolition element of the project will be kept in the one area and removed off site to a licenced metal recycling facility. The Construction Project Manager will keep certification of this on file on site.
- Top soil that is required for the soft landscaping will be measured and this quantity will be retained on site. The soil that will have to be removed off site will be removed to a licenced landfill facility. The Construction Project Manager will keep records of the removal and the certification on file on site.
- Any hazardous material discovered during the course of the construction shall be reported to the Construction Project Manager. The relevant authorities will be informed and an agreed method for the removal of the hazardous material.
- Construction waste material such as damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material will be processed if necessary, by on-site mobile crushing plant. This initiative shall provide a positive environmental impact to the construction phase as follows:

- Reduction in the requirement for virgin aggregate materials from quarries
- Reduction in energy required to extract, process and transport virgin aggregates
- Reduced HGV movements associated with the delivery of imported aggregates to the site
- Reduced noise levels associated with reduced HGV movements
- Reduction in the amount of landfill space required to accept C&D waste

### **Waste Soils & Stones Export & Article 27 Declarations**

As the subject development site is currently a greenfield site top and subsoils will be characterised as being inert, non-inert or hazardous in accordance with *Landfill Directive (2003/33/EC)* by conducting site investigations. The classification of the soils shall be established by Waste Acceptance Criteria testing.

Excavated rock, soils and stones shall be removed off-site throughout the development and exported by an appropriately permitted haulage contractor to an appropriately permitted/licenced waste acceptance facility.

The Construction Project Manager shall inform Meath County Council of the waste facilities to which inert and hazardous soils and the volumes of which shall be exported to.

Excavated excess soils that are required to be exported off-site shall be tested to determine their classification as hazardous or non-hazardous in accordance with EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Non-Hazardous soils may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011*. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that that a declaration of a material as a by-product is notified to the EPA. The EPA publication *“Guidance on Soil and Stone By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations – Version 3 June 2019* shall be considered in this regard. Appendix I presents the schematic process by which a material is determined as a waste or a by-product.

The records of all WAC tests shall be maintained in the site’s Waste File including the destination of the facility that contaminated soils are exported to and the details of the permitted haulier’s Waste Collection Permit.

It is estimated that c. 41,702m<sup>3</sup> of soils will be excavated to facilitate the development. The volume of fill is estimated to be c.19,614m<sup>3</sup> which will result in c.22,088m<sup>3</sup> being exported off-site.

Landscaping of the development will re-use stockpiled excavated top soils and will utilise up to 10% or c.2088 m<sup>3</sup> of topsoil.

## **Inert Wastes**

The waste material generated by site construction works will be mixed Construction & Demolition waste, comprising of soil and stone, concrete, tiles, ceramics, and bricks. Material may be processed on site if necessary, using an on-site crusher unit, which will process fill material into suitable size classes for the reuse as on-site construction materials. Mixed C&D waste with large non-uniform stone or compacted soils may be passed through a mobile crusher unit which will render the material into a uniform shape and size which will allow for improved backfilling and compaction to required engineering standards.

## **Hazardous Wastes**

The management of all hazardous waste arisings if they occur, shall be coordinated by the Construction Project Manager and the Project Health and Safety Manager.

Hazardous wastes such as waste oils and construction liquids shall be stored in dedicated clearly labelled impermeable containers in the waste compound prior to removal off-site.

## **Contaminated Soil**

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the *2002 Landfill Directive (2003/33/EC)* for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit and that this hazardous material will be sent for appropriate treatment / disposal to an appropriately Permitted / Licenced Waste Facility.

## **Invasive Species**

An invasive species report prepared by Openfield Ecological Services has concluded that there are no invasive plant species on the subject site.

## 8.0 RECORD KEEPING

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

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

- Waste Type EWC Code and description.
- Volume of waste collected.
- Waste collection contractor's Waste Collection Permit Number and collection receipt including vehicle registration number.
- Destination of waste load including Waste Permit / Licence number of facility.
- Description of how waste at facility shall be treated i.e. disposal / recovery / export
- Details of all Article 27 declarations

The waste records shall be issued to Meath County Council as required / requested.

Where practicable, a computerised monitoring tool may be employed. This system will enable the Contractor to measure and record the quantity of waste generated, and identify possible savings on wastage. Thus, each consignment of C&D waste taken from site will be subject to documentation and recording. An indicative template is contained in Figure 4, to ensure that full traceability of materials to its final destination.

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

In addition a record will be kept of all materials as they arrive on site detailing the assignment of specific uses within the works. This will enable the monitoring of the quantity and type of waste produced at various stages throughout the project.

**Figure 4** C&D Waste Tracking Template

Number	Waste Description	EWC	Date of Collection	Time of Collection	Destination	Treatment/Disposal Method	Container Type	Container Size	Registration Number	Weight (ton)	Haulage Company	Estimate of Actual Waste (ton)	Documents Received	Documents on File	Document Reference Number
1	Sample - Sub soil	17 05 04	25/05/2016	10-45am	Landfill at Local Authority Facility	Recycling to Landfill	8 Wheeler Truck	10m3	15 D 12345	20	ABC Hauliers	20	Yes	Yes	ABC 12345
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## **9.0 CONSTRUCTION WASTE MANAGEMENT AUDITING**

The effectiveness of a Waste Management Plan (WMP) and its implementation, will be subject to regular audits by the Construction Project Manager throughout the duration of the project in accordance with the Audit Plan (to be developed during the works).

The regular audits will focus on materials inputs to the project and the waste outputs for each operation identifying additional opportunities for waste reduction, re-use and recycling.

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

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

Inspections of the waste storage areas will be undertaken on a weekly basis, issues relating to housekeeping, inappropriate storage and / or segregation will be actioned at the earliest practicable opportunity.

The Construction Project Manager will record the findings of the audits, including waste types identified, quantities of waste arising, final treatments and cost, in a report to be available to the Local Authority as required during the course of the works.

Details of the inputs of materials to the construction site and the outputs of wastage arising from the project will be investigated and recorded in the Final Waste Audit, which will identify the amount, nature and composition of the waste generated on the site.

The Final Waste Audit will examine the manner in which the waste is produced and will provide a commentary highlighting how management policies and practices may inherently contribute to the production of construction and demolition waste.

The measure waste quantities will be used to qualify the costs of management and disposal in a Waste Audit Report, which will also record lessons learned from these experiences, which can be applied to future projects.

## Appendix I

### Decision tree for determining whether a material is a by-product

