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CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT PLAN FOR PROPOSED CRUISE BERTH AT DUN LAOGHAIRE HARBOUR, CO DUBLIN

Technical Report Prepared For

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1.0 INTRODUCTION

AWN Consulting Ltd (AWN) has prepared the following Construction and Demolition (C&D) Waste Management Plan (WMP) for the development of a proposed Cruise Berth Facility at Dun Laoghaire Harbour, Co Dublin.

The purpose of this C&D WMP is to ensure that waste arisings during the construction and demolition phase will be managed and disposed of in a way that ensures the provisions of the *Waste Management Acts 1996* - 2013 and associated Regulations [1] and the *Waste Management Plan for the Dublin Region 2005 – 2010* [2] are complied with. It will also ensure that optimum levels of waste reduction, re-use and recycling are achieved.

2.0 C&D WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Government issued a Policy Statement in September 1998, known as *Changing Our Ways* [3], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this Strategy 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 (by 2013).

In response to the "*Changing Our Ways*" report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report titled '*Recycling of Construction and Demolition Waste* [4] concerning the development and implementation of a voluntary construction industry programme to meet the governments objectives for the recovery of construction and demolition waste.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced *Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* in July 2006 in conjunction with the Department of the Environment, Heritage and Local Government [5]. There are threshold criteria set out in the Guidelines to determine whether a C&D WMP is required. The proposed development is a substantal construction project and therefore requires a C&D WMP.

The Guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These Guidelines have been followed in the preparation of this document and include the following elements:

- Predicted demolition & construction wastes and procedures to prevent, minimise, recycle and reuse wastes
- Waste disposal/recycling of C&D wastes at the site
- List of sequence of demolition operations to be followed
- Provision of training for waste manager and site crew
- Details of proposed record keeping system
- Details of waste audit procedures and plan
- Details of consultation with relevant bodies, i.e. waste recycling companies, Dun Laoghaire County Council etc

Other guidelines followed in the preparation of this report include the "*Construction and Demolition Waste Management – a handbook for Contractors and Site Managers"* published by FÁS and the Construction Industry Federation (2002) [6].

Comprehensive reports regarding the quantities of C&D waste produced in Ireland have been compiled by the Environmental Protection Agency (EPA). *National Waste (Database) Reports* [7] detailing, among other things, C&D waste generation and the level of recycling, recovery and disposal of this material, provide estimates based on information from waste companies and contractors.

The National Waste (Database) Report in 2011 [7] estimated the total quantity of C&D waste collected in 2011 was approximately 3 million tonnes, a decrease of 13% since 2010. (The National Waste Database for 2012 has recently been published but detailed information on C&D waste generation and recovery rates are not provided in this edition of the report).The quantity of C&D waste has been decreasing steadily in recent years with the slow down in construction projects. The report points out that there are some large uncertainties in relation to the validity of the data reported. There is a large discrepancy between the reported quantities of C&D waste collected and the reported quantity of C&D waste managed/treated i.e. recovered or disposed. While 3 million tonnes of C&D waste was collected, there was a gap of 0.4 million tonnes (21%) for soil and stones and 0.1 million tonnes (7%) for the non soil and stones fraction, resulting in an overall gap of just under 0.5 million tonnes.

2.2 Regional Level

The proposed development is located in the Local Authority area of Dun Laoghaire Rathdown County Council.

The Dublin Region first produced a Waste Management Plan in 1999, which encompasses the Local Authorities of Dublin City Council, South Dublin County Council, Dun Laoghaire Rathdown County Council and Fingal County Council. The Plan was revised for the period 2005 – 2010 and is awaiting a review in early 2015.

One of the primary objectives of the existing Plan is to achieve more sustainable waste management practices in the C&D sector. The treatment/recycling rates for C&D waste adopted by the Dublin Region are currently around 83% (2011). This requires the following actions.

- The development company must employ best practice at the design, planning and construction stage to ensure waste prevention and recycling opportunities are identified and implemented.
- Waste Collectors are required to source separate recyclables and introduce graduated charges to incentivise better site practices.
- Local Authorities will ensure the voluntary industry code is applied to development control, to regulate the collection and treatment of waste to meet the Plan objectives, and also work to develop markets for recycled materials.

2.3 Legislative Requirements

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* 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.) 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 collection and transport of waste).

Waste contractors are typically engaged to transport waste off-site. Each contractor must comply with the provisions of the *Waste Management Act 1996* and associated Regulations. This includes the requirement that a contactor handle, transport and 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 the relevant 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 waste permit granted by the local authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* [1] as amended or a waste licence granted by the EPA. For marine disposal, a Dumping at Sea permit is required. The permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled and/or disposed of at the specified site.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

The new berth is to be located in the centre of the harbour directly south of the existing harbour mouth. The existing harbour is enclosed within a western pier and eastern pier. Within the harbour there are two breakwaters. These breakwaters shelter the inner waters of the harbour. There are a variety of landuses on the landside of the Harbour i.e. along Harbour Road, Dun Laoghaire. These include the existing Stena HSS ferry facility (serving the Dun Laoghaire to Holyhead route), Irish Lights buildings and the Dun Laoghaire Marina (berthing of yachts and other small vessels) and associated recreational facilities.

The new quay structure will extend approximately 450m northwards from a point just west of the Hobbler Memorial on the eastern marina breakwater. The berth will consist of a 120m long by 20m wide concrete quay supported on tubular steel piles, located 180m north of the breakwater, this quay will be connected to the eastern marina breakwater by an approximately 9.1m wide concrete access causeway also supported on tubular steel piles. Ships will berth along the eastern side of the quay.

In order to cater for cruise ships up to 340m in length, sufficient water needs to be provided at the berth and in a navigation channel from the berth seaward. A depth of 10.5m below Chart Datum is required to provide safe navigation for vessels. The proposed navigation channel for large cruise ships will be 120m wide and will approach from the harbour entrance from deep water to the east, to a turning circle, 550m in diameter and centred approximately 300m north of the harbour entrance. The creation of the channel will require the dredging of a minimum of 710,000m^3 of sediment comprising sand and silt from the seabed. Initial testing has indicated that the material is relatively uncontaminated and should be suitable for disposal at the existing spoil disposal grounds at Burford Banks. Any disposal of dredged materials will be subject to granting of a Dumping at Sea Permit by the EPA.

A Schedule of Areas has been prepared by the project design team (including Waterman Moylan) and this design information has been used in assessing the waste requirements for the proposed development.

3.2 Details of the Wastes to be Produced

3.2.1 Construction Phase

The proposed development entails a significant level of construction but significantly from a waste perspective, most of this construction occurs in the marine environment. The vast majority of the waste generated will be marine sediments which will be disposed to a marine dumping at sea facility subject to EPA permission. Approximately 710,000m^3 of dredging spoil will be generated during the construction of the navigation channel for the cruise berth.

On shore, construction of the supporting facilities to the berth will generate typical surpluses of construction wastes such as concrete, masonry, electrical wiring, piping etc. Waste from packaging and oversupply of new materials will also be generated. It is not anticipated that significant quantities of topsoil, subsoil and bedrock (if encountered) will be generated during remodelling resurfacing of the landside facilities.

The construction compound and related ancillary infrastructure will be located in the south western portion of the site for the duration of the works. A waste storage area (WSA) will be provided at the construction compound.

3.2.1 Demolition Phase

By comparison with the "construction" aspect of the project, relatively modest quantities of waste will be produced from the demolition of a small number of existing buildings, walls and structures at the Harbour though it is noted that these wastes will be somewhat more difficult to segregate than the waste generation from the construction phase, as many of the materials have been bonded together and integrated, i.e. steel reinforcements in concrete floors/walls etc.

It is noted that no known asbestos containing materials have been identified in the structures to be demolished. In the event that any suspect asbestos containing material is identified prior to or during demolition works, licensed asbestos specialists will be required to assess and undertake the removal of these wastes, in accordance with best practice and the relevant health and safety legislation, prior to demolition. A schedule of proposed demolition items is set out on Table 3.1 below.

Table 3.1 Demolition: Schedule of Areas

Description	Area Sq M	Type	Comment
Shared Use Access Route	1,370	Road Reconstruction	Concrete and Block Pavement, drainage Signs, Gates, Lighting posts, buried utilities +services
Harbour Road	1,955	Road + Footpath Remodelling	Kerbing + Road Surfacing, gullies + drainage, signs and lines, utilities, services, landscaping and tree felling.
Boundary Wall	Included above	Security Wall	RC and buried foundations
Accommodation Road	200	Retaining Wall Realignment	Masonry wall, road pavement, kerbs and gullies, lines, signs
Porte Cochere Structures	312	Stressed Skin Canopies (2)	Steel frame, stretched skin fabric, tensioned strands and RC foundations, metal gates etc
Motorists Admin Building	20	Building	Building Structure, Services, Finishes, Buried utilities and services

3.3 Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that will be generated by the construction and demolition activities at a typical site are shown in Table 3.1. The European Waste Code (EWC) for each waste stream is also shown.

Table 4.1: Waste types and EWC

Waste Material	EWC
Non-Hazardous	
Concrete, bricks, tiles, ceramics	17 01
Wood, glass and plastic	17 02
Bituminous mixtures, coal tar and tarred products	17 03
Metals (including their alloys)	17 04
Soil, stones and dredging spoil	17 05
Gypsum-based construction material	17 08
Hazardous	
Electrical and Electronic Components	16 02
Batteries	16 06
Wood Preservatives	03 02
Liquid Fuels	13 07
Soil and stones containing dangerous substances	17 05 03
Other construction and demolition wastes containing dangerous substances	17 09 03
Paints, Inks, Resins and Adhesives containing dangerous substances	20 01 27*

3.4 Anticipated Hazardous Waste Arising

There will be fuel stored on the site for use in construction machinery and equipment. As fuel is classed as a hazardous material, all fuel storage tanks and draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to, and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel wastage at the site.

Paints, glues and other known hazardous substances will be stored in designated areas during construction. They will generally be present in small volumes only.

4.0 ESTIMATED WASTE ARISINGS

The EPA has produced figures for the C&D waste recorded in the *National Waste Database* [8]. This includes a percentage breakdown of waste showing the percentage of each waste type in the C&D stream.

The US EPA has also produced figures for the characterisation of building-related C&D waste [11]. Figures for the C&D waste generated per m^2 in the building industry, for mixed use developments from this study have been used as a waste range per m^2 for this site.

Table 4.3 shows the estimated C&D waste generation for the proposed development for the main waste streams based on the information available. The predicted waste amounts are primarily based on an average medium scale development waste generation rate per m^2. Where specific data has been made available by the consulting engineers this data has also been incorporated.

Table 4.2: Construction and Demolition Waste Generated on a Typical Irish Construction Site

Waste Types	**%**
Glass	3
Concrete, Bricks, Tiles, Ceramics	64
Plasterboard	4
Asphalt, Tar and Tar products	6
Metals	2
Slate	8
Timber	13
Total Waste	**100**

4.1 Demolition Waste Generation

Based on the structures proposed to be demolished and their respective floor areas; Porte Cochere (tented canopy), buildings (312m^2) and the motorists admin building (20m^2) and the above industry standards (Table 4.1), the amount of demolition waste predicted to be generated for the proposed development has been calculated.

The demolition of the Porte Cochere and motorist's admin building will not generate significant quantities of waste. They are relatively small structures. Though the Porte Cochere represents 312m^2 in areal extent, it is a light steel frame and tension membrane construction with a limited number of enclosure booths so will generate limited amounts of waste compared with a standard building of the same size (the bulk of the waste from the Porte Cochere will be the steel frame structure from the canopy).

Table 4.3 show the predicted demolition waste that will be generated and indicative targets for the management of this waste on the site.

Table 4.3 Predicted Demolition wastes

	Total Waste	Reuse/Recover		Recycle		Disposal	
Waste Types	**tonnes**	**%**	**tonnes**	**%**	**tonnes**	**%**	**tonnes**
Glass	1.1	0	0	85	0.935	15	0.165
Concrete, Bricks, Tiles, Ceramics	22.1	85	18.785	5	1.105	10	2.21
Plasterboard	1.4	0	0	0	0	100	1.4
Asphalt, Tar and Tar products	2.1	0	0	25	0.525	75	1.575
Metals	0.7	5	0.035	80	0.56	15	0.105
Slate	2.8	0	0.0	85	2.38	15	0.42
Timber	4.5	10	0.45	40	1.8	50	2.25
Total	34.7	-	19.27	-	7.305	-	8.125

Actual demolition waste production figures will be calculated by the appointed contractors prior to work commencing based on detailed assessments of the building by survey, including material types, wall thickness, building heights and depth of foundations.

4.2 Construction Waste Generation

Table 4.4 shows the predicted construction waste generation for the proposed development based on the information available to date. Note that until final materials and methods of construction have been decided it is not possible to predict with a high level of accuracy the construction waste that will be generated. Table 4.5 shows targets for the management of construction waste at the site.

Table 4.4: Predicted Construction Waste Amounts

Waste Types	Waste (m3)
Marine Dredging Spoil	710,000
Concrete	1,094
Road Materials (Asphalt, Tar and Tar products)	1,078
Total	**712,172**

Table 4.5: Predicted Construction Waste Targets for the Proposed Development

	Waste	Reuse		Recycle		Disposal	
Waste Types	**m3**	**%**	**m3**	**%**	**m3**	**%**	**m3**
Marine Dredging Spoil	710,000	0	0	0	0	100	710,000
Concrete	1,094	20	218.8	75	820.5	5	54.7
Road Materials	1,078	0	0	25	269.5	75	808.5
Total (average)	**712,172**	**(6)**	**218.8**	**(33)**	**1,090**	**(60)**	**710,863**

4.3 Proposed Waste Management Options

Marine dredging spoil will be collected by dredging vessels and transferred directly to the DaS site for disposal (subject to a successful application for EPA permission). Landside wastes will be segregated on site by construction staff and stored in a WSA next to the Construction Compound. See Figure 4.1 for an indicative representation of the WSA.

The C&D WSA will have skips and receptacles for all recyclable wastes. The appointed waste contractor will collect and transfer the recyclable wastes as receptacles are filled. The non-recyclable waste streams will be transferred to landfill. Numerous waste contractors in the Dublin Region carry out this operation.

Bedrock, Blocks and Concrete
It is anticipated that the majority of the landside C&D waste will be clean, inert material and it is proposed to reuse it for construction purposes where possible. The material will either be crushed onsite and used for infill during construction, or be removed from the site by licensed contractors under the *Waste Management (Collection Permit) Regulations 2007* [1] and recovered off-site.

Soil/Subsoil
Limited quantities of topsoil and subsoil will be generated to facilitate construction of the cruise berth. Any excess soils and subsoils arising will be disposed of or re-used offsite subject to permitting and licensing/testing requirements of the receiving facility.

If any soil/subsoil is deemed to be contaminated it will be stored separately to the inert soil/subsoil, sampled and tested. The material will be appropriately classified as non-hazardous or hazardous in accordance with Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills, before being transported to an appropriately licensed facility by permitted contractors.

Plastic
As plastic is now a highly recyclable material, much of the plastic generated during construction will be diverted from landfill and recycled. The plastic will be segregated at source and kept as clean as possible and stored in a dedicated covered skip.

Timber
There will be limited timber waste generated from the construction work Timber waste typically arises as off-cuts or damaged pieces of timber or from the demolished buildings.

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc, will all be recycled. It will be collected on site in a designated area, and collected by a timber recycling company, or a recycling company that will pass it on to a timber recycling company. Such companies shred the timber and use it for manufacture of wood products or for landscaping (wood chips etc).

Scrap Metal
Steel is a highly recyclable material and there are numerous companies that will accept waste steel and other scrap metals. A segregated skip will be available for steel storage on site pending recycling.

Cardboard Packaging
Cardboard packaging can also be recycled. Cardboard should be flattened and placed in a covered skip, to prevent it getting wet.

Plasterboard
Waste gypsum can be recycled into new plasterboard. A skip will be provided for waste plasterboard and collected as necessary.

Hazardous Wastes
On-site storage of any hazardous wastes produced (i.e. any potential contaminated soil, tarmac, asbestos containing material, waste fuel, paints or other residues) will be minimised, with off-site removal 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.

Non-Recyclable Waste
There will be a general skip or receptacle for C&D waste not suitable for re-use or recovery. This skip will include general wet waste (mixed food waste and food packaging), polystyrene, contaminated cardboard, contaminated plastic etc. Workers on the site will be encouraged to recycle as much municipal waste as possible, i.e. cardboard, plastic, metals and glass.

Prior to removal, the non-recyclable waste receptacle will be examined by either the foreperson or a member of his/her team to determine if recyclable materials have been placed in there. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly.

4.4 Tracking and documentation procedures for off-site waste

All waste loads will be documented prior to leaving the site and a weight obtained where possible. Waste will be weighed on an onsite weighbridge if available and also independently by the contractor (either by weighing mechanism on the truck or at the receiving facility). These records will be kept on site (both hard and soft copies).

All movement of waste and the use of waste contractors will be undertaken in accordance with the relevant provisions of the *Waste Management Acts as amended*, and the *Waste Management (Collection Permit) Regulations 2007*. This includes the requirement for all waste contractors to have a waste collection permit, issued by the NCWPO. The Waste Manager (see Section 8.0) will maintain a copy of all waste collection permits.

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

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

5.0 DEMOLITION PROCEDURES

The following sequence of works should be followed during the demolition activities:

5.1 Check for Hazards

Prior to commencing works, structures to be demolished will be checked for any likely hazards including asbestos containing materials, electric power lines or cables, gas reticulation systems, telecommunications, unsafe structures, and fire and explosion hazards, e.g. combustible dust.

In the unlikely event asbestos containing materials are encountered during construction, workers will temporarily stop working near the materials and a survey/assessment will be carried out by a suitably qualified person. In carrying out the survey the following will be undertaken:

- Identification of the type of asbestos or materials containing asbestos;
- Identification of the condition of the asbestos or materials containing asbestos;
- Assessment of the risk created by that exposure to the health of those employees and of the steps that need to be taken to prevent or minimise the exposure and to comply with the requirements of *The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 (*as amended 2010);
- A written risk assessment and management plan will be prepared in accordance with *The Safety, Health and Welfare at Work (Construction) Regulations, 2006* (as amended 2010) and *The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006* (as amended 2010).

If the asbestos material is identified as asbestos cement and it is determined that the action level will not be exceeded during the course of the work activity, then the contractor may draw up a management plan and proceed on that basis to perform the work activity. If, however, the asbestos is identified as any other type of material containing asbestos the management plan and the related work activity must be performed by a specialist asbestos contractor.

5.2 Removal of Components

All components that can be salvaged will be removed first. This will primarily include steel metal however will also include structural timbers, appliances, galvanised piping, wiring and metal ducting etc.

5.3 Demolition

The breakdown of internal walls will be carried out in the intact buildings once all salvageable or reusable materials have removed.

6.0 ESTIMATED COST OF WASTE MANAGEMENT

The cost of waste management is difficult to estimate at this stage of the development for a number of reasons:

Firstly until contractors are appointed for the development and definite choices made in terms of materials to be used, methods of construction, suppliers, etc, the budget for waste management services and operations on the site cannot be determined.

Despite this, an outline of current prices for different aspects of waste management and relevant costs of landfill and recycling are provided below. This provides an indicative cost for individual aspects of waste management on C&D sites.

The total cost of C&D waste management will be measured and will take account of the purchase cost of materials (including imported soil), handling costs, storage costs, transportation costs, revenue from sales, disposal costs etc.

6.1 Reuse

By reusing materials on site, there will be a reduction in transport and disposal costs for a waste contractor taking the material away to landfill.

If crushed concrete, masonry, soils, etc. cannot be reused on site, they may be reused as capping material for landfill sites, or for the reinstatement of quarries etc. This material may be taken free of charge for such purposes, reducing final waste disposal costs.

6.2 Recycling

In the Dublin region, cardboard and clean plastic would cost around €200 per tonne for disposal as municipal waste (includes the landfill levy of €75 per tonne) but can be recovered for a fraction of that cost if recycled.

Salvageable metals can usually be deposited free of charge at a metal salvage yard and so should only incur collection costs by a contractor permitted to collect metals.

Timber can be recycled as chipboard if not reused on site. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

Plasterboard, which under the *Council Directive 1999/31/EC* [12] is not permitted to be taken at landfills (classified as not being an inert substance) can now be recycled. This derivation from landfill will again help reduce costs of waste management on the site.

6.3 Disposal Costs

Landfill charges in the Dublin region are currently at around €200/tonne (including the landfill levy). In addition to disposal costs, waste contractors may also charge a collection (or tipping) fee for compactors skips and bins. This varies depending on the scale of the development and the type of receptacle.

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.

7.0 TRAINING PROVISIONS FOR WASTE MANAGER AND SITE CREW

A waste manager will be appointed to ensure commitment, operational efficiency and accountability during the C&D phase. This can be the foreman or one of the construction team.

7.1 Waste Manager Training and Responsibilities

The waste manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid him/her in the organisation, operation and recording of the waste management system implemented on site.

The waste manager 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 waste manager to delegate responsibility to sub-contractors where necessary and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and salvage.

The waste manager 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.

He/she will be 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 know how to implement the C&D WMP.

7.2 Site Crew Waste Management Training

Training of site crew is the responsibility of the waste manager and as such a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs (e.g. general site induction, safety-training, etc).

This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

8.0 RECORD KEEPING

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

The waste manager or delegate will record the following

1. Waste taken for reuse off-site
2. Waste taken for recycling
3. Waste taken for disposal
4. Reclaimed waste materials brought on-site for reuse

For each movement of waste on- or off-site, a signed docket will be obtained by the waste manager from the contractor, detailing the weight and type of the material and the source and destination of the material.

This will be carried out for each material type. This system will also be linked with the delivery records. In this way, the percentage of C&D waste generated for each material can be determined.

The system will allow the comparison of these figures with the targets established for the recovery, reuse and recycling of C&D waste and to highlight the successes or failures against these targets.

9.0 OUTLINE WASTE AUDIT PROCEDURE

9.1 Responsibility for Waste Audit

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

9.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported on or off-site should be undertaken mid-way through the C&D phase. If waste movements are not accounted for, the reasons for this should 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.

Waste management costs will also be reviewed.

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.

10.0 CONSULTATION WITH RELEVANT BODIES

10.1 Local Authority

Dun Laoghaire Rathdown County Council will be consulted as required throughout the C&D phase in order to ensure that all available waste reduction, re-use and recycling opportunities are identified and utilised and that compliant waste management is carried out.

10.2 Recycling/Salvage Companies

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. If used, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and/or licences are held. In addition, information regarding individual C&D materials will be obtained, including the feasibility of recycling each material, the costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off site.

REFERENCES

1. Waste Management Act 1996 (S.I. No. 10 of 1996) as amended by the Waste Management (Amendment) Act 2001.

    - Waste Management (Facility Permit and Registration) Regulations, S.I No. 821 of 2007 as amended 2008 (S.I No. 86 of 2008).
    - Waste Management (Collection Permit) Regulations S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008).
    - Waste Management (Packaging) Regulations 2003 (S.I. No. 61 of 2003)
    - Waste Management (Licensing) Regulations 2000 (S.I 185 of 2000) as amended 2002 (S.I 336 of 2002)
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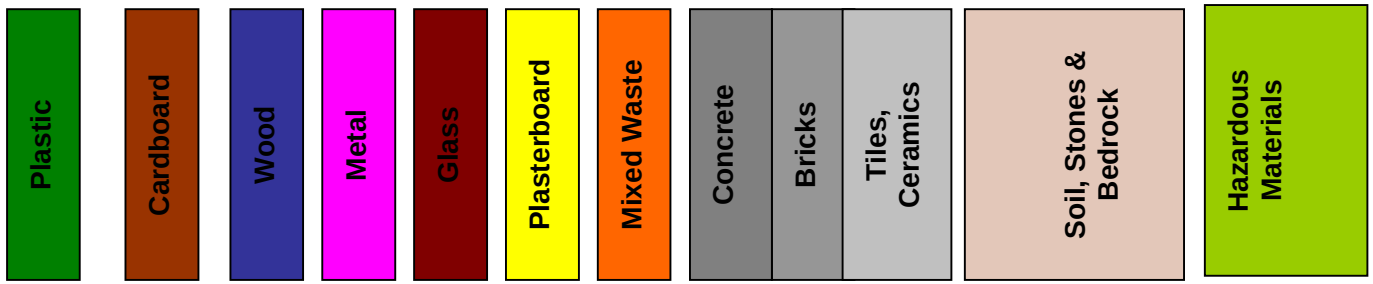
FIGURE 4.1
SKETCH OF C&D WASTE STORAGE AREA



Access for Collection Vehicles

Project

C&D WMP, Proposed Cruise Berth facility at DLHC

Reference

14/7009WR02

Figure 4.1

Indicative C&D Waste Storage Area Layout.

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