

Proposed Residential Development at St. Ann's Road, Blarney, Co. Cork

CONSTRUCTION, ENVIRONMENTAL & WASTE MANAGEMENT PLAN – FOR PLANNING

Prepared for: HRP Construction
Prepared by: MMOS Consulting Engineers
Date: 10.03.2026
Job Number: 23141
Reference: 23141-MMS-ZZ-ZZ-RP-C-0002



MMOS Consulting Civil & Structural Engineers,
The Chapel, Blackrock House, Blackrock Road, Cork, T12 KRK7.
T 00353 (0)21 4317608 mmosengineers.com

REVISION CONTROL TABLE

Document reference: 23141-MMS-XX-XX-RP-C-0002

Revision	Date	Issue	Author	Checked
00	13.10.2025	Issued for Planning	SL	PM
01	15.10.2025	Issued for Planning	SL	PM
02	12.12.2025	Issued for Planning	SL	PM
03	06.02.2026	Issued for Planning	SL	PM
04	09.03.2026	Issued for Planning	SL	PM

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1. INTRODUCTION

MMOS Consulting Engineers were requested to undertake this report on behalf of HRP Construction (the Applicant) as part of a Part 8 planning application to Cork City Council for a residential development at St. Ann's Road, Blarney, County Cork. The Applicant is applying for planning permission for the construction of 138 residential units, a civic centre, and all ancillary works.

This report is prepared at planning stage, it is envisaged that a construction stage plan will be undertaken by the main contractor when appointed. This document will form the basis for the construction stage document which will be an everyday reference guide for site personnel to avoid, reduce, and/or compensate for the impacts of project work.

This construction management plan is to be read in conjunction with all planning drawings and relevant architect's drawings.

1.1. SCOPE OF REPORT

This CMP will firstly examine the existing site and proposed development at this location followed by then examining general construction management practices. This report includes a proposed Construction Traffic Management Plan (CTMP), a Construction Waste Management Plan (CWMP), and a Construction Environmental Management Plan (CEMP).

The CEMP is to include measures for controlling pollutants and dealing with surface water runoff during the construction works. It will also outline the details relating to sustainable and environmental measures to be implemented on site to prevent adverse impacts on the surrounding environment. Accordingly, this CWMP identifies the main objectives for the managed procedures which are required to ensure the construction and demolition related activities on the subject site are executed in a safe and controlled manner, and to minimise disruption and impacts on the amenities in the area.

The Noise, Dust, and Vibration monitoring outlined in this document are to ensure the construction environment is monitored and managed to minimise any impact to the development's neighbours.

1.2. SITE LOCATION

The site for the proposed development is located on the site of the former Blarney Park Hotel in Blarney Town, north of Blarney Castle and Gardens. It is bounded by agricultural land to the west, wooded land and a local drain to the south, St. Ann's Road to the northeast, and a car park for Blarney Castle & Gardens to the east as shown in Figure 1. The overall site area is approximately 3.70 ha. Currently, the site is overgrown, with several hard-standing areas present.



Figure 1 – Site Aerial View

1.3. PROPOSED WORKS

This report accompanies the planning application for the construction of 138 residential units, a civic centre, and all ancillary works.

Please refer to the architects' drawings attached to this application for full site details and block elevations.

2. HEALTH & SAFETY

Prior to the commencement on site, the contractor is to submit a site specific health and safety method statement for the project.

It is envisaged that the contractor will act as Project Supervisor Construction Stage (PSCS). A Project Supervisor for the Design Process (PSDP) will be appointed by the client. MMOS Engineers are the Project Engineers. All temporary works design will need to be submitted to MMOS so that they can be co-ordinated to the PSDP.

The following works are required to be undertaken prior to the commencement of construction works:

1. All documentation relating to Health and Safety to be submitted to PSDP for approval.
2. The identification of existing services on site and their diversion/protection/removal.
3. The provision of hoarding, site access, security, and welfare facilities.

3. CONSTRUCTION & TRAFFIC MANAGEMENT

3.1. CONSTRUCTION DETAILS

The main objective of the overall Construction Management Plan is to minimise the impact of the construction process on the receiving environment and ensure all associated construction/demolition waste is minimised, reused, recycled, and removed to an authorised waste facility as appropriate. Included below are the main elements and tasks involved in the construction of the site and the management processes.

Main tasks to be completed on site include:

- Site compound setup.
- Construction of vehicular access to site.
- To secure the construction site.
- Erection of internal and external site signage.
- Erection of surface water management control measures.
- Demolition of all existing structures on site
- Removal, recycling, and disposal of demolition waste to approved facilities.
- Decommissioning and removal of all mechanical and electrical service installations.
- Isolate, and cap as necessary, all mains and incoming services including electricity, gas, water, telecoms, foul, surface water, and water.
- Protection of all adjacent buildings during site works. The contractor is to employ methods that will not cause damage or disruption to public areas of neighbouring developments.
- The Contractor shall arrange a full asbestos survey prior to any work commencing on site to be undertaken by an independent consultant and shall fully comply with the requirements of the Health & Safety Authority and Cork City Council in all respects related to the demolition and disposal of any asbestos from the site.
- Site clearance, including the removal of any existing scrub/vegetation and paved surface that is not proposed to be retained as part of the development.
- Excavation to formation level of site plots and the storage of any suitable excavated material for reuse on site e.g. landscaping.

- Removal of unsuitable fill material to a licenced land fill.
- Construction of proposed residential units.
- Provision of services and utilities including a surface water attenuation tank, surface water sewer connection, foul sewer connection, and watermain connection etc.
- Construction of internal cycle/pedestrian pathway.

3.2. CONSTRUCTION METHODOLOGY & SEQUENCING

The following is a proposed potential sequence of construction.

- Clear site of vegetation
- Remove any hardstanding/concrete plinths.
- Isolate, and cap as necessary, all mains and incoming services including electricity, gas, water, telecoms, foul, surface water, and water.
- Protection of all adjacent buildings during site works. The contractor is to employ methods that will not cause damage or disruption to public areas of neighbouring developments.
- Demolition of the existing buildings & structures on site.
- Removal, recycling, and disposal of demolition waste to approved facilities.
- Excavate to formation level of site plots.
- Install appropriate foundations.
- Install site services.
- Cast ground floor slab.
- Construct masonry rising walls and walls.
- Construct brick and glazed facades.
- Install plant and equipment.
- Complete external services.
- Complete construction of roads

- Complete the construction of vehicular & pedestrian pathway.

3.3. EXISTING SERVICES

The existing Uisce Éireann services record maps indicate a 7" Asbestos Uisce Éireann owned water pipe running along a section of St. Ann's Road immediately north east of the proposed development as shown in Figure 2. Within this map, further watermain supplies have been identified which serve premises in the vicinity of the proposed development.

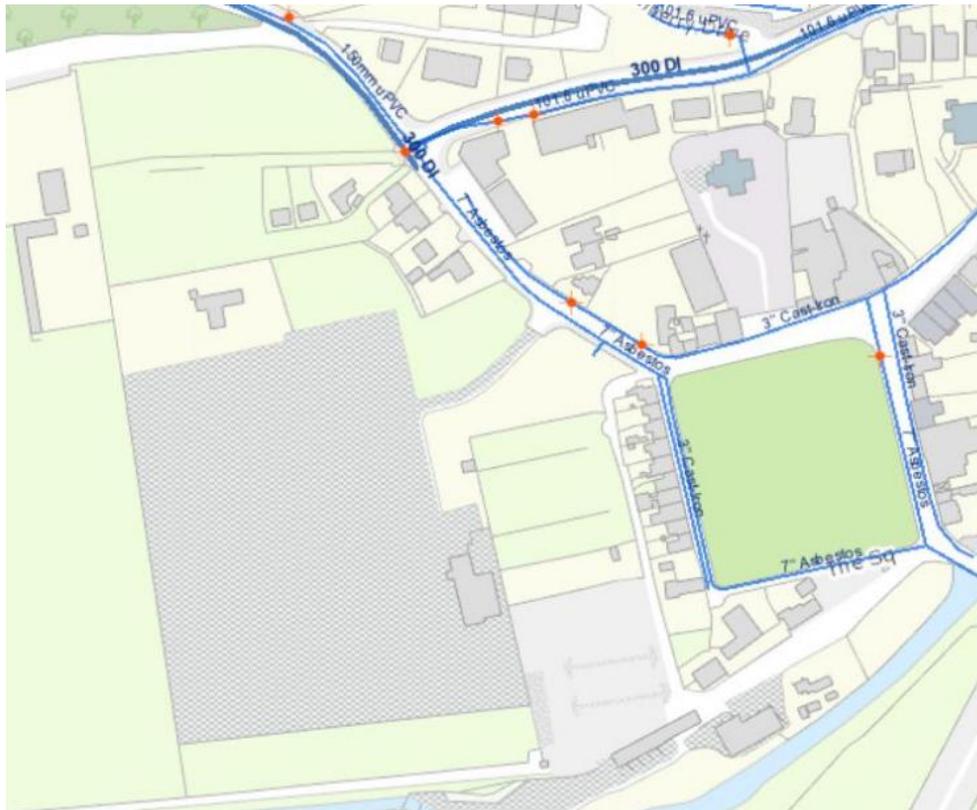


Figure 2 - Watermain record map (Uisce Éireann)

The existing Uisce Éireann services record map for the wastewater sewer network indicates a 225mm & 300mm diameter sewer pipe of unknown material type running through the site, and an unknown diameter sewer pipe of clay material type along a section of St. Ann's Road as shown in Figure 3.

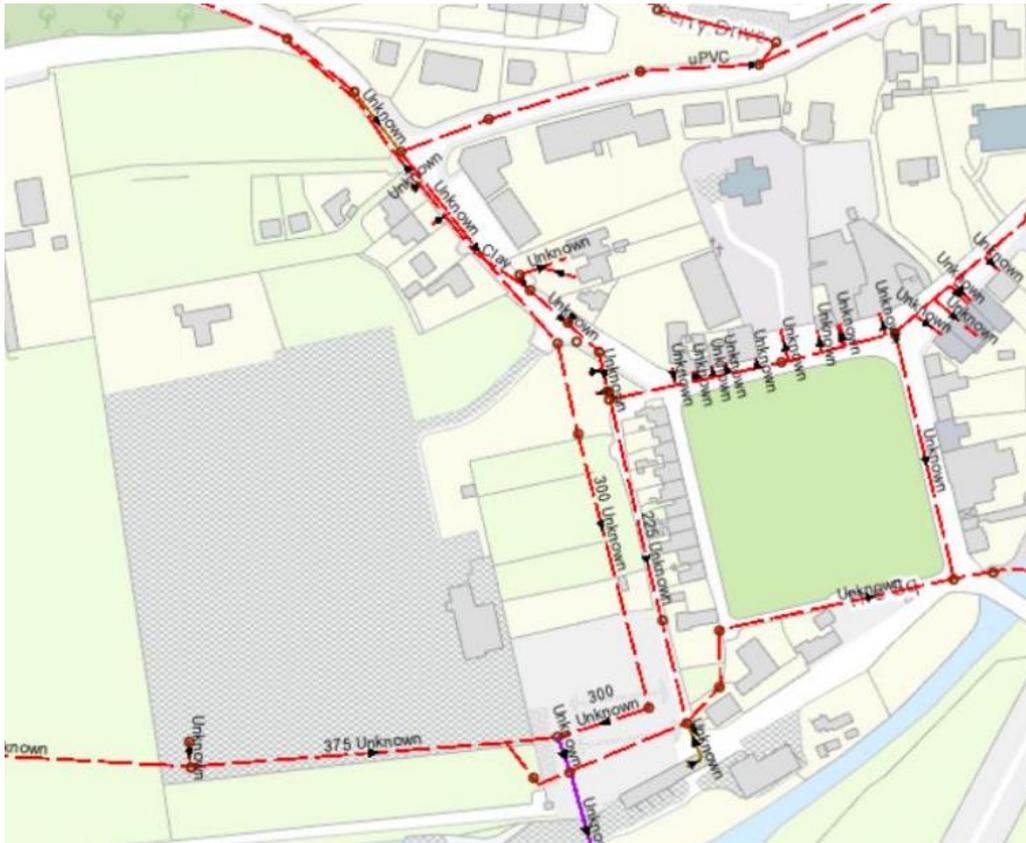


Figure 3 – Wastewater record map (Uisce Éireann)

This information is to be used for informative purposes only, the Main Contractor will be required to verify each service during the enabling works and to terminate as required. The Contractor shall carry out a detailed site survey so as to determine the full extent and exact locations of services within the construction area.

The Contractor shall protect drains, manholes, gullies, vent pipes and fitting still in use and ensure that they are kept free from debris and contaminants at all times. The Contractor is to make good any damage arising from any works and leave them clean and in working order at completion.

The Contractor and all persons performing work shall comply with all safety rules and regulations and shall take all necessary precautions to assure safe working conditions during the works. The Contractor shall use all necessary surveying equipment to locate underground

cables and carry out necessary precautions as required when digging around existing live cables, watermains, or gas mains.

3.4. HOURS OF WORK

To moderate impacts on the surrounding area and in order to mitigate noise levels emanating from the site, all site development and building works will be carried out only between the hours of 08.00 to 18.00 Mondays to Fridays inclusive. Any deviation from these times will be shall require the prior approval of the CCC Housing Directorate.

3.5. SITE ACCESS & PARKING

During the delivery of construction activities, it is proposed that site traffic will access the site via St Anns Road. As these roads are also used to access residential houses, access / egress to the site will need to be carefully coordinated and managed. This will need to be carefully outlined by the contractor in the Construction Stage plan.

It is proposed that onsite parking facilities for contractors working on the development will be initially provided within the existing car park on site. This access point and parking may be adjusted following the demolition of the existing structure which will be outlined and developed by the contractor at a later stage prior to the commencement of construction or demolition activities on site.

3.6. PEDESTRIAN ACCESS

Authorised pedestrian access to the site is proposed to be provided from the eastern boundary near the site access point with appropriate segregation from the vehicular access points. This access point may be adjusted following the demolition of the existing structures which will be outlined and developed by the contractor at a later stage prior to the commencement of construction or demolition activities on site.

3.7. MAIN GATE & PEDESTRIAN GATE

Due to the nature and location of the site, the main gate will remain closed at all times. The foreman will have a key and a spare will be located at the site reception. The gate will be opened for deliveries, and it will be closed again once unloaded. If the gate is to remain open for prolonged periods, such as large concrete pours, a flag man will be placed at the gate for the duration it remains open to ensure there is no unauthorised entry.

Initially, all pedestrian access will be via the pedestrian entrance to the northern side of the site. This door will remain closed at all times and will only be opened by the input of a security pin code. This code will be given to staff at inductions.

3.8. PLANT SEGREGATION

Any works completed outside the site boundary will be fully barriered with such work covered by a method statement and agreed in advance with the local authority. All plant driving on the public roads will be accompanied by a vehicle banksman. For works outside the boundary which may impede the traffic/pedestrians on the public road, a separate traffic management plan will be completed.

Within the site boundary, a clear pedestrian access will be provided to the areas of work and appropriate signage placed. Pedestrian boundaries will be clearly delineated with appropriate pedestrian barriers.

Both within the site boundary, and on the public road, all plant will give way to pedestrians and will be carefully controlled by operatives and site banksman.

3.9. SITE SECURITY

The site shall be kept secure at all times and in accordance with the Health and Safety Authority Regulations, appropriate signage will be placed, indicating that it is a construction site and the associated hazards clearly presented.

As discussed, if the site access gate is to remain open for prolonged periods, such as large concrete pours, a flag man will be placed at the gate for the duration it remains open to ensure there is no unauthorised entry.

The pedestrian access gate will remain closed at all times, and it will only be opened by the input of a security pin code.

The Contractor shall provide all necessary security during the progress of the works and shall be responsible for any damage or injury arising from insufficient security.

3.10. SIGNAGE

In accordance with the Health and Safety Authority Regulations, appropriate signage will be placed, indicating that it is a construction site and the associated hazards clearly presented. This signage will be erected in advance to warn other pedestrian and road users of a construction site ahead. These signs will be checked and cleaned regularly so that they are maintained in a good working order.

As appropriate and in accordance with legislation, within the construction site, signage shall be placed indicating the hazards present, site rules, emergency vehicle routes, assembly points, and means of escape.

3.11. SITE COMPOUND & FENCING

As part of the development programme, it is proposed that the construction compound and staging area will be mainly located centrally within the proposed development. It is noted that the location and operation of the site compound will be co-ordinated by the main contractor with details provided prior to commencement.

3.12. CLEANING OF ROADS

The roads will be monitored throughout the works and a road sweeper will be employed as required, should the roads become dirty. The contractor will liaise with the local authority and all adjoining owners/residents in respect of the timing and movement of the road sweeper and associated activity.

All truck drivers must also inspect their vehicles before they leave the site for stones caught in their tyres or any other debris.

3.13. WORK ON PUBLIC ROADS

Any works on public roads outside the site will be co-ordinated with Cork City Council and the adjoining businesses. Secure site hoarding will be employed around any works outside of the site, with dedicated controlled access points.

All fire exit points for adjoining buildings will be kept active at all times.

4. NOISE, DUST, & VIBRATION

4.1. NOISE

The Contractor will be required to carry out noise monitoring at a defined location on the boundary on an ongoing basis during the works. The contractor must ensure that construction noise will comply with the requirements of *BS5228-1:2009: Code of Practice for Noise and Vibration Control on Construction and Open sites*. Noise during construction shall not exceed 65dB (A), Leq 30 minutes, and the peak noise shall not exceed 75 dB (A) when measured at any point off site.

The contractor is to have a point of contact available during the works at all times and if exceedances are recorded, the contractor will be required to adopt alternative construction methodologies and measures to ensure that the limits are complied with.

Noise monitoring will be addressed with the contractor on an ongoing basis by the Engineer, and it will be on the agenda at weekly site meetings.

4.2. DUST

The Contractor will be required to carry out dusting monitoring at three defined locations on the boundary on an ongoing basis during the works.

The Contractor will be required to prepare and implement a dust minimisation plan for the duration of the works. Dust control will take on board the recommendations as outline in "*Control of Dust from Construction and Demolition Activities*" – (BRE/DTI, 2003). The dust limit is set as 350mg/m²/day as outlined in the TA Luft Guidelines. The dust minimisation plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of dust minimisation through the use of best practice and procedures. At all times, the procedures put in place will be strictly monitored and assessed.

The contractor is to have a point of contact available during the works at all times and in the event of dust nuisance occurring outside the site boundary, significant dust producing activities will be immediately terminated and satisfactory procedures implemented to rectify the problem prior to the resumption of operations.

In order to ensure that no dust nuisance occurs, a series of measures will be implemented as follows:

- Site access shall be regularly cleaned and maintained as appropriate.
- Hard surface areas shall be swept to remove mud and aggregate materials from their surface, while any un-surfaced areas shall be restricted to essential site traffic only.
- Any area that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles on site shall have their speed restricted, and this speed restriction must be enforced rigidly.
- Vehicles delivering or removing material with dust potential, shall be enclosed, or covered with tarpaulin at all times to restrict the escape of dust.
- All vehicles exiting the site shall make use of the wheel wash facility prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads.
- Public roads outside the site shall be regularly inspected for cleanliness and cleaned, as necessary.
- The roads will be monitored throughout the works and a road sweeper will be employed by the contractor as required, should the roads become dirty.
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind.

- Water misting, or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

Dust monitoring will be addressed with the Contractor on an ongoing basis by the Engineer and it will be on the agenda at weekly meetings.

4.3. VIBRATION

The Contractor will be obliged to carry out vibration monitoring at two defined locations on the boundary on an ongoing basis.

The works will be required to comply with *BS5228 (2009): Code of practice for noise and vibration control on construction and open sites- Part 2: Vibration*. BS5228 recommends that that, for soundly constructed residential property, light commercial buildings, and similar structures that are in good repair, a threshold for minor or cosmetic (i.e., non-structural) damage should be taken as a peak particle velocity of 15mm/s at 4 Hz increasing to 20mm/s at 15 Hz and increasing to 50 mm/s at 40 Hz and above for intermittent vibration.

Below these vibration magnitudes, minor damage is unlikely, although where there is existing damage, these limits may be reduced by up to 50%.

The Contractor is to have a point of contact available during the works at all times whereby if exceedances are recorded, the Contractor will be required to adopt alternative construction methodologies and measures to ensure that the limits are complied with.

5. WASTE MANAGEMENT PLAN

5.1. CONSTRUCTION STAGE

5.1.1. General

The contractor will be required to prepare a site-specific Demolition Waste Management Plan & Construction Waste Management Plan for the site and submit it prior to commencement of the works. This is to include an *Estimated Construction & Demolition Surpluses/Deficits* and the proposed sequencing of demolition works.

Details of the Wastes to Be Produced (Incl. Estimated C&D Surpluses/Deficit

During the demolition and construction phases of the proposed development, there will be waste generated, such as mixed demolition waste, off-cuts of timber, oversupply of materials, damaged or broken concrete blocks and tiles, along with packaging materials such as cardboard, plastic, and polystyrene.

Main C&D Waste Categories

The main non-hazardous waste streams that will be generated by the construction and demolition (C&D) activities at the site include:

- Stones/bedrock, topsoil, and subsoil
- Concrete, brick, tiles, and ceramics
- Asphalt, tar, and tar products
- Plasterboard
- Scrap Metal
- Cardboard (packaging)
- Plastic (wrapping, packaging)
- Waste wood
- Paper

Hazardous waste streams on site may include the following:

- Batteries
- Wood Preservatives
- Oils/Fuels from machinery & equipment
- Asbestos

The European Waste Code (EWC) Classification for each waste stream is presented in Table 1.

Table 1 – Waste types and EWC Classification

Waste Material	EWC Code
<u>Non-Hazardous</u>	
Concrete bricks, tiles, and ceramics	17 01 00
Wood	17 02 01
Glass	17 02 02
Plastic	17 02 03
Bituminous mixtures, coal tar and tarred products	17 03 00
Metals (including their alloys)	17 04 00
Soil, stones, and dredging spoil	17 05 00
Insulation materials and asbestos-containing materials	17 06 00
Gypsum-based construction material	17 08 00
Other construction and demolition waste	17 09 00
Cardboard	15 01 01
<u>Hazardous</u>	
Asbestos	17 06 05
Batteries	16 06
Wood Preservatives	03 02
Liquid Fuels	13 07

Estimated Waste Arising & Proposals for Reduce, Reuse & Recycle

The Environment Protection Agency (EPA) has produced figures for the C&D waste recorded in the National Waste Database. This includes a percentage breakdown of each waste type in the C&D stream.

Table 2 – Breakdown of Waste Materials generated at a typical site

Waste Types	%
Bedrock, Soil & Stones	51
Concrete, Bricks, Tiles, Ceramics, Plasterboard	39
Asphalt, Tar and Tar products	2
Metals	2
Other	6
Total Waste	100

As Table 2 indicates, for a typical site, a significant percentage of the waste typically generated will be soil and stones. Any suitable excavated material from the site will be reused on site if possible. In the event of the material being used off site, options include land remediation/infill on other sites in the area. The possibility of material reuse at nearby sites is to be investigated in accordance with Article 27 and EPA guidelines.

Proposed Uses of Wastes and Surpluses/Deficits from the Site

A temporary segregation bay will be constructed at the site for the duration of the construction and demolition phase of the development. The bay will include segregated areas for recyclable waste streams, such as gypsum (plasterboard), cardboard, timber, and concrete/blocks/tiles etc.

Cardboard:

Cardboard will be segregated on site. The cardboard will be flattened and placed in a covered skip or tied and covered, to prevent the card getting wet. A recycling contractor will collect it as required.

Plasterboard:

There will be a separate skip for plasterboard at the site. There are a number of specialist contractors that recycle plasterboard, and they will be contracted to address this matter.

Reprocessed gypsum powder, which makes up to 94% of the plasterboard, can be reprocessed into new plasterboard or converted for use in soil conditioners for the agricultural industry. The paper, which makes up to 6% of the plasterboard, can be reused in various industries.

Soil/Subsoil:

Excess excavated soil will be disposed of off-site. Soil will be removed and disposed of by contractors licenced under the *Waste Management Act of 1996*, the *Waste Management (Permit) Regulations of 1998*, and the *Waste Management (Collection Permit) Regulations of 2001*. This material will be used for fill material on other sites, or capping purposes on site, e.g. at a landfill.

Plastic:

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

Timber:

There will be timber waste generated from the construction work as off-cuts or damaged pieces of timber. Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc, will all be recycled. It will be stored on site in a designated skip and collected by a recycling contractor. 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.

Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Any contractor who takes waste materials from the site will be compliant with the *Waste Management Act of 1996 & 2001* and also the *Waste Management (Collection Permit) Regulations of 2001*, i.e. any contractor removing waste from the site will have a waste collection permit issued by Cork City Council (CCC). The foreman on the site will have a copy of the waste collection permits.

All information will be entered in a waste management system kept on the site; this will be maintained by the appointed building contractor. This will maintain accurate records on the quantities of waste/surpluses arising and the real cost (including purchase) associated with waste generation and management, locations for disposal and recycling of waste and the permitted contractors used in the process.

Disposal of C&D Waste

There will be a general skip or receptacle for C&D waste not suitable for reuse or recovery. This skip will include polystyrene, contaminated cardboard, and plastic etc. Workers on the site will be encouraged to recycle as much municipal waste as possible, i.e. cardboard, plastic, metals, and glass. General wet waste will be presented separately for recovery. Food waste will be segregated with separate receptacles for collection and disposal.

Raw and uncured concrete waste and waste products are to be disposed off-site at an appropriate location. Machinery and hand-tool washing is not to be undertaken in nearby watercourses, any washings materials is to be appropriately managed and disposed of off-site.

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

5.1.2. C&D Waste Management Procedures

Sorting/Segregation Arrangements for Individual Materials

All C&D waste materials is to be stored separately on site, i.e., there will be a Central Waste Storage Area (CWSA) with specific receptacles or bays for each material taken from the construction phase.

Bins or skips used on site will be transportable to the CWSA. A forklift will be used to transport skips and containers around the site. By segregating wastes at source, it can be arranged that a waste contractor/recycler will collect the materials as necessary.

Details of Transportation and Reception Arrangements for Movement of Materials to Other Sites

The waste materials will be stored in the specifically designated compound. All waste collected from the site will be by a permitted waste contractor, under the *Waste Management (Collection Permit) Regulations 2001*.

The contractor will provide the waste manager on site with documentation of the waste to be removed and a copy of the waste collection permit. Prior to the waste leaving the site, the waste manager will have documentation to show where the waste is being taken to, and that the facility is licenced to accept the particular waste. A receipt will be issued for each load that leaves the site.

Some wastes may be transported to another site for reuse on the site. The manager will be in contact with other sites to ensure that as much waste is reused as possible, such as concrete for fill purposes etc.

All wastes leaving the site will be placed in appropriate containers. Any concrete, soil, gravel, or broken stone transported off-site will be covered to prevent dust or particle emissions from the load.

Training Provisions for Waste Manager and Site Crew

One of the construction team, or the foreman, will be appointed as a waste manager to ensure commitment, operational efficiency, and accountability.

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 on the site.

The waste manager will have an 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 on site.

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 the waste management on site.

He/she will be also 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 construction waste management plan.

The training of the site crew is the responsibility of the waste manager. A waste training program will be organised. A basic awareness course will be held for all site crew to outline the C&D waste management plan, and to detail the segregation of waste materials at source. This may be incorporated into the induction course, or the safety-training course.

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.

Disposal of hazardous and toxic materials if found, should be carried out by the demolition contractor utilising specialists licenced to carry out such works and should be fully in accordance with all statutory requirements and in accordance with the requirements of the Local Authority, Health and Safety Authority, and the Environmental Protection Agency.

All personnel involved with the project will receive an on-site induction relating to operations and will have the responsibility to:

- Work to agreed plans, methods, and procedures to eliminate and minimise environmental impacts.
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact.
- Respond appropriately in the event of an incident to avoid or limit environmental impact.
- Report all incidents immediately to their line manager.
- Monitor the workplace for potential environmental risks and alert the immediate line manager if any are observed.
- Co-operate with site inspections as required.

5.1.3. 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 arising on site.

The waste manager, or a member of his team will record the following:

- Waste taken for reuse off-site (i.e. for capping of landfill cells or at another site).
- Waste taken for recycling.
- Waste taken for disposal.
- Reclaimed waste materials brought on-site for reuse.

For each movement of waste on- or off-site, the waste manager will obtain a signed docket from the contractor, detailing the weight, material type, its source, and the 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 construction 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 construction waste, and to highlight the successes or failures against these targets.

5.1.4. Outline Waste Audit Procedure

The appointed waste manager on site will be responsible for conducting a waste audit at the site.

A review of all the records for the waste generated and transported on- or off-site will be undertaken. 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.

A summary report will be prepared and 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 these targets can be achieved.

Waste management costs will also be reviewed. Ongoing consultation with waste contractors and Cork City Council will be pursued in order to ensure that the best practicable option is being followed for waste management on site.

Upon completion of the project, an audit will be prepared, summarising the ongoing progress and the total recycling/reuse/recovery figures for the development. This audit may be reviewed by the Waste Management section of Cork City Council.

At least two audits will be carried out during construction to ascertain if measures in place are addressing demands, and to allow for waste handling and management to be addressed with appropriate corrective measures.

6. ENVIRONMENTAL MANAGEMENT

6.1. SURFACE WATER POLLUTION

This section of the report sets out the potential sources of water pollution and other environmental issues that may arise during the construction works. Methods are proposed and discussed for controlling pollution and water runoff from the site during the construction works.

Construction works shall be carried out in accordance with CIRIA documents "*C532 - Control of Water Pollution from Construction Sites; Guidance for Consultants and Contractors*" and "*C648 - Control of water pollution from linear construction projects - Technical guidance*".

6.1.1. Water Sources on Site

The following are the sources of water that are likely or that may be encountered during the construction works.

- **Rainwater:** The primary source of water to the site is rainwater. The anticipated average annual rainfall at the site is anticipated to be approx. 1228mm annually. The rainfall intensity varies by season and is predicted by Met Eireann to be as much as 109.4mm for a 1-in-100-year event over a 24-hour duration. Heavy rainfall can have significant effects on the site. It can cause flooding and the overwhelming of site drainage systems. Flooding can have an adverse effect on on-site stored materials which would not normally pose a risk. The contractor will be required to ensure that materials are therefore properly stored on site, and to plan site activities to ensure that works such as heavy excavation, drainage, and foundation works are postponed during adverse weather conditions.
- **Surface Water:** Surface waters tend to include watercourses and waterbodies. To the west of the site there is an open drain which flows south and discharges into the River Martin, which flows along the southern boundary of the site through Blarney. A preliminary flood risk assessment indicates that the site is situated on elevated ground

within the Blarney area, outside of the designated flood plains and areas of known fluvial or tidal flooding as identified by the OPW Flood Maps. Given the sloping nature of the surrounding terrain, surface water runoff management will be a critical consideration in the site's drainage design to prevent localised flooding or erosion during extreme rainfall events. As such, prior to the commencement of construction, the Contractor is required to develop an appropriate preparation, mitigation, and operation plan to deal with the associated risks, and to plan site activities to ensure that works such as heavy excavation, drainage, and foundation works are postponed during such an event. Prior to the commencement of construction, the Contractor is required to develop an appropriate plan for the preparation, mitigation, and operation to deal with any associated risks, and to plan site activities to ensure that works such works are postponed during such an event in an appropriate manner.

- **Groundwater.** The contractor will be required, in advance of, and during site establishment, to undertake a series of trial holes to establish the ground water levels.

6.1.2. Potential Sources of Water Pollution on Site

The following are a list of potential water pollutions that could arise on the construction site.

- **Suspended Solids:** The contractor is to employ measures to ensure that water pollution does not arise as a result of suspended solids pollution. Sources of suspended solids pollution include, but are not limited to; excavation works, earth stockpiles, plant and wheel washing, and the build-up of mud on site roads. Good practice construction measures are proposed in the following sections that the contractor will be required to employ to ensure that suspended sediments from the above potential sources do not enter nearby drainage systems or any watercourse in accordance with CIRIA C532 – Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors.
- **Oils and Hydrocarbons:** Oils are a potential source of pollutants on a construction site. Diesel, lubricating oil, fuel, petrol, and hydraulic fluids are used quite readily on

construction sites for various types of machinery and refuelling and maintenance are required regularly on sites. The contractor will need to employ good practice measures to prevent these potential pollutants entering nearby drainage systems or any water course. These measures will include bunded areas for the storage of fuels, regular maintenance of machinery to ensure that no leakages occur, measures to protect the site from vandalism, and the provision of a designated refuelling area on site or refuelling off-site. Any fuel storage on site should be carefully controlled and considered to ensure that the risks associated with adverse weather conditions including heavy rainfall and high winds are accounted for.

- **Concrete and Cement Products:** It is important that cement products are carefully stored to withstand various weather conditions such as heavy rainfall and high winds to prevent run-off and dust pollution. Concrete products can cause contamination during wash down of the trucks which can cause a large volume of uncontrolled runoff. Pre-cast concrete is to be used on site where feasible. Concrete pours are not to take place on site during intense rainfall. Good practice measures are to be employed on site to prevent such uncontrolled runoff.

6.1.3. Surface Water Management Techniques

The contractor will be required to submit proposed methods for managing surface water runoff from the site during the construction operations. The following operations will require particular attention.

Excavations for foundations works:

Excavations works will require works below ground level and to control the groundwater in the areas being excavated the contractor will require to isolate the area by digging trenches to the perimeter of the foundation area with suitable falls and sumps. The perimeter drains in an open excavation such deep excavation should include French drains per the following extract from CIRIA C532 indicated in Figure 4.

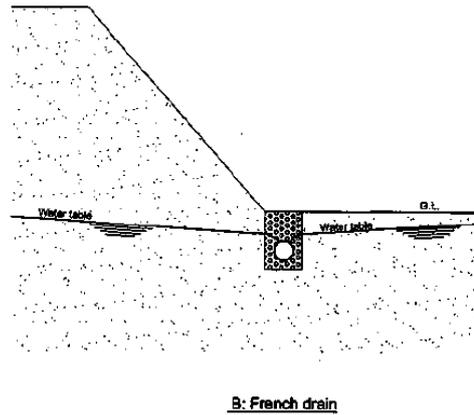


Figure 6.42 Schematic section showing water control methods

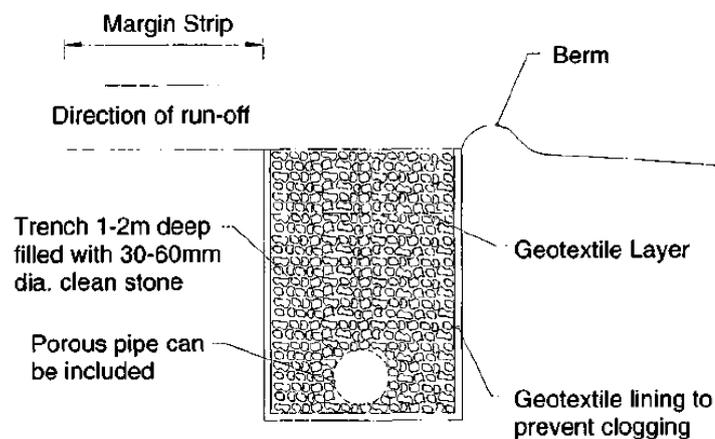


Figure 6.43 Typical filter drain detail

Figure 4 – CIRIA C532 Extract – Water control methods & filter drain detail

Discharge of ground water will be via silting ponds where suspended solids can be removed, and the water quality can be monitored. The following extract from CIRIA C532 as shown in Figure 7 provides a cross section through a typical silting pond.

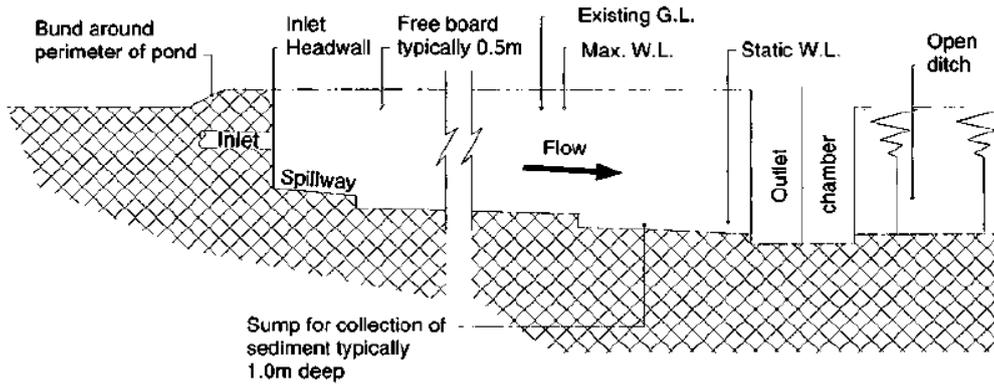


Figure 5 – CIRIA C532 – Typical silting pond cross section

Oil and Fuel delivery points:

As noted in Section 6.1.2 above, a designated fuel transfer area should be provided on-site, and this is typical good practice on well-managed construction sites. The contractor will be required to install an impermeable paved and bunded area that is capable of handling and intercepting fuel spillages. All tanks should be fully bunded and placed on a firm and secure foundation as per the following sketch from CIRIA C532 shown in Figure 8.

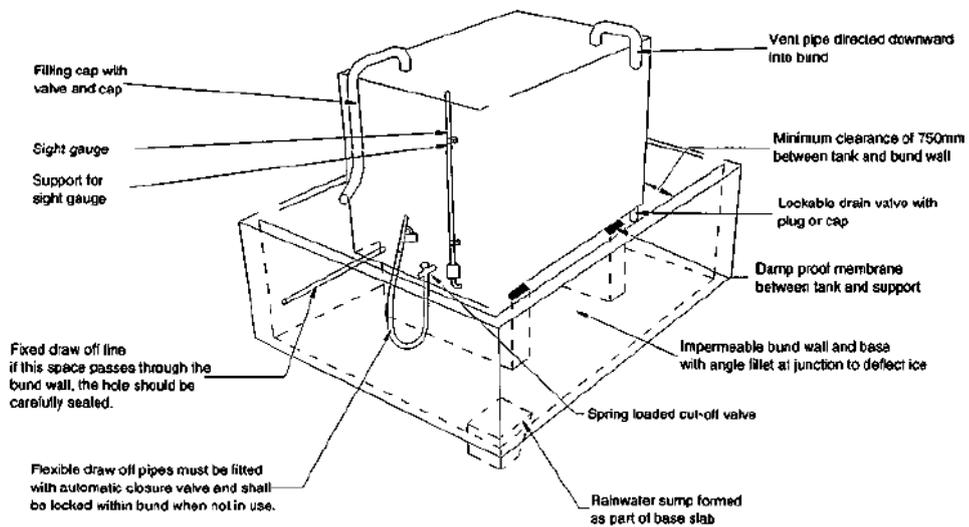


Figure 6 – CIRIA C532 – Tank Sketch

Formwork and concrete operations:

Concrete should always be placed in a controlled method to prevent spillages in accordance with good construction practice. Where possible, concrete should be placed using a concrete pump. As noted above, it is important that the machinery is well-maintained.

At the delivery and wash-down point, it is important that measures are employed to prevent spillages from concrete delivery trucks contaminating the ground. Where appropriate, pre-cast concrete is to be used and concrete pours are not to be undertaken during periods of intense rainfall.

Spillage Procedure:

A spillage procedure is to be developed which shall be enacted in the event of the release of any sediment, cement products, hydrocarbons, or other pollutants into any waterbody. In the event of such a spillage, the Environmental Protection Agency (EPA), Cork City Council, Inland Fisheries Ireland (IFI), and the National Parks and Wildlife Service (NPWS) are to be notified immediately. A hydrocarbon spill kit is to be available on site at all times, such kits are to be maintained on site and appropriate staff trained in their use.