Castlelake SHD, Carrigtwohill, Co. Cork.

Construction & Environmental Management Plan

Revision control table

Revision	Date	Issue	Prepared By	Checked By
A	23/04/2022	Review	T Finn	O Ryan
B	27/05/2022	Issue for Planning	T Finn	O Ryan

Introduction

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

- Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).
- Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
- Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
- Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
- All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

This Construction Management Plan, inclusive of Environmental Management Plan, Waste Management Plan and Traffic Management Plan have been prepared and are being issued as part of Castlelake SHD planning application. These plans are working documents, but clearly outline the arrangements in place to manage the construction and environmental management aspects of this project.

These Plans will cover all our construction activities and that of its Subcontractors for the construction period.

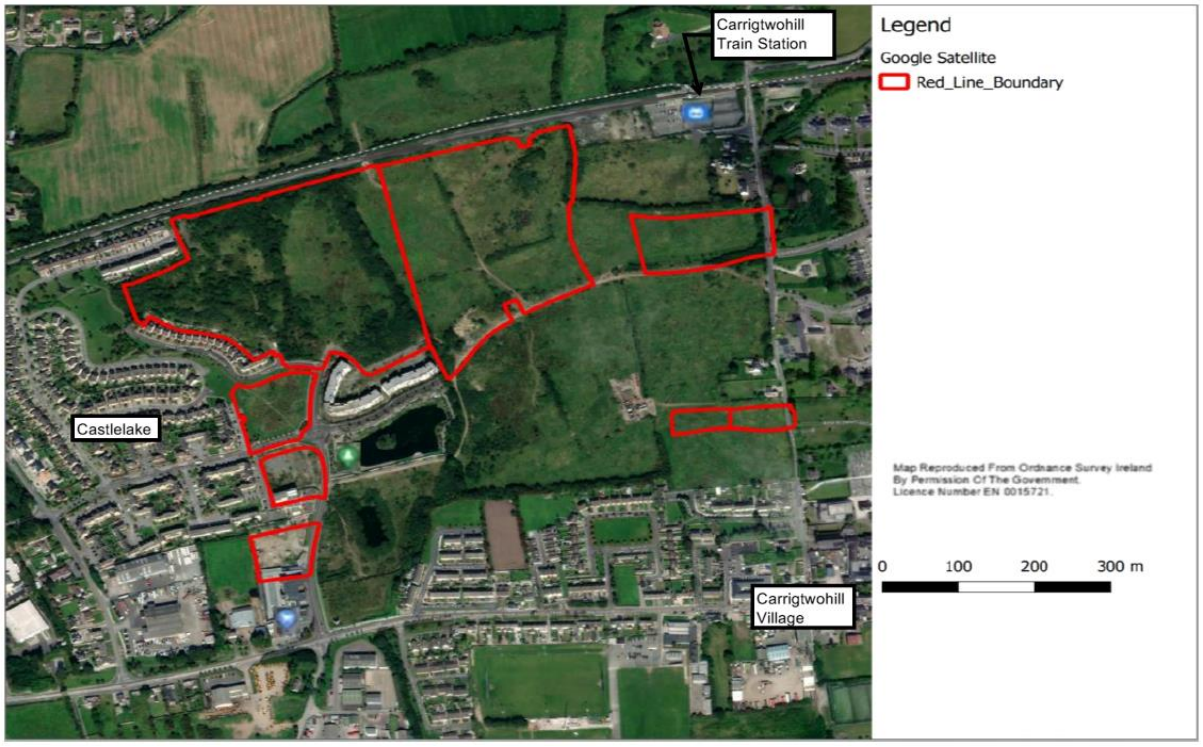
All documents are working documents and will be continually updated to reflect any changes necessary, but their authenticity will always be maintained to meet the project requirements.

Site location

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



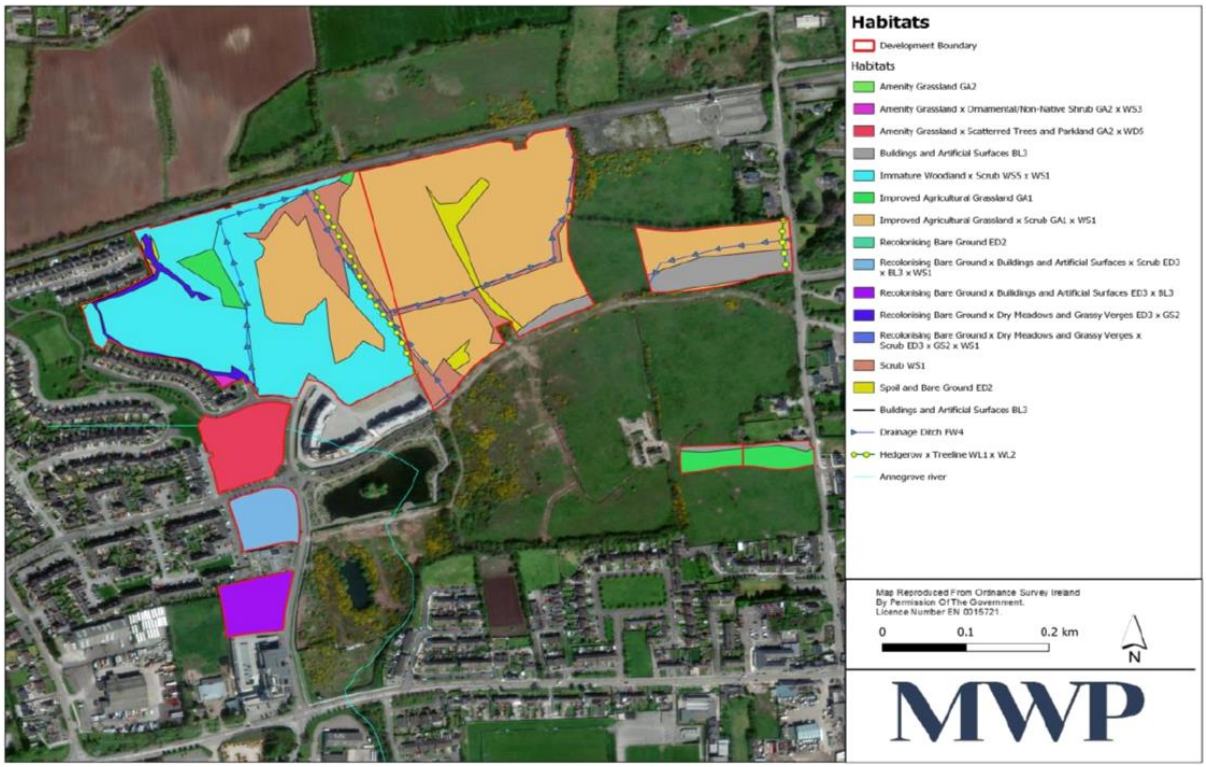
Long distant views looking south over the River Lee Valley from the top of the site.

Attractive views of the Hills north of the site, with the band of vegetation along the railway line in the mid view.

Site Description

The proposed development is relatively flat land with the highest elevation of the proposed development being ca.9m AOD. The predominant landcover at the proposed development is classified as 'agricultural Areas/Pastures' with some sections at the Southwest of the site made of 'artificial Surfaces – Discontinuous urban fabric'. Subsoil at the proposed development is classed as 'Sandstone till (Devonian' The majority of the aquifer is designated as regionally important Aquifer – Karstified (diffuse) with a section oat the northern end which is categorised as Locally Important Aquifer – Bedrock with is Moderately Productive only in Local Zones. The groundwater vulnerability of the aquifer is stated mostly as 'moderate' with small sections of the north side of the proposed development designated as 'high'.

The proposed development is located within the 'Lee, Cork Harbour and Youghal Bay' Water Framework Directive catchment (Code:19) AND THE Tibbotstown _SC_010 sub-catchment. There are a few waterbodies on site. The Woodstock Stream is the largest stream which enters the eastern most land block near Station Road and flows in a westerly direction before turning south where it flows into the Slatty Pond, which is hydrological connected to Great Island SAC and Cork Harbour SPA. Another small stream bisects the main land block and flows in a southerly direction towards the Woodstock Stream at the southwest of the site.



There are no buildings on the subject lands and are largely characterised by overgrown scrub. There are existing powerlines located on the western edge of Castlelake North.

Proposed Development Works

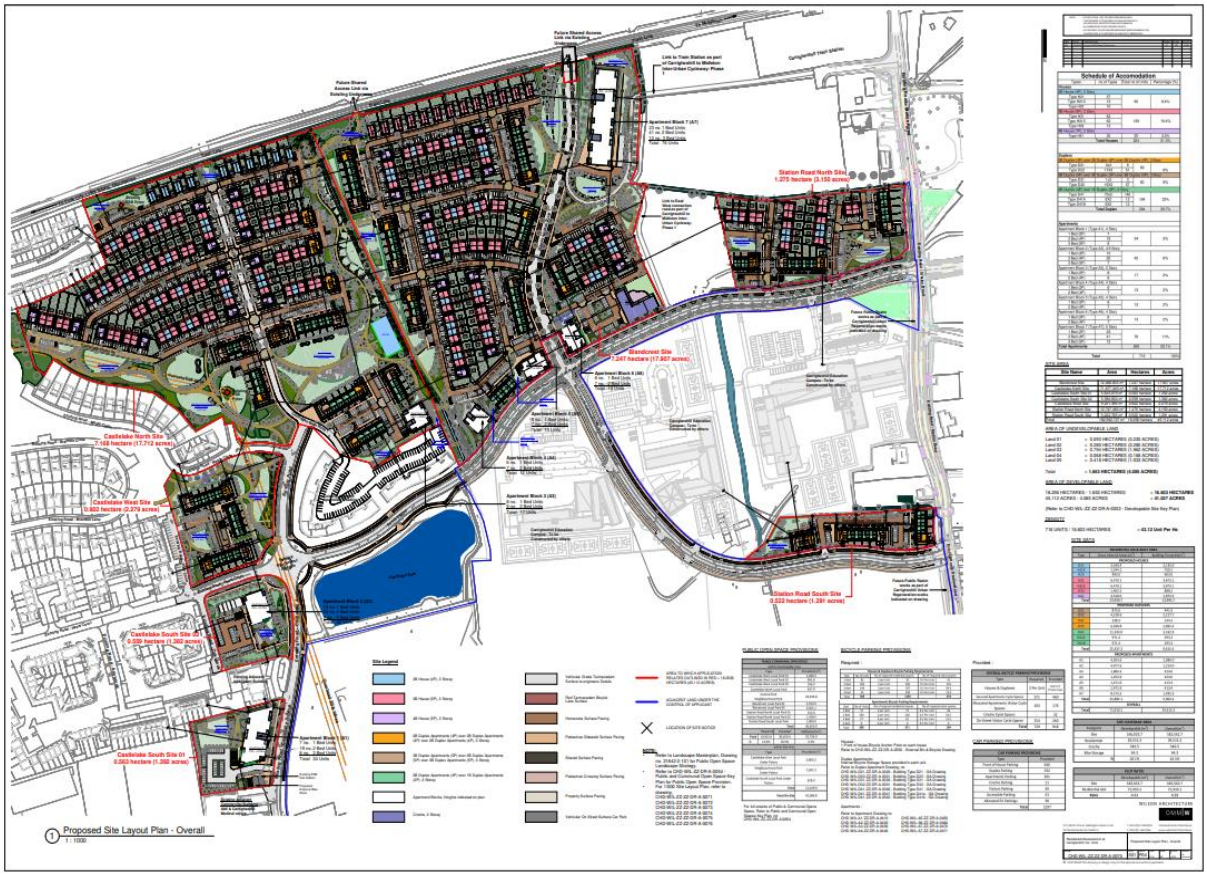
The proposed site area is 18.3 hectares. The proposed development to the East will link with the new east-west link road that connects Castlelake with Station Road and will abut the southern boundary of a significant portion of the site.

The proposed development may also benefit from the proposed Part 8 strategic cycleway scheme proposal. This scheme as proposed will provide connectivity to this proposed residential development, Carrigtwohill train station, adjacent new school development and Carrigtwohill village.

The proposed development will comprise of 224 no. houses, 284 no. duplexes and 208 no. apartments in a series of blocks ranging in height from 3-5 no. storey. In addition, the proposed development includes for a Creche and resident amenity spaces. Ancillary site works include public and communal open space, hard and soft landscaping, car parking, cycle parking, bin storage and lighting.

The proposed development is located close to established neighbourhoods with new connection points to existing local amenities through routes/walkways promoted by an active landscape scheme demonstrating the routes of individual destinations in the immediate and wider context.

The development will also complement the Carrigtwohill to Midleton Inter-Urban Cycleway Part 8 planning application that was approved on 14th March 2022.

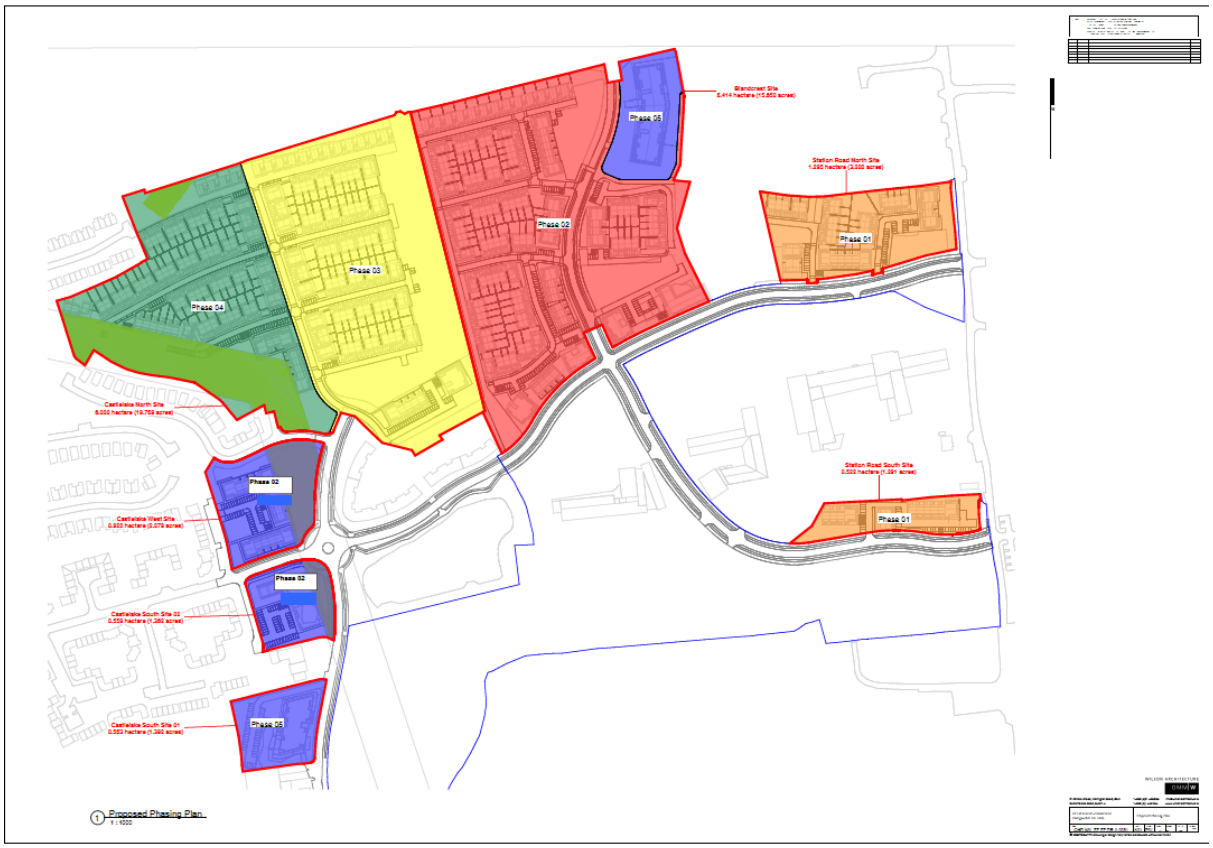


Proposed Development Layout

1.0 General Construction Works Phasing

1.1 Project Phasing Plan

The proposed works will be undertaken in several planned phases as demonstrated below. Infrastructural works required to support each element constructed will be prioritised for each phase of the development.



1.2 Construction Phase

Prior to excavation, a detail review of the final cut and fill requirements will be carried out to confirm cut and fill volumes. Detailed quantities of material to be excavated will be verified through accurate survey techniques by the groundwork's contractor at the construction phase. It is anticipated that material offsite will be minimised as levels typically are raised to protect against flood risk. Note that all imported materials will be certified accordingly for their respective use in the development.

The construction will utilise the use of both off- site and traditional building techniques in the development of each phase. Select materials as noted on planning drawings will be sourced from sustainable sources with a view to minimising waste generation on site.

Works will commence with Phase 1 of the project to the East of the Site and progress accordingly as indicated.

Material to be removed off-site will be classified in a Waste Classification Report. The classifications are 'Hazardous', 'Non-Hazardous' and 'Inert'. Material to be removed offsite will be sent either for re-use subject to appropriate authorizations or if material cannot be re-used/recovered an appropriately permitted/licensed sites will be sent for disposal. This is discussed in detail in our EMP&WMP.

2.0 Construction Management Plan

2.1 Site Access

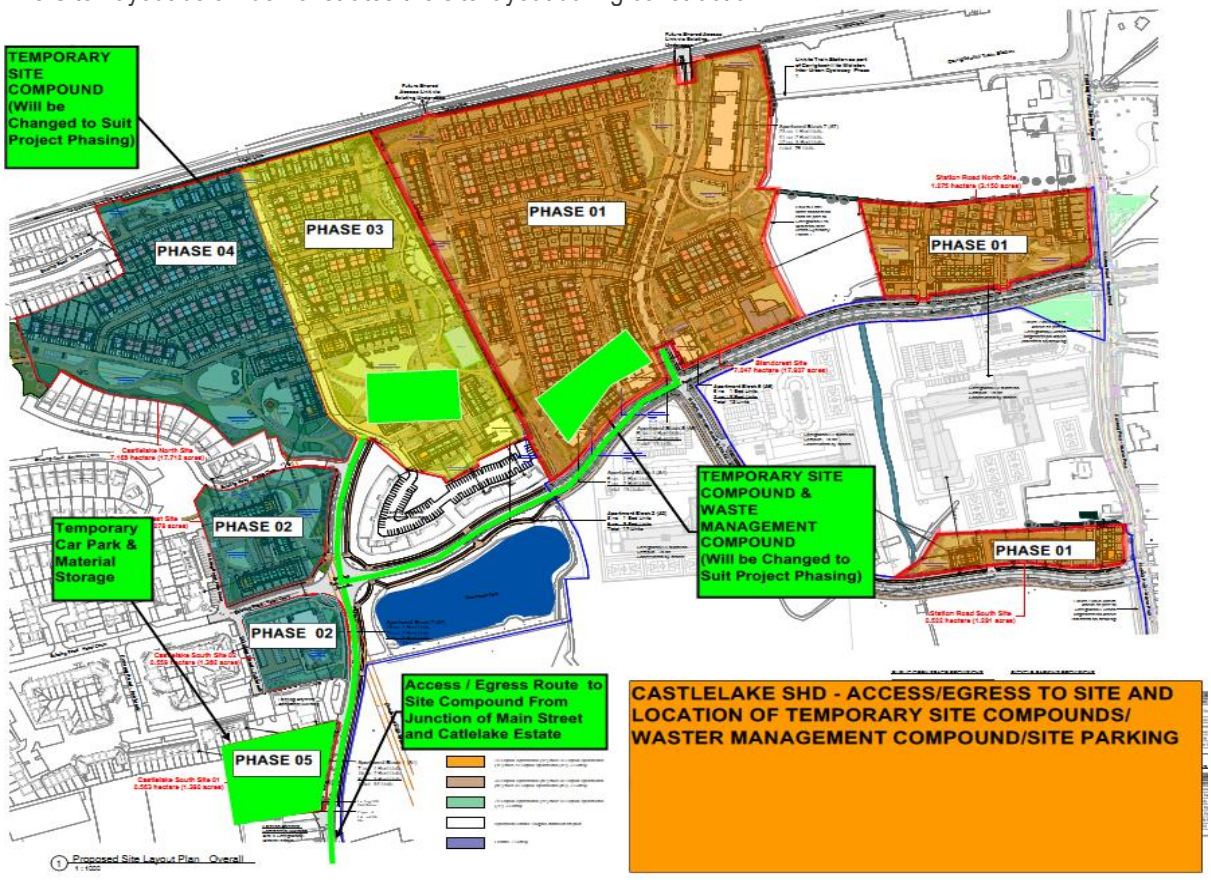
Access and egress to the development will be via the junction of Main Street and Castlelake estate in general. This will minimise the impact on Carrigtwohill village.

Appropriate operated security will be maintained at the site access gates to secure the site, to control vehicular access and to monitor and record all deliveries and removals operations.

It is expected that all vehicles will be able to drive directly into the site and turn within before exiting, limiting any potential impact on the local road network. Construction vehicle access to various phases of construction will be minimised by careful planning of the works.

Pedestrian access will be strictly controlled via manned turnstile system. Only Safe pass accredited personnel will be permitted on site and daily in-out attendance records will be maintained. Appropriate segregation will be employed on site to separate pedestrians from heavy equipment. Fenced off pedestrian walkways will be provided close to the site offices. Operatives on site will be encouraged to use public transport or cycle while temporary parking will be provided on site.

The Site Layout below demonstrates the site layout during construction.



Site layout

2.2 Site Layout & Temporary Compounds

The site layout above provides an overview of the proposed site layout to highlight proposed location of temporary site compound, waste management compound, temporary parking area and entrance and exit to the site. Note that entrances to the construction site phases will always be secured.

The Site Layout plan also denotes the location of waste materials compound on site.

Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillage occurs.

Temporary toilet facilities will be managed by the Contractor during the construction phase.

A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc.

The compound will be in place for the duration of the construction phase and will be removed once commissioning is complete.

2.3 Working Hours

It is envisaged that working hours during the construction process will be primarily standard working hours for the construction industry. We are conscious of our neighbours and surroundings and will mitigate against any intrusion caused by preparing specific method statements for specific works that could cause any negative impact.

The expected hours of works are:

07.00 – 19.00 Monday to Friday

8.00 – 13.00 Saturdays

No works are envisaged to be carried out on Sundays, should the need to work Sundays be required a written submission will be made to Cork County Council for permission to do so. Every effort will be made to ensure that no works are required outside of the above periods.
However, there may be some instances where this may not be possible for a variety of reasons e.g., works in the public road which are subject to restricted working times to minimise traffic impact. In such instances, specific agreement will be required from Cork County Council in advance of any such works taking place.

As part of our stakeholder management, we will minimise the effects of our operations on our neighbours and others affected by the works by regular communications on our planned activities, current progress, significant milestones, and planned activities on the project.

2.4 Soil Stockpiles

Stockpiles will be located away from drainage systems and silt retaining measures (silt fence/silt curtain or other suitable materials) to reduce risk of silt run-off shall be installed along the downgradient edges of stockpiled earth materials.

- All excavated materials from the site or introduced materials for construction will be either used or removed from the site.
- No permanent spoil or stockpiles will be left on site, other than those materials required for landscaping, berm construction and construction generally.

- Temporary storage areas for fuels and other hazardous materials required by the contractor during construction will be stored in appropriately bunded facilities to prevent the accidental spillage of hazardous liquids that could cause soil and groundwater contamination.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.
- A designated wash area for concrete trucks will be provided utilising a small bunded lined settlement area for concrete residues.

2.5 Hoarding & Signage

The initial work on site will include the erection of an appropriate security fencing around the entirety of the site to protect/secure the works and members of the public. The boundary to the site will always be maintained intact with regular recorded inspections undertaken. Adequate site security will be maintained throughout the contract period.

Note that as part of our traffic management for deliveries, all subcontractors and suppliers will be provided with a detailed route to site.

2.6 Car Parking & Mobility Plan

The provision of car parking on-site will require balanced consideration. It will be a goal throughout the project to limit the number of workers travelling to the site by car through a variety of means including:

- Promoting the use of the public transport options, particularly given the proximity of the Rail service.
- Providing an adequate amount of on-site cycle parking.
- Promoting car sharing amongst workers where feasible.

Please refer to our site layout plan for area assigned for site car parking.
In addition, subcontractors will be informed as part of their works to comply with the requirement that parking in the local streets is prohibited.

2.7 Material Deliveries & Storage

Materials will be delivered to site in a planned sequence to reduce on-site storage yet maintain the planned progress of the works. Storage of excessive materials on site will be avoided. Appropriate protection will be provided to vulnerable materials to ensure their quality is maintained when required to be used and to protect the environment. Deliveries will be co-ordinated via a booking system. On placement of orders with subcontractors/suppliers, a copy of the site traffic management plan and site rules with all be issued to facilitate a co-ordinated approach to future deliveries.

The site lies relatively close to the N25, and M8 Motorway so moving material and resources can be co-ordinated with minimum impact on local environment. It is our intention to avoid access to the site via the village centre to minimise effects on the local environment and infrastructure.

2.8 Construction Traffic

Public Road/Footpath

As noted earlier, access and egress to the development will be via the junction of Main Street and Castlelake estate. This route will minimise our impact on Carrigtwohill village. Construction traffic will access from the N25 Carrigtwohill/Cobh Cross Junction and avoid Carrigtwohill Village.

Practices will be incorporated to ensure the roads are always kept tidy, especially when earth excavation vehicles are in operation. This will be done in the form of washing truck tyres leaving the construction site and the use of road sweepers at regular daily intervals as deemed necessary.

The footpaths to Castlelake will remain unaffected but will be regularly monitored and cleaned if required.

Vehicle Management

As noted previously, it is proposed to put in place a management system at the site to control the movement of vehicles insofar as is reasonably practicable. Measures to be put in place include:

- Scheduling of heavy goods vehicles – this relates to all stages of development and includes vehicles for removing waste/spoil from the site as well vehicles making deliveries. This system will allow the number of any such vehicles arriving/departing the site during the peak hours to be limited to prevent any impact on the local road network.
- Particular effort will be directed to avoiding such movements during the morning peak hour on the network between 8AM and 9AM.
- Unscheduled vehicles in this regard will not be permitted access to the site and all contractors and sub-contractors will be informed of this through advance notice.
- Mobility management for site workers as set out previously including a series of measures to encourage and facilitate travel by alternate means.
- Informing workers and expected visitors regarding access arrangements and parking provision to ensure an appropriate mode of travel is chosen.
- Clear and appropriate signage within the site to advise of permitted routes, speed limits, safety requirements etc.

2.9 Liaison

Cork County Council relevant departments will be contacted and liaised with prior to commencement. Where necessary Road Opening Licence applications will be submitted for approval from Cork County Council. We acknowledge that many parties will have an interest in this project throughout the duration of the contract. Our presence during the construction phase will have a direct impact on the local environment, particularly concerning the following:

- Residents and landowners
- Tenants and Residents Associations
- Planning Authority
- Other Statutory Authorities
- Building Control

- Environmental
- Local Schools
- Local Business
- Local Groups
- Utility Providers
- Iarnrod Eireann

The contract manager will be responsible for project strategic liaison whilst the project manager will be responsible for day-to-day liaison and logistics for all the construction related activities.

Both will be permanently based on site with the project manager as the first point of contact for all concerns, issues, and complaints. A display board will be erected outside the site, which as minimum will identify key personnel contact addresses and telephone numbers.
If works interface with local stakeholders' workshops and forums will be held on a regular basis to maintain open relationships and keep stakeholders up to date on construction progress and its impact on all third parties.

Newsletters, liaison meetings, progress photos, organised site visits are all methods by which we can communicate how we intend to carry out the works and keep people informed

2.10 Waste Management

Its BAM's intention to ensure that all waste materials arising from the Castlelake SHD are managed and disposed of in accordance with the:

- provisions of the Waste Management Acts 1996 – 2013 and associated regulations.
- Waste Management (Hazardous Waste) Regulations.
- Movement of Hazardous Waste Regulations.
- The Carriage of Dangerous Goods by Road Act.
- (Shipment of Waste) Regulations.
- Cork County Council Waste Management Plan.
- Environmental Protection Act 1990: Waste Management, the duty of Care
- Project Specific Construction Requirements (Contract Documents); and
- the Company Environmental Management System
- Best Practice Guidelines on the preparation of waste management plans for construction and demolition waste projects
- "Changing our Ways" Waste Management Policy Statement

A specific waste management plan has been developed for this project and appended to this plan. **Refer to Appendix A.**

2.11 Environmental Management

A Construction Environmental Management Plan will be implemented for the construction process. The Environmental Management Plan will describe how we will manage environmental performance for the Castlelake SHD project. The EMP has been developed in conjunction with our overall Environmental Management System as certified to ISO 14001:2015.

The plan identifies environmental obligations, planning, compliance, targets, and control measures to ensure the purpose of the plan is met. As the works evolve, this plan will be regularly reviewed and updated to reflect works best practice. This Plan is contained in the appendices attached. **Refer to Appendix B.**

2.12 Environmental Emergency Plan

A Construction Environmental Emergency Plan has been developed for the construction process. The Environmental Emergency Plan will describe how we will manage environmental emergencies for the Castlelake SHD project, should such an unlikely event arise. The EEP has been developed in conjunction with our overall Environmental Management System as certified to ISO 14001:2015.

The plan identifies environmental emergency processes, maintains a state of preparedness and details controls required as the works evolve. Note that all such plans are regularly reviewed to ensure accurate and clear actions are available. This Plan is contained in the appendices attached. **Refer to Appendix C.**

Construction Waste Management Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork.

Revisions

Environmental Dept. Revision No: 01 27th May 2022			
Reason for Issue:			**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim Finn	O Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim Finn	BAM	Site
4	Engineer(s)	N/A	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

Document Control Sheet for Waste Management Plan

	Originator	Reviewer/ Approver
Name:	Elaine Maloney	Kathy O' Leary
Date:	12.02.2021	12.02.2021

Site Name	Document revised	Env Dept Rev No.	Site Rev No.	Reviewd by	Date
Castlelake SHDI	*WMP*	*Rev 10*	*Rev 00*	*HSE Officer*	*09/07/2021*

Document:	*WMP*
Site Rev No:	*00*
Changes Made:	*First Draft*
Site Reviewer:	

Document:	*WMP*
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

TABLE OF CONTENTS

Tables

Figures

1. INTRODUCTION

This Waste Management Plan (WMP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Director, Construction Directors, Contract Manager, Project Manager and Project Team to fulfil the requirements of the Plan.

1.1. Purpose of the plan

The purpose of this plan is to ensure that all waste materials arising from the *Castlelake SHD* are managed and disposed of in accordance with:

- The provisions of the Waste Management Acts 1996 – 2013 and associated regulations;
- The project specific construction requirements (Contract Documents)
- The Company Environmental Management System, and;
- Best Practice Guidelines on the preparation of waste management plans for construction and demolition waste projects.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).
Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
All blocks contain ancillary internal and external resident amenity space.

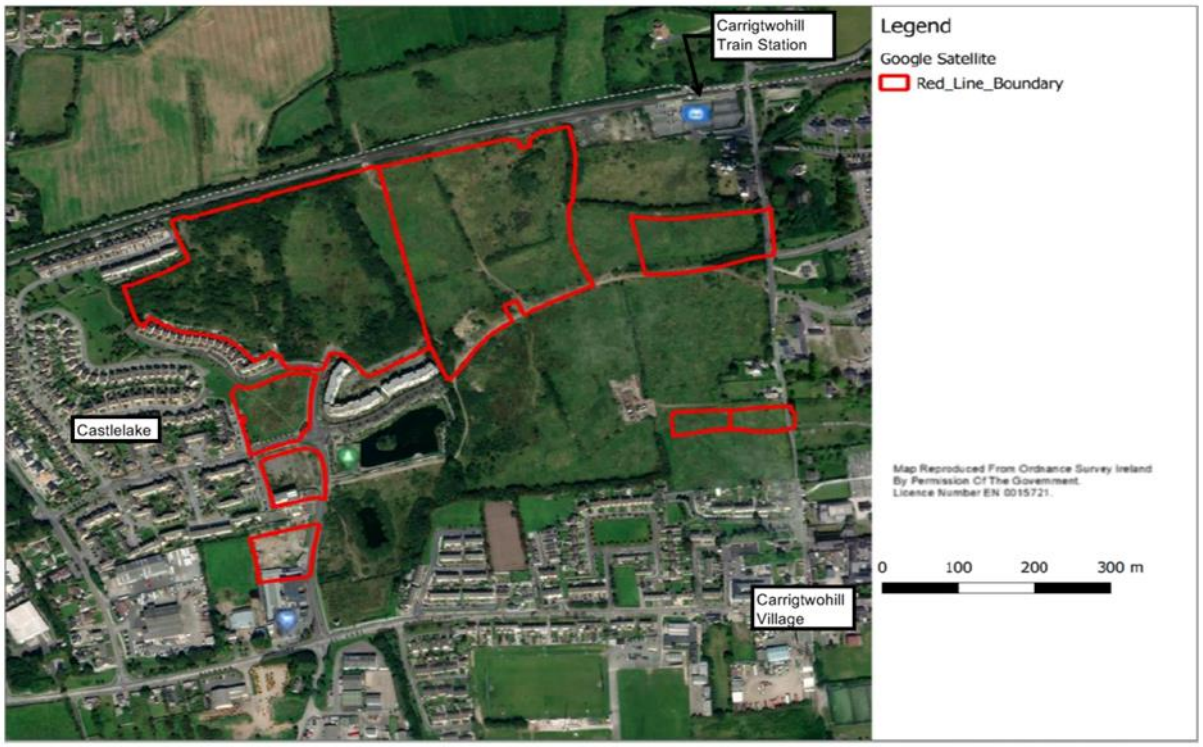
The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

1.3. Site location

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



Carrigtwohill SHD, Carrigtwohill, Cork

1.4. Working hours

Working hours will be in accordance with the Planning Conditions and Environmental Legislation. The expected hours of works are:

07.00 – 19.00 Monday to Friday

8.00 – 13.00 Saturdays

1.5. Plan objectives

The objectives of this Plan are to detail:

- Wastes arising from the substructure works and waste construction materials.
- Methods and locations used for their handling and storage on site, including a site map showing waste management areas (in **Appendix A**)
- Waste Collection Permits required for the removal of waste from site
- The disposal facilities for the waste streams and their associated Waste License or Permit.

1.6. Update and review

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site.

2. RECYCLING/WASTE MANAGEMENT STRATEGY

2.1. Recycling/Waste management goal

The recycling/waste management goal for the Project is to manage all waste in accordance with the relevant statutory provisions and the waste hierarchy:

The waste management strategy for the Project will follow the accepted waste hierarchy.

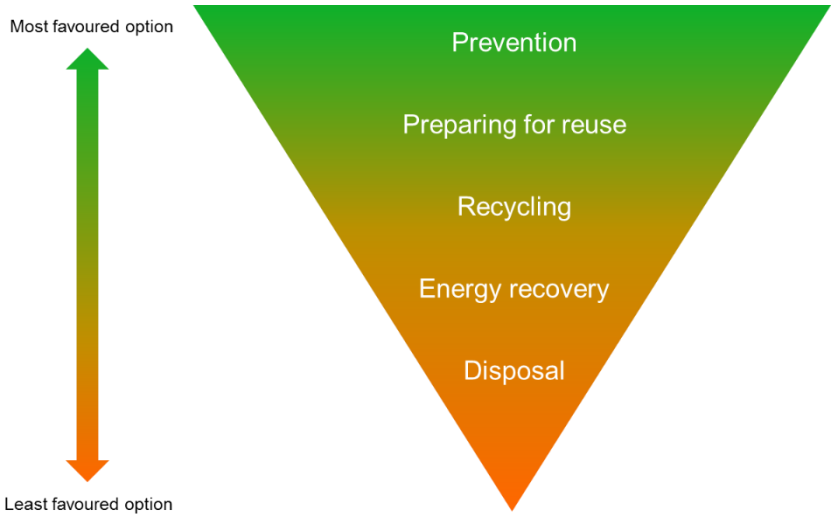
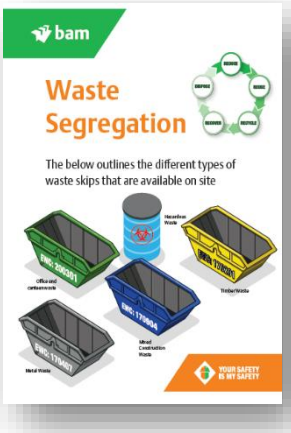


Figure 1: Waste management hierarchy

The waste management goals will include:

- Whenever possible materials for construction activities will be ordered as to prevent the minimum storage time and kept in the storage area before release to site for use.
- Materials will be ordered, where possible, in sizes to prevent wastage e.g. in form of offcuts and waste to be able to be returned to the original supplier (eg plastic pipe)
- Materials delivered to the project will be received and controlled by the Stores Manager (or similar). Materials will be stored to minimise the potential of damage or wastage. Measures will include off-ground storage (eg on pallets), remaining in original packaging, protection from rain damage or collision by plant or vehicles
- The materials storage area will be secured during out of hours to prevent unauthorised access
- A waste management compound will be set up to handle incoming waste from construction activities. This will be designed to facilitate the segregation of key waste streams to maximise the opportunity to re-use, recycle and return wastes generated on site



- The segregated waste will be placed in skip containers. Waste will be placed in the skips in such a way to minimise 'empty' void space.
- Skips will be labelled to clearly highlight waste stream for each skip. As a minimum skips and containers will be provided for segregating of the following key waste streams:

Mixed Metal	Timber	General/Mixed C&D	Packaging (Plastic & Cardboard)	Hazardous

- Hazardous waste will be kept in a secure area away from other wastes to ensure no contamination takes place
- Separate areas within the waste compound will also be allocated for the storage of plastic piping awaiting return to supplier, waste tyres and WEEE (where applicable). The layout of the waste compound will be provided in Appendix 1 of the contract-stage version of this Plan.

Waste and recycling targets

Waste and recycling targets will be to achieve:

- 100% recycling of surplus reinforcement where possible
- Reuse of all earthworks materials on site – zero export where possible (excluding contaminated materials)
- No contamination of skips – no additional costs due to inappropriate materials being placed in skips designated for particular waste streams.
- 15% reduction of total construction waste (relative to total revenue over 5 years) compared to 2020.
- Achieve >98% recovery rate for all C&O waste.
- ≤ 9.0t C&D waste generated per 100m² (gross internal floor area) *Target only applicable to building sites.

2.2. How we will achieve our targets

The waste management goal will be achieved through the implementation of several guiding principles in accordance with the waste hierarchy, namely:

- Giving preference to the purchase of materials with minimum packaging
- Storing materials in designated areas and separate from wastes to minimise damage
- Establishing take back schemes and returning packaging and unused materials to the suppliers where possible
- No pallets to be placed in skips on site
- Maximising the reuse of soils and rock on site during the construction of the Project
- Segregating construction and demolition wastes into reusable, recyclable and non-recyclable materials
- Reusing and recycling materials on site during construction where practicable

- Recycling other recyclable materials through appropriately permitted/licensed contractors and facilities
- Disposing of non-recyclable wastes to licensed landfills.

2.3. Waste license/permit requirements

The following statutory restrictions apply with regard to the collection and treatment of waste in Ireland:

2.3.1. Waste Management (Collection Permit) Regulations 2008

- All types of waste may only be collected and transported from site by a contractor who holds a National Waste Collection Permit for the type of waste being collected
- Waste will only be disposed of or recovered at a site which holds a Licence or Permit under the Waste Management (Facility, Permit and Registration) (amend) Regs 2014
- We must obtain a copy of the 'end disposal site' Licence or Permit for the waste we are disposing of
- Copies of all relevant licenses and permits will be kept on site and attached to this plan in Appendix 2, namely waste collection permits and waste facility permits.

2.3.2. Waste Management (Hazardous Waste) Regulations 1998

- Hazardous waste removed from site must be accompanied by a Waste Transfer Form (WTF) as per European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011
- Hazardous waste to be removed from Ireland for treatment elsewhere must be accompanied by a Transfrontier Shipment Form in accordance with the Waste Management (Shipment of Waste) Regulations 2007.

2.4. Hazardous wastes management

Hazardous wastes pose a risk to the health and safety of personnel as well as the environment. The Site Safety, Health & Environmental Officer should be notified of any hazardous waste or suspected hazardous waste, and consulted for assistance with handling procedures. Under the health and safety plan risk assessments and procedures are available for:

- Excavating in Contaminated Ground (PRA31-1)
- Buried asbestos in landfill (JSRA 31-2)
- Removing asbestos from existing buildings (PRA24-1)
- Environmental Bulletins 16 & 19 'Asbestos Removal' to be adhered to.

2.5. Duty of care

Responsibility for waste management lies with the principal contractor unless a contractual agreement with subcontractors to manage their own waste arisings exists.

3. WASTE IDENTIFICATION AND MANAGEMENT

3.1. General

Castlelake SHD will provide a dedicated waste handling and segregation area as shown on the site map in **Section 8** of this document.

Waste segregation should occur where possible.

The Site Agent/Foreman will:

- Oversee all waste handling operations
- Regularly check skips to ensure correct segregation has been achieved, void space is minimised and that no contamination has taken place
- Ensure the compound is kept tidy and in good appearance at all times
- Order and change skips as required.

Each waste skip and bin will be clearly labelled as to the type of waste contained.

3.2. Waste procedures

3.2.1. Excavation waste

There will be a certain amount of excavated materials re-used as fill. Any remaining material will be removed offsite via a licenced haulier to a licenced facility/ tip.

3.2.2. Demolition waste

N/A

3.2.3. Office waste

Office waste will be removed offsite via licenced carrier to a licenced waste facility.

3.2.4. Construction waste

Construction waste will be removed by licenced carrier to licenced waste facility. Expected wastes include general waster, timber and metal.

3.2.5. Hazardous waste

Not expected but should the need arise, any such waste will be removed via licenced carrier to licenced waste facility.

4. WASTE CONTRACTORS

Table 1: Waste contractors

Type		EWC code	Name of waste contractor	National Waste Collection Permit (NWCPO) No.	Waste Facility Permit No/ Waste Licence No./ COR No
Office/ canteen Waste Contractor(s)		200301	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
C&D Waste Contractors(s)		170904	Greenvalley	NWCPO-14-11381-02	WFP-CK-20-0210-01
Excavated Waste Contractors(s)		170504	Greenvalley	NWCPO-14-11381-02	WFP-CK-20-0210-01
Hazardous Waste Contractors(s)	Asbestos	170605			
	Oil & Spill Kit Material	150202			
Recyclables/Mixed Waste Contractor(s)	Packaging	150106	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Plastic	170203	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Timber	170201	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Metal	170407	Cork Metal	NWCPO-12-6-11798-01	WFP-CC-22/2019
	Gypsum	170802			
	Other (Specify)				

** Note all waste contractors must be included (e.g. excavated material, skip hire, port-a-loos, canteen waste, roadsweepings, office waste, hazardous waste).*

5. WASTE VOLUMES

5.1. Company reporting

BAM requests all waste contractors to submit waste reports to the Environmental Coordinator on a quarterly basis. Waste statistics are then compiled in accordance with the Company Corporate Social Responsibility (CSR) requirements, which has been developed in accordance with the Global Reporting G4 standard, Greenhouse Gas Protocol and CDP questionnaire. Under the reporting requirements, waste contractors issue reports detailing the volumes of waste generated and the waste destination for their sites.

5.2. Site reporting

The *Carrigtwohill SHD* site will maintain a waste log of all waste removed from site to ensure all movements are recorded on site for Local Authority Inspections. The waste log will contain the following information:

- Date of collection
- Waste description (as per the *List of Waste/European Waste Catalogue (EWC)*)*
- Name of waste collector/haulier and National Waste Collection Number (NWCP)
- Destination of waste and Facility Permit/Licence Number
- Weight.

6. COMMUNICATION AND RESPONSIBILITY

6.1. Communication

All employees and contractors are required to undertake a site induction prior to conducting any work on site. At this induction the waste management goals and strategy will be made clear and the employees will be made aware that they are responsible for ensuring the management of waste in accordance with this management plan. Three Toolbox Talks on environmental and waste issues will be conducted quarterly. For further details refer to the *Environmental Management Plan*.

Progress on the implementation of the waste management plan will be communicated to staff at the monthly safety meeting and at internal progress meetings.

6.2. Cost tracking

The Quantity surveyor is responsible for tracking the costs associated with the implementation of the waste management plan. It is essential that waste costs are communicated back to personnel, particularly if additional charges are incurred due to contamination of skips with other wastes.

6.3. Responsibilities

The Project Manager is responsible for the implementation of this Waste Management Plan and for ensuring that activities on site comply with the requirements of the Waste Management Acts, 1996 to 2013 and associated regulations.

All site engineers and foreman will be responsible for monitoring the implementation of this management plan through regular site inspections. Monitoring should be recorded on the relevant checklists (refer to Section 7).

Table 2: Responsibilities

Task	Frequency	Responsible	Name and number
WMP implementation	Ongoing	Project Manager or Foreman	Tim Finn 0872515742
Tracking costs	Ongoing (updated monthly)	Project Manager or Foreman	Tim Finn 0872515742
Notification of skip contamination	At least weekly	Project Manager or Foreman	Tim Finn 0872515742
Inspections of skips, maintenance of skip area	At least weekly	Project Manager or Foreman	Tim Finn 0872515742
Order and exchange skips	As required	Project Manager or Foreman	Tim Finn 0872515742

Task	Frequency	Responsible	Name and number
Monitoring waste management implementation	Ongoing	General Foreman/ Site Safety, Health & Environmental Officer	Tim Finn 0872515742 Donal Keohane
Issuing warning for illegal dumping in skips	As required	General Foreman	TBC
Liaising with Client, neighbours, other contractors and regulatory bodies	As required	Project Manager	Tim Finn 0872515742
Return printer / copier cartridges	As required	Site Administrator / Receptionist	N/A
Provide advice on hazardous waste handling and disposal	Ongoing	Environmental Coordinator	EM
Undertaking toolbox talks on waste procedures	Three per quarter	Site Safety, Health & Environmental Officer	Donal Keohane
Keeping records (eg checklists)	Weekly	Site Safety, Health & Environmental Officer	Donal Keohane
Completing hazardous waste consignment note	As required	Specialist Hazardous Waste Contractor	N/A
Internal audit	Quarterly	BAM Environmental Coordinator & Site Safety, Health & Environmental Officer	EM/ CW/DK

7. MONITORING AND AUDIT

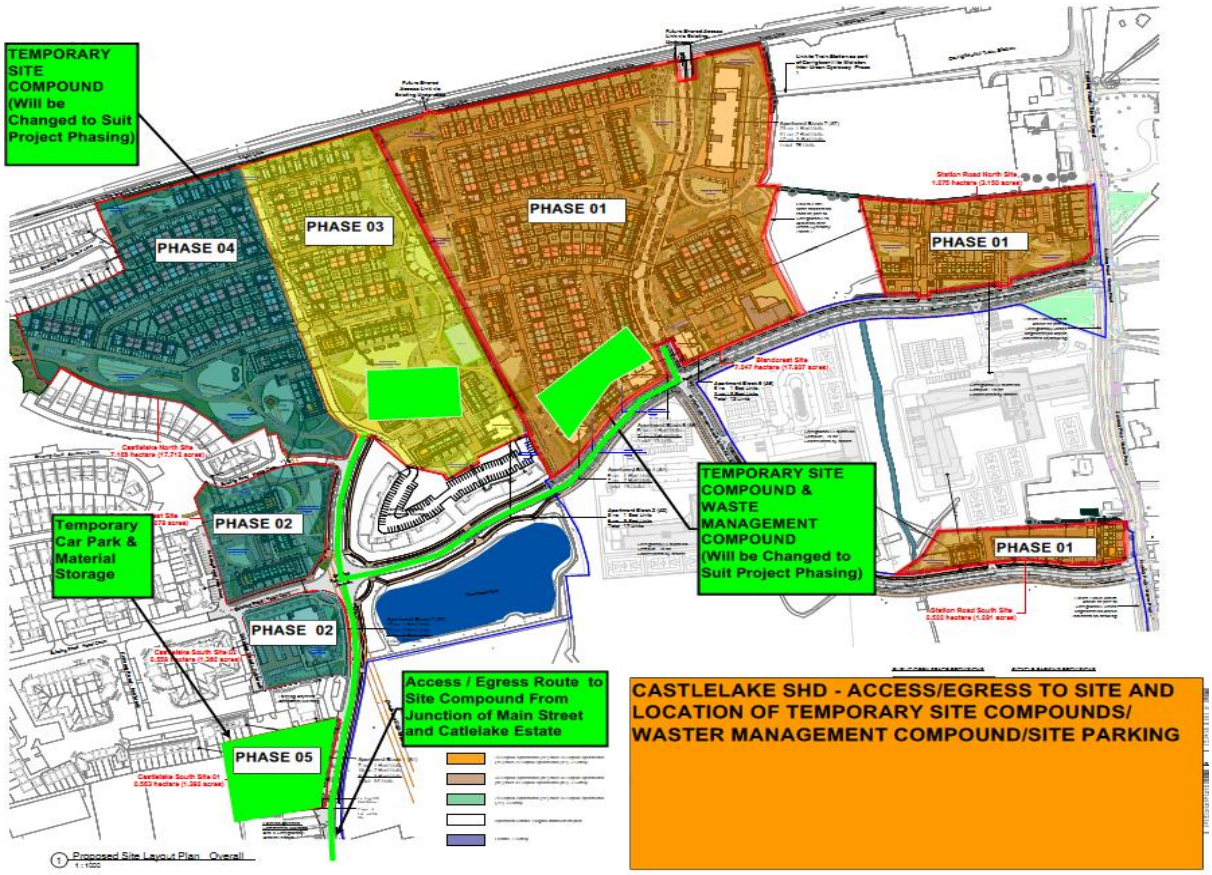
Monitoring of the waste management plan will be undertaken at various levels. The Project Manager (or similar) is responsible for tracking quantities of material sent for recycling, recovery or disposal and costs associated with each waste stream.

Monitoring the on-site implementation of waste handling procedures shall be undertaken by the General Foreman on an ongoing basis and should be reported weekly as part of the Foreman's Weekly Safety & Environment checklist. Monitoring of the skips in the main compound is undertaken by the Stores Manager or General Foreman as detailed before, and this is checked by the Safety, Health & Environmental Officer once a week as part of the general environmental inspection. Inspection reports are kept in a file on site by the Site Safety, Health & Environmental Officer. In consultation with the Site Safety, Health & Environmental Officer the General Foreman shall be responsible for any action required as a result of the weekly inspection to ensure compliance with the waste management procedures.

An audit of the waste management plan and procedures will be conducted by the Environmental Coordinator at three to six month intervals, as specified in the Site EMP.

8. APPENDIX 1. SITE MAP (SHOWING WASTE STORAGE AREAS)

On site in compound – changes through whiteboard meetings to be updated on site.



9. APPENDIX 2. WASTE LICENCES AND PERMITS

Will be located on site on site start up.

10. APPENDIX 3. WASTE CONTRACTOR CHECKLIST

Table 4. Waste contractor checklist

Question	Yes	No
Do you have a Waste Collection Permit (WCP) for EVERY Waste Contractor that collects ANY waste from the site (full copies including Appendices A, B, C & D)	✔	
Is the waste contractor permitted to collect the type of waste in question? Is the specific waste type being collected detailed in the waste collection permit?	✔	
Have you contacted the waste contractor and asked what licensed/ permitted facility our waste is being brought to?	✔	
Is this licensed/ permitted facility stated in the waste collection permit? If not, the waste contractor should be contacted and asked.	✔	
Have you checked the waste facility permit/ license to see if they can accept the waste in question? (It is very important to check this if the waste is hazardous)	✔	
Have you checked the waste transfer notes comply with EA-20 and EA-39 on Waste Transfer Notes	✔	
Have waste transfer forms been obtained for all hazardous waste removed off site?	✔	
Have waste export certificates (if applicable) been obtained for any hazardous waste shipped outside of the Republic of Ireland?		No
Have destruction certificates been obtained for all hazardous waste removed off site?		No

11. APPENDIX 4. DEFINITIONS

Re-use

Products or components that are not waste are used again for the same purpose for which they were conceived.

Recycling

Any recovery operation by which waste materials are reprocessed into products, materials or substances.

Recovery

Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfill a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

Disposal

Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

Inert Waste

Waste that;

- Does not undergo any significant physical, chemical or biological transformations,
- Will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter, or be adversely affected by other matter, including waters, with which it comes into contact in a way that causes or is likely to cause environmental pollution, or
- Will not endanger the quality of surface water or groundwater.

Hazardous Waste

Waste which displays one or more of the hazardous properties listed below:

- Explosive
- Oxidizing
- Highly flammable (liquids, substance, solid liquid, gaseous substance)
- Flammable liquid substances
- Irritant
- Harmful
- Toxic
- Carcinogenic
- Corrosive
- Infectious
- Toxic for reproduction

- Mutagenic
- Waste which releases toxic or very toxic gases in contact with water, air or an acid
- Sensitizing substances
- Eco-toxic
- Waste capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above.

12. APPENDIX - COVID 19 WASTE MANAGEMENT

Waste from a suspected case, the disposal of their PPE and the disposal of waste from cleaning the contaminated area cloths/mop heads etc

1. Waste should be placed in a plastic bag and sealed.

2. The plastic bag should then be placed in a second bag, which is then tied, and the date is labelled on the bag.

3. The waste must be stored safely and left for 72 hours.

4. Dispose of the waste as normal once the time has passed.

5. Ensure closed top pedal bin is in place in the isolation area.

6. The first aiders disposable PPE (apron, gloves etc) should also be removed as outlined above.

7. Arrangements to be made for the regular and safe emptying of bins.

In general, ensure enough bins are provided with regular removal and disposal, Dispose of used wipes/tissues/cleaning materials in a designated bin/sealed bag. Touch free bins to be provided where practical. Currently all other waste is to be disposed as usual. Refer to the BAM Good Practice Guide.

Environmental Management Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork.

Revisions

Environmental Dept. Revision No: 03 13th June 2022			
Reason for Issue:			**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim FInn	Ollie Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim FInn	BAM	Site
4	Site Agent	TBC	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

Document Control Sheet for Environmental Management Plan

	Originator	Reviewer/Approver
Name:	Elaine Maloney	Kathy O'Leary
Date:	12.02.2021	12.02.2021

Site Name:	Document revised:	Env. Dept Rev No:	Site Rev. No:	Reviewed by:	Rev Date
Castlelake SHD	*EMP*	*EMP Rev 13*	*Site Rev 00*	*HSE Officer*	*1-5-22*

Document:	*EMP*
Site Rev No:	*Rev 00*
Changes Made:	*First Draft*
Site Reviewer:	

Document:	*EMP*
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

TABLE OF CONTENTS

Tables

Figures

1. INTRODUCTION

This Environmental Management Plan (EMP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Project Director, Project Manager and Project Team to fulfil the requirements of the Plan.

1.1. Purpose of the plan

This EMP describes how BAM will manage environmental performance for the Castlelake SHD Project.

This EMP has been developed within the framework of the BAM Contractors EMS. The BAM Contractors EMS is certified to ISO 14001:2015.

This Plan will:

- Identify the environmental obligations and the hazards and risks associated with the Castlelake SHD construction activities
- Assist in the prevention of unauthorised environmental harm
- Fulfil the environmental requirements as defined in the contract.
- Minimise potential impacts on the community that relate to the environmental aspects from BAM's construction activities.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).

Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).

Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).

Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).

All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

1.3. Working hours

Working hours are in accordance with the Planning Conditions and Environmental Legislation. The expected hours of work are Monday to Friday 07:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs.

1.4. Plan objectives

The objectives of this EMP are to:

- Act as a continuous link and reference document for environmental issues between the design, construction, testing and commissioning stages of the Project
- Demonstrate how construction activities and supporting designs will properly integrate the requirements of environmental legislation, planning consent conditions, policy, good practice, and those of the environmental regulatory authorities and third parties
- Record environmental risks and identify how they will be managed during the construction period
- Record the objectives, commitments, and mitigation measures to be implemented together with programme and date of achievement

- Identify key staff structures and responsibilities associated with the delivery of the Project and environmental control and communication and training requirements as necessary
- Describe the proposals for ensuring that the requirements of the environmental design are achieved, or are in the process of being achieved, during the contract period
- Act as a vehicle for transferring key environmental information at handover to the body responsible for operational management. This will include details of the asset, short and long-term management requirements, and any monitoring or other environmental commitments
- Provide a review, monitoring and audit mechanism to determine effectiveness of, and compliance with, environmental control measures and how any necessary corrective action will take place.

1.5. Review and update

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site

2. ENVIRONMENTAL MANAGEMENT SYSTEM

2.1. Project organisation

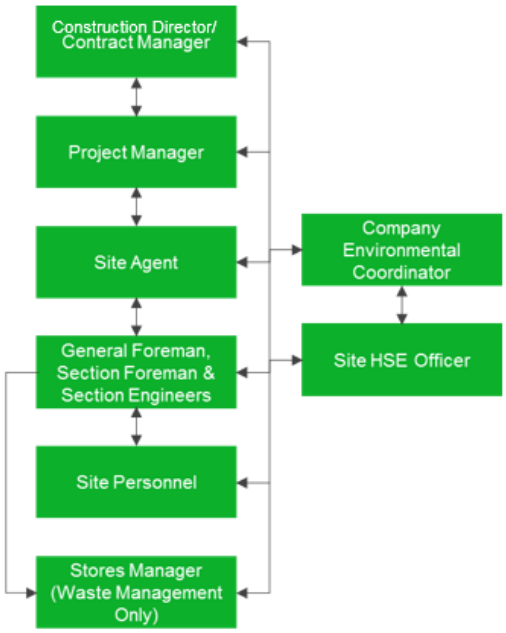


Figure 1: Environmental organisation chart

2.2. Communication

The principal lines of internal communication in relation to the EMP are shown above. Environmental issues are communicated to staff through the site induction, toolbox talks and HSE meetings.

Communication with other external parties will be in accordance with the consultation requirements (Section 6) and in response to complaints (Section 3).

2.3. Responsibilities

Table 1: Roles and responsibilities

Name	Initials	Company	Role (Job title)	Environmental management responsibilities
Elaine Maloney	EM	BAM	Company Environmental Coordinator	• Advises on environmental issues and controls, and conducts internal environmental audits.
		BAM	Construction Director/Contracts Manager	• Approves and implements EMP.
		BAM	Project Manager/Site Agent	• Monitors implementation of control measures, ensures that activities, including subcontractor activities, comply with the requirements of the relevant performance requirements.
		BAM	Site Safety, Health Environmental Officer	• Conducts weekly environmental checks and raises any non conformances with site management. • Carries out toolbox talks on environmental issues. Coordinates emergency response, including spills. • Checks spill kits and orders spill control materials when required. • Ensures the Environmental documentation is kept up to date in line with current works and is circulated. • Ensures Safety Data Sheets are communicated with users. • Coordinates water/noise/dust monitoring and remedial actions
		BAM	Site Engineer	• Ensures that works are carried out in accordance with the EMP and with the approved works method statement.
(Various)		BAM	Foremen/Supervisors	• Carrys out toolbox talks • Ensures compliance with water/noise/dust monitoring and remedial actions • Ensures that works are carried out in accordance with the EMP and with the approved works method statement • Performs weekly environmental inspections.
		BAM	Quantity Surveyors	• Tracks the costs associated with the implementation of environmental matters and forwards to the Company Environmental Coordinator as required.

3. ENVIRONMENTAL MANAGEMENT ARRANGEMENTS

3.1. Environmental management

The environmental management system (EMS) complies with the ISO 14001:2015 standard. Those aspects of the EMS relevant to this Project are outlined in this document which also contains references to specific procedures.

3.2. Planning

The environmental planning for the project is based on information from:

- The clients project information and tender documentation
- Local Authority Planning Permission
- Appropriate Assessments

Such information has been used in the environmental assessment of the activities for this project.

3.2.1. Monitoring and checking

The significant environmental aspects of the project are monitored regularly by carrying out the following at the frequency stated below:

Table 2: Monitoring and checking

Monitoring and Checking	Frequency
Environmental Inspections by Project Managers	Monthly
Environmental Inspection by Foremen	Weekly
Environmental Audits by Env Co-ordinator	Quarterly/6monthly
Surface Water Inspections (recorded)	*As required when working on or around existing watercourses*
Surface water inspection (visual)	*Daily*
Noise and Vibration Monitoring (where applicable)	*N/A*
Dust Monitoring (visual)	*As required*
Permit to pump water in use (where applicable)	*As required.*

3.2.2. Action register

A record of environmental management actions is to be kept on site. The progress for all actions is reported regularly to the appropriate member of the Management Team. Such actions will include information taken from:-

- Environmental inspections
- Audit actions: non-conformances and observations
- Progress of actions following environmental incidents
- Significant communications with stakeholders
- Project issues requiring management action
- Complaints

These actions will be added to the action register, closed out in the suitable timeframe by the appropriate person.

3.2.3. Performance

Environmental Performance of the project is monitored by:

- Environmental review meetings as a part of the Monthly HSE Meetings
- Site inspections
- Audits conducted by the HSE Department, by external organisations or by the Client
- A review of the quantities of waste created
- External communications and feedback
- Review of objectives and targets (targets table Section 7)
- Sustainability (CSR) reporting

3.3. Communications

3.3.1. Environmental complaints

All environmental complaints will be recorded in the project Complaints Register. The Register is maintained on site by a nominated member of the Management Team who also allocates responsibility for resolving any issues and follows up complaints to ensure they are resolved. Any issues that are deemed to be significant will be reported to the Site Management Team and the relevant authorities as appropriate. Complaints are reviewed during internal audits by the Environmental Coordinator, where any additional measures to improve performance are discussed. Complaints are reported to Head Office also. See EP-24 Complaints Procedures for more details.

All complaints received from external sources and incidents must be reported to the Project Manager

Environmental incidents

Environmental incidents are categorised in terms of major or minor.

Major environmental incident is any situation which has resulted in significant pollution requiring high levels of resources for response and remedy and must therefore

be reported to Site/Company Management, the Client and or any relevant statutory authority.

Minor environmental incident is any situation which has resulted in environmental pollution which required minimal action to aid recovery from Site/Company Management. Non reportable to the Client and/or any relevant statutory authority unless this requirement is stated elsewhere.

Refer to Environmental Procedures EP-06 and EP-24 for more details.

The Site Team will:

- Inform relevant person(s) on site
- Report the environmental incident immediately to the HSE Department
- Investigate and issue reports on environmental incidents (using the incident reporting system on BIM)
- Ensure corrective action is taken

Actions regarding specific incidents including water pollution and exceeding the limit levels for dust, noise, and vibration, are detailed in Section 8.

Report all environmental Incidents immediately to the HSE Department.

3.4. Subcontractors and suppliers

3.4.1. Subcontractors

All subcontractors will be required to work in accordance with BAM Contractors Environmental Management Plan. Work operations will be managed by the relevant Project Managers / Site Agents to ensure appropriate procedures are being followed. ISO 14001:2015 states consideration should be given to the aspects related to the organisation's activities, products, and services such as environmental performance, lifecycle perspectives and practices of contractors and suppliers. In order to achieve this, we ensure our subcontractors sign contracts which state they must comply with our Environmental Policy, our EMS and work within the Environmental Legal Framework while working for us on our projects.

During the recruitment stage, we would enquire as to whether they had been prosecuted with regard to breaching environmental legislation and this would also be considered. We would also enquire to the progress of their environmental management system (or equivalent) to ensure they were working in a responsible fashion and in a way which would be similar to BAM Contractors. Lines of communication would also be outlined during this recruitment stage to ensure they were aware of our environmental management system and how this will affect them and what they need to achieve in order to be suitable candidates for our Projects.

BAM have developed an online appraisal system which assesses the performance of current and previous subcontractors contracted by the company. The system requires project staff to assess and grade individual subcontractors on categories including Health, Safety and Environment, Quality, Programme and Commercial. Under our Commercial procedures, staff contracting and procuring from subcontractors and

suppliers must review the appraisal system prior to any contractual agreement. Under the appraisal management system if subcontractors or suppliers fail to meet the minimum rating, a warning is issued, and the subcontractor is removed from our approved subcontractors and suppliers list.

A list of subcontractors has been identified in the following table.

Table 3: Subcontractors

Contract	Company	Environmental contact	Commencement date	Duration
Formwork/ Concrete	To be appointed			
Groundworks	To be appointed			
Blockwork	To be appointed			

3.4.2. Suppliers

All suppliers and sub-contractors are made aware of the company's environmental and CSR policies and the project specific environmental requirements. BAM aim to collaborate with supply chain partners so as implement circular economic business models and achieve a positive environmental and economic impact. Innovative thinking between suppliers and subcontractors are therefore encouraged to promote recycling of materials and the use of sustainable materials.

An employee supervises all deliveries of environmental hazardous materials.

4. SUMMARY OF EMERGENCY PROCEDURES

Environmental emergency procedures relating to this Project include:

- Emergency Procedures for sediment release to water (EP-23)
- Containing and cleaning up spills (EP-15)
- Environmental Incident Procedure (EP-06)
- Environmental Complaints and Incidents Procedure (EP-24)
- BIM online incident tracking system.

For more detailed information please refer to <Environmental Emergency Plan>.

5. ENVIRONMENTAL PLANNING, ASPECTS AND CONTROLS

5.1. Environmental risk assessment

During the first visit to site, notes are produced which identifies any significant environmental aspects. These notes are compared with the environmental information supplied by the client (where applicable) and used as a basis for performing the environmental risk assessment.

5.2. Environmental risk assessment report

The significance of all the environmental aspects for each activity on the project have been assessed. The assessment followed the method defined in EP-02 Environmental Risk Assessment.

Refer to **Appendix 3** for the risk assessment report for this project.

5.3. Environmental assessment and management controls

The management controls, which have been put in place, are appropriate to the nature, duration, and scale of the activity on this project and the particular sensitively of the local environment. They will be revised in the event of any significant changes to the scope of the activity during this Project, especially when there is additional works, or a change in the method of works.

Additional management controls will be adopted when there are changes to client requirements, stakeholder interests to a particular local environmental sensitivity.

The significant risks which are highlighted in the risk assessment and the management controls are communicated to the workforce by site inductions and toolbox talks.

5.4. Method statements

The significant environmental aspects and the actions to apply the required controls are described in the method statement.

Method statements are produced in accordance with the contract requirements by the Site Management Team and reviewed by the Project Managers/Site Agents prior to submission for approval. When developing method statements, the EMP, Site Maps and any other relevant environmental management documents will be reviewed to assess the potential impacts of the particular activity.

All method statements will include a section entitled *Environmental and Waste Management*. For activities that have significant potential to cause adverse environmental impacts reference will be made in this section of the method statement to the control measures in Section 8 of the EMP. Additional control measures may be included where those in Section 8 prove inadequate to suit the local conditions at the

site of the activity, and/or where specific measures are required by any of the authorities. The method statement must include:

- The proposed method of construction and how impacts will be mitigated
- Waste (storage, removal, end disposal sites where known)
- Hazardous substances (storage, removal, and end disposal sites where known)
- Works close to waterways (sediment controls if needed)
- Dust
- Noise and vibrations
- Refuelling
- Fuel storage
- Drip trays/spill kits and other precautionary measures

Prior to the commencement of the works, all Method statements will be reviewed by a competent person by referring to Section 8 of the EMP. Following the review, improvements will be made to the method statements as required.

6. ENVIRONMENTAL COMPLIANCE

In accordance with Environmental Procedure 01 (EP-01) Environmental Compliance Assessment, a review of all relevant literature and contractual requirements relevant to the contract will be completed.

- Planning Conditions
- Contract Documents
- Preliminary Health and Safety Plan
- All other contractual conditions and documents.

These requirements have been tabulated in Appendix 2 (table of contractual requirements) to demonstrate how each of the requirements is addressed in the EMP.

Evaluation of compliance

Compliance will be evaluated through inspections and audits and also reviewed at the regular site management meetings.

6.1. Consultation with relevant authorities

Consultation has been undertaken with the following authorities: Local Council

- EPA
- National Parks and Wildlife Services (NPWS)
- Inland Fisheries Ireland
- Irish Water.

6.2. Site restrictions and hold points

In accordance with the Contract clauses or notification from the Client or similar the following environmental restrictions apply to the construction of the works:

Table 4: Site restrictions and hold points

Clause	**Restriction –** refer to Contract for complete details
	Engagement with IFI when working on or around existing watercourses
	Consultation with site ecologist in advance of all works particularly to address measures to be undertaken with Invasive Species.

6.3. Environmental licences, permits and permissions

6.3.1. Maintaining arrangements for environmental licence, permits and permissions

These are all legal documents associated with the work and may be from a contractor/supplier/client, or it may be an EPA or Local Authority Licences/Permit and will be maintained by the Management Team on site.

6.3.2. Licences and permits

The Client will be requested to supply information on the licences and permissions that are required for the project. The responsibility for licence applications will be established at the start of the project or when changes occur.

The relevant environmental regulator may be informed early in the project of the environmental aspects of the work. A meeting on site will be arranged where applicable.

N.B. a copy of all formal licences is to be sent to the HSE Department, Kill.

The following table identifies the licences that may be required:

Table 5: Licences and permits

Licence/Permission	Regulator	Operations
Discharge consent into watercourse or sewer	Local Authority/Irish Water	Any solid or liquid entering controlled waters (river, pond, stream, ditch) unless it is clean water
Consent for work near a watercourse	Inland Fisheries Ireland	Any work which include work over or under the water
Permissions / Licences	National Parks and Wildlife Services	Cutting of protected trees, derogation licences for protected species (bats, badgers, frogs etc), work in or near any SPA, SAC, NHA. Licences for managing invasive species
Permissions / Licences	Department of Environmental, Communities and Local Government	Excavation work in any site containing archaeological remains or natural habitat, protected Monument.
Planning Permissions	Bord Pleanala/LA	All planning permission constraints
Waste licences/permits	EPA/LA/NWCPO	Transport and removal of waste offsite

6.4. Company policy and procedures

A copy of the Company Environmental Policy is displayed at the project site offices. The policy determines the company's overall approach to environmental management, which is developed through the EMS. This EMP has been developed taking into account the:

- Company Environmental Policy
- Objectives and targets as specified in the Yearly Environmental Plan
- Requirements of relevant specific procedures as contained in the Environmental Procedures Manual.

6.5. Relevant statutory provisions

A library of environmental legislation, relevant codes of practice, standards and best practice guidance documents is maintained at the BAM Head office in Kill, Co. Kildare.

This library is updated by the Company Environmental Coordinator through regular reviews or as required by changes in legislation and standards and developments in industry best practice. A register of legal and compliance obligations is on SharePoint for general viewing.

6.6. Design and life cycle perspectives

The environmental and sustainability requirements for the project design are reviewed by project designers and construction management team and incorporated into the project as appropriate. The design and lifecycle perspectives are also reviewed by the Project Managers and Engineers to ensure that the environmental and sustainability considerations relevant to the construction works are incorporated into the works.

All environmental impacts and aspects of the project's lifecycle, from the raw materials used, procurement processes, the transportation and delivery to site, material use in the building product or service, to the end-of-life treatment and final disposal of the materials and products will be assessed, with the most favourable environmental option used where possible.

Input and consideration from relevant stakeholders will also be incorporated into both the design and construction processes. Communication with stakeholders may take place at various stages and means e.g., planning process, community newsletters, project website, Client meetings etc.

6.7. Control of documents

All documents relevant to the construction works will be kept and stored in accordance with the below table. Documents that are part of the site environmental management system, including inspection reports, monitoring records and meeting minutes will be kept for the duration of the project as per UKAS (United Kingdom accreditation scheme).

Table 6: Control of documents

No.	Document	Raised by	Retained by	Statute or UKAS	Currently held	Retention times (years)
1	Register of Environmental Aspects	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
2	Waste Transfer notes (where applicable)	External	Env Co-ordinator Site	Statute	Sites	3
3	Hazardous waste transfer notes	External	Env Co-ordinator Site	Statute	Sites	5
4	Waste Collection Permits	Local Authority	Env Co-ordinator	UKAS	Sites	Period of validity +1
5	Waste Facility Permits/Licences	Local Authority/EPA	Env Co-ordinator	UKAS	Sites	Period of validity +1
6	Energy Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
7	Water Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Sites	3
8	Local Authority / Environmental Protection Agency Licences	Local Authority / EPA	Env Co-ordinator Site	UKAS	Sites	Period of validity + 1
9	Environmental communication from external sources	External	Env Co-ordinator	UKAS	Sites	3
10	Audit Reports	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
11	Corrective Action Forms	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
12	Env N/C or Env Incident Report	Any member of staff	Env Co-ordinator Head Office	UKAS	Head Office	3
13	Water treatment log sheets	Site Staff	Site Staff	UKAS	Site	3
14	Calibration Certificates	External testers	Site Staff/ Env Co-ordinator	Statue	Site	3
15	Environmental Management Plans	Site Staff	Site Staff	UKAS	Sites	3

No.	Document	Raised by	Retained by	Statute or UKAS	Currently held	Retention times (years)
16	Waste Management Plans	Site Staff	Site Staff	UKAS	Sites	3
17	Environmental Risk Assessment	Env Co-ordinator	Env Co-ordinator and HSE Officer	Best Practice	Head Office Sites	3
18	Department of Arts Heritage and Gaeltacht	Env Co-ordinator	Env Co-ordinator Site	Best Practice	Sites	3

Controlled documents will be:

- Reviewed at least annually and updated as appropriate;
- Marked as superseded once obsolete or destroyed;
- Dated and marked with dates of revisions.

7. ENVIRONMENTAL OBJECTIVES AND TARGETS

The objectives and targets are set in relation to the aspects identified from each site in order to reduce our significant aspects. As a minimum they should include:-

- The prevention of pollution, including missions to air, water, and land
- Nuisance impacts including dust, noise, and vibration
- Protection of habitat areas and individual species, if applicable
- Storage and use of fuels and hazardous substances, including spills
- Waste management.

7.1. Environmental management targets

The environmental management targets for the project are as follows.

Table 7: Environmental management targets

Targets	Measurable	Methodology	Responsibility	Timescale
Achieve zero incidents of contamination to ground water from concrete works	Incidents, site inspections, quarterly audits, complaints	BAM procedures to be followed when working with concrete and washing out concrete chutes	Site Management Team	Start to completion
Ensure sediment on roads is cleared.	Raise needs for road cleaning duties during wet or busy periods	Ensure roads are swept and cleaned on a regular basis. Road conditions within the site should be kept clean at all times.	Site Management Team	Start to completion
Generate <9.0t C&D waste per 100m2 (gross internal floor area)	Lean Construction Techniques, segregation more, reuse more (waste hierarchy)	Purchase less, ensure packaging is removed by supplier where possible and other materials reused & recycled	Site Management Team	Start to completion
Lower fuel and oil spillages from site activities. Bunds to be used with all fuels and oils	Environmental Incidents, spills contained in bunds	Ensure that drip trays are used at all times under static plant, when refilling, & storing, ensure fuel storage areas are bunded.	Site Management Team	Start to completion
Ensure correct disposal of all hazardous wastes	Waste segregation, waste costs	All hazardous wastes to be disposed as per Irish Legislation and BAM requirements	Site Management Team	Start to completion

Targets	Measurable	Methodology	Responsibility	Timescale
Ensure no incidents of pollution to water.	Water monitoring and sampling activities. Environmental Incident.	Sediment controls to be used, no waters to be discharged to any controlled waters or drainage systems without approval. Work with CIRIA guidelines and apply BAM precautionary measures	Site Management Team	Start to completion
Lower consumption of materials and fuel on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Site Management Team	Start to completion
Reduce site electricity on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Site Management Team	Start to completion
Lower emissions of dust, smoke and fumes during works	Air quality, dust particle increase	Ensure all equipment is well serviced and maintained. Switch off equipment when not in use. Use dust suppression techniques when applicable	Site Management Team	Start to completion
Reduce amount of Public complaints	Complaints received to Site Management Team	Ensure when works which will impede public access are taking place, all residents are informed for the timescale (where applicable) and all restrictions are kept to a minimum	Site Management Team	Start to completion
Minimise water usage consumption	Water charges, waste water disposal (discharge volumes)	All grey water to be reused on site where possible. ‘Fresh’ water supply to be kept to a minimum where possible. TBT-12 Water on Construction Sites	Site Management Team	Start to completion

Targets	Measurable	Methodology	Responsibility	Timescale
Minimise risk of Aspergillus	Air quality, dust particle increase	National Guidelines for the Prevention of Nonocomial Invasive Aspergillus during Construction / Renovation activities on Aspergillus Control will be adhered to	Site Management Team	Start to completion
Minimise airborne & ground bourne noise	Noise triggers breached (where applicable)	All construction noise limits set out in the requirements will be adhered to.	Site Management Team	Start to completion
Minimise vibration	Vibration triggers breached (where applicable)	All vibration limits set out in the works requirements will be adhered to.	Site Management Team	Start to completion
Ensure no vehicle movement and material placement does not cause damage to flora and fauna	Correct habitat protection used. Wildlife surveys where applicable	All fauna/animal species to be untouched where possible. Professional advice to be sought on removal procedures	Site Management Team	Start to completion

The standard environmental management goals for the project are to:

- Conduct all activities in accordance with the:
  - Company environmental policy and procedures;
  - Relevant statutory regulations and provisions;
  - Contractual requirements with the client; and
  - Requirements of relevant authorities;
- Minimise adverse environmental impacts during construction;
- Enhance natural environments during the course of construction, where practical
- Reduce the significance of our aspects and impacts through our working methods
- Increase subcontractor awareness of our EMS
- Increase company awareness of sustainability issues

BAM Contractors has established company environmental and sustainability targets which are documented in the 2021 Environmental Year Plan. These targets include;

- 3% reduction of total construction waste (relative to total revenue) compared to 2020.
- 5% reduction of the relative CO2 emissions (total CO2 per total revenue) compared to 2020.
- Achieve >98% recovery rate for all C&O waste.
- < 4 reported environmental incidents annually.
- Achieve zero spillages to water courses.
- < 10 reported environmental complaints annually.
- All sites to achieve 93% pass rate in environmental audits.
- ≤ 9.0t C&D waste generated per 100m² (gross internal floor area) *Target only applicable to building sites

In order to help achive these targets, the below table highlights compliance tools.

7.2. Initiatives to achieve targets

Table 8: Initiatives to achieve targets

Sites	Area	Objectives and targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
All sites and offices	**Waste**	Eliminate waste sent to landfill	Adhere to the waste hierarchy. Lean construction techniques	EA-30 Excavated materials on site (*Article 27 Notification Forms*). CIRIA documents on Lean Construction	Site Teams and HSE Dept.
		Increase site segregation of construction waste by 10%	Additional recycling skips on site Increase staff knowledge and participation	EP-16 waste definitions and classifications, TBT-03 Managing Waste, TBT-02 Environmental Awareness, EB-11 Site Set up	Site Teams and HSE dept.
		Increase recycling rates	Increase site awareness of improved waste management practices	Waste posters, environmental information to be issued focusing on new waste strategies	Site Teams and HSE Dept.
All sites and offices	**Energy**	SMART Meters for all sites	SMART meters installed in cabins	Advice on installation and data collected	Site Teams and HSE Dept
		Reduce CO_2 emissions	Implement an energy reduction initiative in sites and offices	Environmental information to be issued focusing on new waste strategies	Site Teams and HSE Dept
		Temperature control in cabins	Thermostats installed	Advice on installation and data collected	Site Teams and HSE Dept

Sites	Area	Objectives and targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
		Energy initiatives	SEAI Initiatives	Online calculation tools (energy) Energy posters Relatively paperless sites	HSE Dept IT Dept.
		Reduction in fuel usage / air emissions	Car Purchasing	Procurement of low emissions vehicles by Plant Department. Video conferencing capabilities in Offices to cut down on travel times, emissions.	Site Teams and HSE Dept
All sites and offices	**Auditing And performance**	All sites to achieve 'Pass' mark from quarterly audits >93%	Quarterly audits	Regular environmental information and directions to be issued to the sites	Sites Teams and HSE Dept.
		Appraisal system for environmental performance	Subcontractor appraisal system (COINS)	Detailed information of the systems and scores circulated to all.	Sites Teams and HSE Dept.

8. ENVIRONMENTAL CONTROL MEASURES

Control measures will be implemented both on an activity specific basis for the area of works, and independently of any specific activities as part of the general site management. Throughout this section reference may be made to standard procedures contained in the Environmental Procedures Manual that will be adopted on site. The Environmental Procedures are available on SharePoint.

The project will be developed in accordance with the control measures and with reference to the following guidance documents:

- BRE (2003) Control of dust from construction and demolition activities
- BS 5228-1: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 1: Noise
- BS 5228-2: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 2: Vibration
- BS 5837: 2012 Trees in relation to design, demolition and construction works
- BS8895-1:2013 Designing material efficiency in building projects Part 1: CoP for strategic definition
- CIRIA 741 (2015) Environmental Good Practice On Site (Fourth Edition)
- CIRIA 532 (2001) Control of Water Pollution from Construction Sites – Guidance for consultants and contractors
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in adjacent to Waters
- Fisheries Guidelines for Local Authority Works (Department of Marine and Natural Resources, 1998)

Other guidance documents may be referenced for specific issues throughout this section. Copies of these documents are held by the Company Environmental Coordinator and on SharePoint.

The control measures and monitoring requirements listed in this section must be implemented throughout the project.

8.1. Water Pollution Control

All watercourses that are potentially impacted by the works are identified on the site maps included in Appendix 4.

8.1.1. Water Pollution Control & Mitigation Measures

BAM as representative will secure the services of a suitably qualified Ecologist to act as an Ecological Clerk of Works (ECoW) to record the efficacy of water quality protection measures and measures to avoid noise disturbance to wintering birds set out in the following sections.

The following mitigation measures are included and will be completed as part of the Project.

Management of Water Quality

A Management Plan has been developed for the project to ensure that the construction works will not deteriorate the water quality and will safeguard existing water. The key to avoid impacts to water during the construction works is good site management practices, tight controls, regular inspections and ongoing vigilance with staff and employees on site.

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- IFI (2016) *Guidelines on protection of fisheries during construction Works in and adjacent to waters* (IFI, 2016).
- Masters-Williams *et al.* (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).* CIRIA.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649). CIRIA.*

In addition, the following construction surface water management measures will be implemented and monitored for the duration of the works. The potential for the construction works to have an impact on the quality of the local watercourses will be minimised through the implementation of the following control measures as outlined:

Contact will be maintained with the relevant authority such as the Inland Fisheries Ireland when required.

- Special attention will be paid to minimising the opportunities for wash-off of inert solids (usually from exposed soil mounds, embankments or excavated trenches etc.) from entering watercourses. Silt traps will be used where necessary around the open steams and watercourses.
- A sedimat will be utilised for the protection of streams from sedimentation damage during in stream construction activities for the installation of culverts,
- Care will be taken to avoid interference with the supply or quality of any groundwater resource.

- Waste products associated with the works will not be permitted to enter watercourses adjacent to the works through the use of French drains, petrol interceptors or other agreed methods.
- Water that is high in solids or contaminated with cement or oil, will not be pumped from excavations directly to watercourses without pre-treatment (e.g. sedimentation/ filtration and oil separation).
- All site run-off associated with the construction will be directed to storm control areas or tanks to prevent direct discharge into water courses.
- All operational machinery used in-stream will be kept to an absolute minimum.
- Spill kits will be provided at all river locations identified.
- Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from watercourses. Refueling of machinery, etc. must be carried out in bunded areas. Fuels will be stored during the construction phase in bunded fuel storage tanks with a 110% holding capacity. Where it is necessary to dispense fuels on site, this will be undertaken in areas covered with an impermeable surface to protect surface water and ground water;
- Construction works, especially ones involving the pouring of concrete, will be conducted in the dry. Precast concrete will be used in preference to uncured concrete, which kills aquatic fauna through alteration of stream pH. When cast-in-place concrete is required, all work will be done in the dry and allowed cure for 48 hours before re-flooding.
- To help prevent the contamination of the ground and groundwater, contaminated materials (oils, fuels, chemicals etc.) will be used and stored in an appropriate manner as outlined in the relevant guidance, i.e. CIRIA (2001) and DMRB Volume 11 (1994).

Should any monitoring or inspection indicate that pollution of the Castlelake Roads Infrastructure or adjacent watercourses has occurred then the Site Management Team will immediately inspect all work activities to ascertain whether they are operating effectively. All works may be stopped and/or additional control measures installed to prevent further pollution or discharge to the watercourse. Appropriate action will be taken in consultation with the Site Agent. Water samples will be taken at the watercourse if required.

Silt Fencing

As an additional measure where the construction works are adjacent to a water course silt fencing will be installed. The purpose of the silt fence is to retain any soil and silt disturbed during construction and prevent it from entering into watercourses.

Inspection and Maintenance

The construction drainage system for the proposed development must be managed and monitored at all times and particularly after heavy rainfall events during the construction phase. The construction drainage system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to limit/prevent water pollution.

Management of Concrete

To reduce the potential for cementitious material entering surface waters, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Environmental Manager. 22461 Castlelake Strategic Housing Development EIAR 61 May 2022

Management Measures will include the following:

- The Construction Manager will ensure that the area of the pour is completely drained of water before a pour commences.
- Pours will not take place during forecasted heavy rainfall;
- Incidental rainfall from light showers during the period of a pour is typically absorbed into the concrete matrix but heavier showers can result in some run off from the top surface of the concrete pour. If run-off is encountered the Environmental Manager will block the outflow from the drains to retain or treat the run-off until the pH is neutral before discharge to the drainage network;
- In the event of a spillage on site, the Environmental Manager will temporarily block the dirty water drains in the immediate area and monitor the pH levels of the water in the open drainage channel and if necessary, will adjust the pH levels using CO2 entrainment. Any spillage will be cleared immediately and deposited in the Chute wash down area;
- To reduce the volume of cementitious water, washout of concrete trucks will not take place on site. Concrete trucks will be washed out off site at the source quarry. Only Concrete truck chutes will be allowed to be cleaned on site at a central concrete wash out area.

Fuel and Oils Management

Fuel Management Measures that will be employed during the Construction phase include:

- The potential for hydrocarbons getting into the existing drains and Lough Mahon will be mitigated by only refuelling construction machinery and vehicles in designated refuelling areas using a prescribed re-fuelling procedure;

- Refuelling will be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using;
- To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up to date service record will be required from the main contractor;
- Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all delivery vehicles for major leaks. Contractors supplying concrete and crushed stone to the site will be contractually required to supply their products using roadworthy vehicles;
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits. This contaminated material will be properly disposed of in a licensed waste facility;
- The Environmental Manager will be immediately informed of the oil leak/spill, and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil, and initiate the clean-up if necessary;
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery;
- Corrective action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction;
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.

Stream Enhancement Works

Some reaches of the Woodstock Stream within the study area have been modified in the past and/or degraded due to adjacent land practices and/or re-sectioning (straightened and realigned). The physical character of the Woodstock Stream will be diversified by using guidance in '*Channels and Challenges - the Enhancement of Salmonid Rivers* (O'Grady, 2006) as well as O'Grady *et al*, (2017). This will increase the quality and quantity of salmonid spawning, nursery and holding habitat. This will offset past degradation and compensate for any impacts that may occur during construction stage on these reaches of the Woodstock Stream.

The following is proposed regarding enhancement of the Woodstock Stream:

- Instream enhancement and riparian enhancement;
- Removal of most of concrete rubble. Some can be used in conjunction with imported gravel to create instream features;
- Creation of riffle, glide1 and pool sequences along both reaches by installation of rock pools. This Installing a series of stone weirs (notched and vortex) at gradient breaks and higher gradient stretches along the channel. Weir construction would be at least seven channel widths in distance apart;
- Introduction of instream random boulders;
- The works will commence at the top of the reach and progress downstream;
- The works would be undertaken outside the salmonid spawning season, so would have to be carried out between June (or July) – September inclusive; and
- Riparian enhancement will involve the sporadic planting of native trees and shrubs.

These works would be overseen by the ECoW who will be familiar with rivers work and have a good knowledge of salmonid habitat requirements. To this end, the ECoW will have a general knowledge of content outlined in publications such as '*Ecology of the Atlantic Salmon*' (Hendry and Cragg-Hine, 2003) and '*Trout and Salmon - Ecology, Conservation and Rehabilitation*' (Crisp, 2000). Duties will include the delivery of toolbox talks and monitoring of construction phase to ensure all environmental controls with reference to IFI (2016) are implemented in full. The ECoW would consult/liaise with the IFI during the works.

Under the Fisheries (Consolidation) Act, 1959, and as revised (2010), it is an offence to disturb the bed of a river; therefore it will be necessary to get written permission from Inland Fisheries Ireland to proceed with the works in any areas where disturbance to the spawning and nursery areas of salmonids will occur as a result of the proposed development.

8.1.2. Water Pollution Incidents

Should any monitoring or inspection indicate that pollution of the *Castlelake SHD Project* or adjacent watercourses has occurred then the Site Management Team will immediately

inspect the all work activities to ascertain whether they are operating effectively. All works will be stopped and/or additional control measures installed to prevent further pollution or discharge to the watercourse. Appropriate action will be taken in consultation with the Project Manager. Water samples will be taken at the watercourse if required. The incident will be logged on the incident reporting system on BIM.

8.2. Invasive Species Action

During an ecological survey site visit in August 2021 in relation to the preparation of a report to inform the appropriate assessment screening ("AA screening report"), the following invasive species were identified within the redline boundary of the proposed development site:

- Himalayan balsam (Impatiens glandulifera);
- Japanese rose (Rosa rugosa)

Figure 2: Showing areas of Himalayan balsam (Impatiens glandulifera – green hatching) within and adjacent to site and Japanese Rose location (Rosa rugosa) within the site redline boundary (pink circle)

8.2.1. Himalayan Balsam (Impatiens glandulifera) Eradication

Best Practice Management Measures

Himalayan balsam (Impatiens glandulifera) is listed on the Third Schedule of the Birds and Habitats Regulations and is considered a high-risk invasive species, which has the ability to create competition for resources such as pollinators, light and space, posing a threat to native plant species.

In line with guidance published by the National Roads Authority, now Transport Infrastructure Ireland (The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, 2010) the following control options were identified:

Option 1 – Physical control: Physical removal should be attempted where the ground is level and good access is possible. In the circumstances, plants can be strimmed, cut, or mown back to ground level before flowering in June. The plant should be cut as low as possible, or at least below the lowest node, otherwise re-spouting will occur. Any mechanical removal of Himalayan balsam before June will promote greater seed production in re-growth. The area should be mown regularly to prevent sprouting and flower formation and repeated annually until area is under complete control.

Hand pulling is also another effective method of removal given the shallow rooting of Himalayan balsam. Hand pulling should be repeated in August to deal with sprouting of seeds. Plant material can be disposed of via compost, though due to potential presence of seeds, disposal of landfill or disposal by burning may be favourable.

Option 2 – Chemical control: Effective control of Himalayan balsam using chemical application of glyphosate or 2, 4-D amine applied during the active growth phase in late spring targeting germinating seedlings. However, it should be noted that glyphosate is a broad-spectrum herbicide so care should be taken when applying amongst sensitive species or adjacent to waterbodies where there should be a buffer zone of no chemical application, according to the product instructions.

Grasses are unaffected by glyphosate; therefore, chemical control may be preferable in circumstances wherein grass types are present. Guidelines recommend repeat treatments for five or more year. Ongoing monitoring of the site will also be required in spring and summer to assess seedling presence and possible further control measures.

Proposed Measures for Eradication of Himalayan Balsam at Carrigtwohill

It is recommended that a combination of the options outlined above is undertaken to eradicate and avoid the spread of the plant both within and outside of the site. The proposed measures are outlined in the following section.

Due to the extensive nature of the established Himalayan balsam on site, existing plants will be mowed to ground level before flowering occurs in June and where ground is level. Hand-pulling methods may also be employed during the pre-flowering season and is most effect following rainfall. Pulled and mown sites will be revisited in August for follow-up pulling. Stockpiled material should be removed, covered and fenced off, to prevent any further spread of seeds on site. Works will be undertaken always using a single designated piece of machinery, e.g., one strimmer, mower, cutter etc. Vegetation material removed via physical controls should be disposed of via landfill or burning to remove risk of by propagation by seeds. Coincidentally, chemical control measures may be employed in late April to May, during the active growth phase in late spring, using glyphosate. The chemical treatment may be applied using foliar spray, wiper application or spot treatment.

Areas treated with glyphosate will require retreatment in later summer months to target seedling germination and again annually for ongoing control. Given the extensive nature of Himalayan balsam at the site, it is recommended that follow up monitoring is undertaken on the site and spraying of regrowth carried out as necessary. Further to the above, toolbox talks will be carried out to communicate measures to all personnel involved.

Biosecurity Measures

In addition to the above, the following biosecurity measures will be implemented:

- Any vehicles/plant operating within the infested areas will be cleaned thoroughly when entering and / or leaving the exclusion zones.

o Designated wash-down areas will be set up within the exclusion zone, and away from drains and watercourses; plant/equipment will be washed down on geotextile membrane, so that any potential contaminated material will be contained.

o Vehicles will be cleaned of all earth and loose sediments, with particular attention paid to tyre treads, wheel arches and hinged joints.

o The minimum amount of machinery possible will be used to minimise the potential spread of the species.

o All tools, materials and work wear will be inspected, and cleaned as necessary, with particular attention paid to footwear and hand tools.

- Work boots will be dipped in or scrubbed with a disinfectant solution and thoroughly dried afterwards before being used on the site for the first time;

- PPE and tools will remain on site for the duration of construction;

- All PPE will be visually inspected and any attached vegetation or debris removed.

8.2.2. Japanese Rose Eradication

Best Practice Management Measures

Though not a species listed under Third Schedule, control of Japanese rose to prevent its spread within the area should be implemented to avoid inadvertent propagation of this species. Physical removal of the entire plant, at both small- and large-scale infestations, is recommended. Chemical control using herbicide is also an effective control.

Proposed Measures for Eradication of Japanese Rose at Carrigtwohill

Physical removal of the plant by hand-pulling is effective for small populations but roots and rhizomes must also be removed to prevent recolonisation. Hand-pulling can be combined with application of glyphosate. Applications of the herbicide can be made with brush to avoid affecting other plants. As per chemical control of Himalayan balsam, use of herbicide must be fully in keeping with manufacturer instructions and with consideration to appropriate buffer zones when adjacent to water bodies. Follow up monitoring and treatment will be necessary to ensure full long-term eradication (Weidema, 2006).

Biosecurity Measures

Japanese rose is suspected to disperse via rhizomes, water, and seeds within fruit. Therefore, a similar protocol as that described for 8.2.1 should be employed when removing Japanese rose.

8.3. Noise & Vibration Control

The primary sources of noise and vibration associated with the project have been identified as follows:

- Machinery
- Concrete Pours
- Hand tools
- Generators.

Noise criteria used for assessing the significance of construction impacts are as follows: *example given below – amend as per contract requirements or use BS 5228-1:2009+A1:2014)*

Period	Hours	Ambient Noise Level, Leq measured on site (dB(A) Note 1	Period of hours over which Leq, is applicable	Maximum allowable sound level on site (dB(A) Note 2
Days	0700 – 1900	65	1 hour	80
Evening	1700 – 2200	55	1 hour	65
Weekends	0800-1300	55	1 hour	65

Note 1: Determined from Methodology in BS 5228 Noise & Vibration from Open and Construction Sites.

Note 2: Sourced from National Roads Authority Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

These levels apply at 1m from the façade of neighbouring noise sensitive buildings.

Operating limits for vibration are as follows:

Freqency	Vibration Limit	Intervention Value
<10 Hz	8mm/s	6mm/s
10 to 50 Hz	12.5mm/s	10mm/s
50 to 100 Hz	20mm/s	16mm/s

All works are scheduled to be completed within the *Working hours are in accordance with the Planning Conditions and Environmental Legislation in that we will operate*

between Monday to Friday 07:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs. No works will occur on Sundays or Bank Holidays & as specified in the contract.

Best practicable means should be employed to minimise noise levels, in accordance with the British Standard BS 522: 2009+A1:2014. Noise and vibration control on construction and open sites (Parts 1 and 2) for basic information and procedures for noise and vibration control. A copy of this standard is available at the site or from SharePoint.

8.3.1. 8.2.1 Noise & Vibration Control Measures

Noise reduction measures will be undertaken in accordance with the Procedure EP-09 Noise and Vibration Control, which has been developed taking into account the requirements of BS 5528, particularly Section 10, and include:

Plant and machinery in good order
Working within the allowed site hours
Turning off machinery/ plant when not in use.
RAMS to include specific noise controls

8.3.2. Noise and vibration monitoring

Noise will be monitored regularly and recorded for high noise generating activities via a handheld monitor as required.

All boundary walls/ structures will be surveyed and recorded prior to any works commencing and will be visually monitored during construction works.

8.3.3. Noise and vibration incidents

Should any monitoring indicate that noise or vibration levels have exceeded the intervention values then the plant or equipment causing the noise / vibration will be powered down immediately. Appropriate action will be taken in consultation with the Project Manager to reduce the noise and/or vibration levels. Actions may include:

- Servicing and or modifying the plant / equipment
- Replacing the plant / equipment
- Moving the operation away from sensitive receptors
- Rescheduling the activity
- Erecting noise barriers where other measures are not practical

When noise and vibration monitoring is taking place, all monitors should take into account the background noise and situation when monitoring. External noise and vibration reports to reference to this fact also.

The incident will be logged in the Incident Register if levels have been breached and background noise was deemed not a factor at the time of the occurrence.

8.4. Air pollution control

The main types of air pollution that will result from the works are dust and exhaust emissions from combustion engines, and plant machinery and vehicles. Activities with the potential to produce to dust are:

- Plant and vehicle movement
- Bulk materials handling
- Stockpiles
- Vehicle movement off site
- Include any additional sources

8.4.1. Dust minimisation plan

Dust will be minimised on site through the implementation of the following control measures developed in accordance with the Procedure EP-08 Air Pollution Control:

The site will use a water bowers to dampen site roads during dry conditions.

Water suppression will be used at source to reduce the amount of nuisance dust becoming airborne.

8.4.2. Other air quality control measures

- Exhaust emissions where practical will be minimised by ensuring that all plant, equipment and vehicles are in good working order and regularly serviced to ensure efficient running, by using the smallest engine-sized plant and equipment suitable for the task and by ensuring that engines are not left idling unnecessarily.
- Burning of materials on site will not be permitted.

8.4.3. Dust monitoring

Dust Monitoring will be carried out visually by the site team during the course of the working day.

8.5. Habitat (Flora & Fauna) Protection

Generally ecological mitigation measures are incorporated into the project design and the requirement during the construction stage is to ensure that all mitigations are fully implemented. Additional measures may be implemented during construction to limit additional habitat and fauna disturbance outside the area of works as listed below.

All work activities will comply with the Environmental Protection Agency Act 1992 and Wildlife Act 1976 and amendments 2000 to 2010 and the European Communities (Birds and Natural Habitats) Regulations 2011.

8.5.1. Construction mitigation measures

Control measures will be implemented in accordance with EP-12 Habitat, Flora and Fauna Protection *and the following site specific measures*:

An Ecologist to be egaged for works prior to commencing on site.

No nightitme construction works will take place.

Scrub clearance and tree felling will take lace outside of the bird nesting season which is from 1st March -30th August inclusive.

Noisereduction measures will include:

Locate plant known to emit noise in one direction away from sensitive receivers.

Ensure plant & equipment is well maintained and lubricated.

Prevent machine idling.

Start up plant sequentially

Plan noisy activities to minimise effects on sensitive receivers.

Plant selection to minimise effects on sensitive receivers.

8.5.2. Fish and Fisheries Habitat Mitigation Measures

Refer to the mitigation measures in section 8.1 for water pollution.

Additional measure to mitigate potential pollution to fish and fisheries habitat are as follows:

Refuelling of all plant and machinery will be carried out with bunds in place.

Drip trays will be in place for all re-fueling and storage of liquids/ fuels.

Pumping of any water will be done via permit system.

All works undertaken to existing watercourses to include any ecological requirements and advice of IFI.

8.5.3. Bats

Mitigation for bats will follow:

Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2005a);

• Guidelines for the treatment of bats during the construction of National Road Schemes (NRA, 2005b); and

• NPWS Irish Wildlife Manuals, No. 28: Bat Mitigation Guidelines for Ireland – V2 (Marnell et al., 2022).

If felling trees with bat roosting potential, trees will be inspected fo the presence of bats and/or other bat activity by a suitably qualified bat ecologist during daylight hours and night time using a bat detector.

Where examination of the tree has shown that bats have not emerged or returned to tree, felling may proceed the following day. Should a delay in felling be encountered, resurveying is required.

In areas where bat activity has been recorded, tree-felling must not be conducted in June to early August. Note there are no trees that would be considered as obviously of value as roost habitat. As such, any vegetation and tree removal should be carried out during winter (December to February) to avoid impacts on bats, corresponding to a time when even best bat roost habitat recorded on site would be highly unlikely to be used as winter roosts. Winter hibernation roosts are generally restricted to places that are sheltered from extremes of temperature (Marnell et al., 2022) and trees present on site are deemed unlikely to be mature enough to provide appropriate winter roosting habitat on the basis of the habitat suitability survey carried out on-site.

It is recommended that any trees on site with ivy should be dropped to the ground as gently as possible and left on the ground for a period of 24hrs post felling under the supervision of the ECoW. This soft felling approach will give any bats, if present, the opportunity to vacate.

8.6. Waste management (including hazardous waste)

A Waste Management Plan will be established and the waste management measures for the Project are detailed in a separate document, which includes:

- Waste management targets
- The potential waste materials produced during the project
- Waste handling procedures
- Waste Permits required
- Waste reuse, recycling and disposal techniques
- A map showing designated waste handling areas.

The Waste Management Plan also covers the handling and disposal of hazardous wastes such as asbestos, fuels and used absorbent materials.

With regard to potential nuisance from temporary site offices and canteen, the following measures will be observed:

- Site offices will be maintained in a tidy condition.
- Litter will be cleaned up daily, particularly around skip bins, in accordance with EP-19 Litter Management.

8.7. Hazardous materials handling & storage

During the works there will be a requirement for the use of hazardous substances, including but not limited to:

- Fuel oil
- Diesel
- Hydraulic oil
- Shuttering oil
- Liquid cement
- Concrete curing agent.

The management of such substances will be carried out in accordance with the procedures for:

- Bulk Fuel and Oil Storage (EP-13)
- Storage and Handling of Hazardous Substances (EP-14)
- Containing and Cleaning Up Spills (EP-15).

All chemicals not covered by EP13, EP14 and EP15 will be managed in accordance with the requirements of the relevant safety data sheet (SDS) and the Health and Safety Plan.

- Hazardous materials are kept in lockable stores located in the main compound. Spill kits are also kept at these locations. Any hazardous materials must be returned to the stores at the end of each day and not left on site
- Oil and fuel will be stored in bunded areas and will be stored well away from any water discharge point or, where not possible, the discharge point will be adequately protected to prevent spills from entering
- Diesel pumps, generators or similar will be placed on impervious drip trays to capture minor spills and leaks and located at least 10m from any water discharge point
- Tools and equipment will not be washed in or near any watercourses and if undertaken on site wash water will be directed to appropriate retention controls and not allowed to directly enter any watercourse.

Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access and provided with spill containment. Fuelling and lubrication of equipment will not be carried out in the vicinity of water discharge points. Waste oils and hydraulic fluids will be collected in leak-proof containers and transported off-site for disposal or recycling at appropriately licensed facilities.

8.8. Vermin control

Control measures associated with vermin are as follows:

Rentokil have been engaged to carry out Monthly site visits or as required.

All waste will be controlled by the site team.

8.9. Landscape

Landscape measures will be implemented in accordance with the Landscape Design required by the contract, to be prepared by the Designer.

8.10. Archaeology

N/A

9. MANAGEMENT REVIEW

The implementation of the EMP is reviewed monthly on site at the internal site meetings. These meetings are attended by site management and by personnel responsible for the implementation of the EMP. During the meeting all aspects of the environmental management are considered, including:

- Upcoming work
- Environments risks foreseen
- Control measures for the protection of the environment
- Internal and external audit results
- Inspection and monitoring results;
- Environmental alerts and bulletins
- Any issues raised by site staff or in relation to environmental management
- Site goals and targets
- Control measures for protection of the environment
- Any other significant issues.

Changes are made to the on-site management as required to achieve a continual improvement in environmental performance.

Environmental issues will be brought to the attention of the workforce through toolbox talks and through the Monthly HSE Meeting.

The EMP itself shall be reviewed at least every six months by the Site Management Team to ensure that it continues to be adequate and effective and changes made as required. Any changes shall be made by the Site HSE Officer and a new revision of the EMP issued to all personnel on the circulation list on page 1 of this document.

10. TRAINING AND COMPETENCE

The environmental management requirements shall be communicated to all staff and contractors at the HSE induction. All employees and contractors are required to undertake an online induction and a site specific induction prior to conducting any work on site (for further details refer to the Health and Safety Plan) and employees shall be made aware of their responsibilities in accordance with this management plan. A record of inductions shall be kept by the Safety, Health & Environmental Officer.

Toolbox talks will be conducted with relevant employees on various aspects of the environmental management plan, activity control measures and environmental procedures. Three toolbox talks on environmental, sustainability or waste issues must be conducted per quarter.

Toolbox talks shall be conducted by the Site Management Team. The schedule for toolbox talks shall be at the discretion of the Site Management Team and additional toolbox talks will be given in response to complaints, or where the particular environmental risks have been identified.

Table 9:Recommended toolbox talks

Toolbox talk topic	Reference material	When*	Recipients
Environmental Management	Environmental Policy, EMP, Environmental Procedures Manual	Commencement of site activities	All site crews
TBT 01	Hazardous Substances	Regular Intervals	All site crews
TBT 02	Environmental Awareness	Regular Intervals	All site crews
TBT 03	Managing Waste	Regular Intervals	All site crews
TBT 04	Spill Control	Regular Intervals	All site crews
TBT 05	Waste Pollution Prevention (Fuel & Oil)	Regular Intervals	All site crews
TBT 06	Silt Management	Regular Intervals	All site crews
TBT 07	Fire	Regular Intervals	All site crews
TBT 08	Storage of Hazardous Waste on Site	Regular Intervals	All site crews
TBT 09	Japanese Knotweed	Regular Intervals	All site crews
TBT 10	Chemical & Fuel on site	Regular Intervals	All site crews
TBT 11	Trees	Regular Intervals	All site crews
TBT 12	Water on Construction Sites	Regular Intervals	All site crews
TBT 13	Dust and Air Quality	Regular Intervals	All site crews
TBT 14	Noise and Vibration	Regular Intervals	All site crews
TBT 15	Archaeology	Regular Intervals	All site crews
TBT 16	Working in previous developed areas	Regular Intervals	All site crews
TBT 17	Pumping and over pumping	Regular Intervals	All site crews

Toolbox talk topic	Reference material	When*	Recipients
TBT 18	Water pollution - cement and concrete	Regular Intervals	All site crews
TBT 19	Material handling and housekeeping	Regular Intervals	All site crews
TBT 20	Washing down plant and equipment	Regular Intervals	All site crews
TBT 21	Energy conservation - electricity and fuel	Regular Intervals	All site crews
TBT 22	Bentonite	Regular Intervals	All site crews
TBT 23	Be a good neighbour	Regular Intervals	All site crews
TBT 24	Sustainability	Regular Intervals	All site crews
TBT 25	Eco driving	Regular Intervals	All site crews
TBT 26	Fuel efficiency	Regular Intervals	All site crews
TBT 27	Material handling and storage	Regular Intervals	All site crews
TBT 28	Segregation of waste	Regular Intervals	All site crews
TBT 29	Storage of waste	Regular Intervals	All site crews
TBT 30	Energy efficiency	Regular Intervals	All site crews
TBT 31	Void space	Regular Intervals	All site crews
TBT 32	Waste hierarchy	Regular Intervals	All site crews

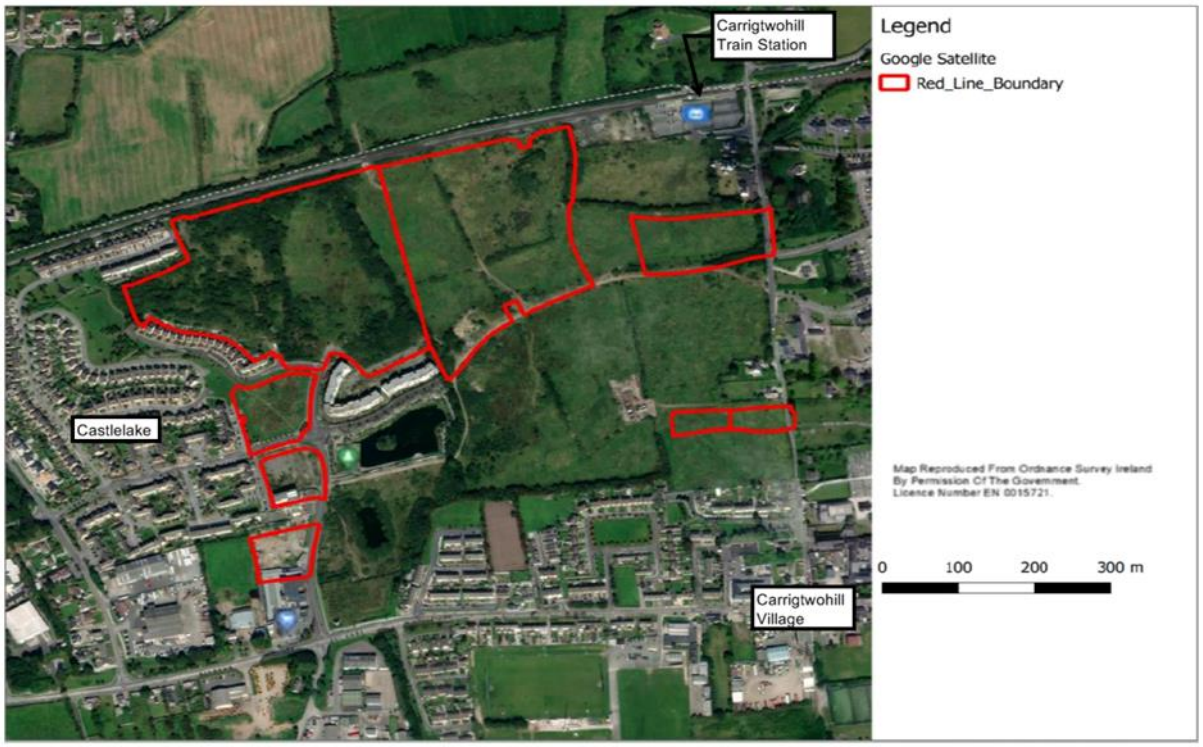
Appendix 1: Table of requirements for ISO14001:2015

Ref	ISO14001:2015	EMP	Section
5.2	Environmental Policy	Company Environmental Policy	Appendix 5
6.1.2	Environmental aspects	Environmental planning, aspects and control Site Environmental Risk Assessment	5 5.1
6.1.3	Compliance obligations	Relevant Statutory Provisions	6.5
		Contract Requirements/ ERA	Appendix 2 & 3
6.2 6.2.1 6.2.2	Environmental objectives and planning to achieve them	Environmental objectives and targets	7
5.3	Organizational roles, responsibilities and authorities	Organisation & Responsibilities	2.1 2.3
7.2 7.3	Competence and awareness	Training and competence	10
7.4	Communication	Environmental Management Arrangements Communication	3 2.2
7.5.3	Control of documented information	Control of Documents	6.7
8.1	Operational planning and control	Environmental Control Measures	8
8.2	Emergency preparedness and response	Summary of emergency procedure	4
9.1	Monitoring, measurement, analysis and evaluation	Environmental management	3.1
9.1.2	Evaluation of compliance	Environmental compliance requirements	6
10.2	Nonconformity and corrective action	Environmental incidents	3.2.2
9.2	Internal audit	Environmental management	3.1
9.3	Management review	Management Review	9

Appendix 2: Table of contractual requirements for environmental management

EMP Section	Section/ Clause

Appendix 3: Site map/s



Appendix 4: Environmental policy

The organisation promotes a responsible and proactive approach to environmental and waste management at every level of the business and on all sites of operation.

BAM Building recognise that business aims must be balanced against environmental considerations. We are committed to continually improving our environmental performance and managing our operations to minimise potentially adverse impacts on the environment.

Specifically, where it is within the organisation's control or influence, BAM Building will:

Identify the significant environmental aspects of our activities by assessing their potential impact on the environment.

Based on our significant environmental aspects, set specific objectives and targets, against which we shall monitor and review our performance.

Comply with legal and other requirements that are applicable to our activities and relevant to the environmental aspects of the business.

Develop management processes and procedures that prevent pollution, protect native species and habitat, minimise waste generation, promote recycling and the use of recyclable materials, and maximise the efficient use of material and energy resources. In order to enable Ireland to fully decarbonise the construction sector, BAM commit to encouraging the use of EPD's.

Implement strategies to communicate our environmental commitments and requirements to employees, customers, suppliers, subcontractors and other interested parties.

Provide training and support to employees, so they understand and can fulfil their responsibilities with regard to environmental impact and performance.

It is the individual responsibility of all persons working for or on behalf of BAM Building to support and apply the Environmental Policy and Environmental Management System as it pertains to their activities.

T. Cullinane , CEO
Date: May 2021

Environmental Emergency Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork

Revisions

Environmental Dept. Revision No: 01 27th May 22			
Reason for Issue:	Planning Permission		**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim Finn	O Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim Finn	BAM	Site
4	Site Agent	TBC	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

TABLE OF CONTENTS

Tables

1. INTRODUCTION

This Environmental Emergency Plan (EEP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Project Director, Project Manager and Site Teams to fulfil the requirements of the Plan.

1.1. Purpose of the plan

This EEP describes how BAM will manage environmental emergencies for Castlelake SHD.

This EEP has been developed within the framework of the BAM Contractors EMS. The BAM Contractors EMS is certified to ISO 14001:2015.

This Plan will:

- Identify the emergency processes required to take control of an emergency
- Maintain a state of preparedness to prevent or reduce injury to personnel or the environmental as a result of an emergency that may occur on site or in an office
- Minimise property loss or damage to the environment.

This procedure will be updated when additional hazards are identified and controls of the same are required

This plan will be sent to all subcontractors prior to commencing on site.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

- Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).

- Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
- Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
- Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
- All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

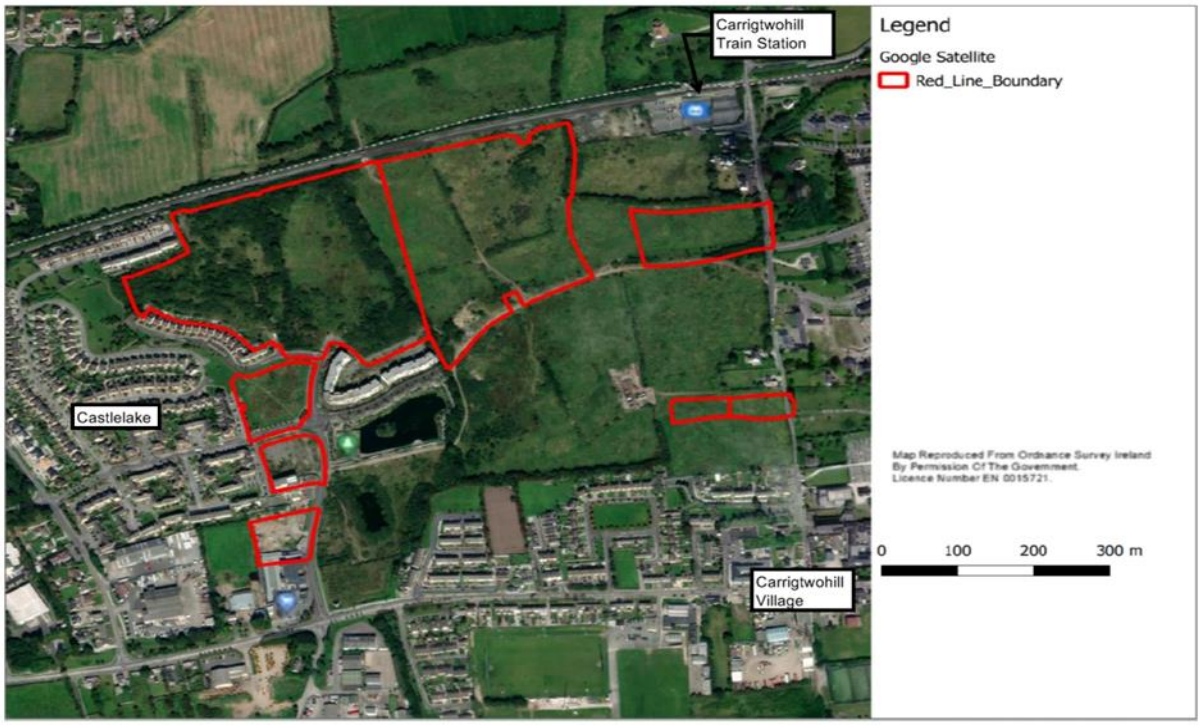
1.3. Site location

Castlelake SHD, Carrigtwohill, Co. Cork

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



1.4. Working hours

Working hours are in accordance with the Planning Conditions and Environmental Legislation in that we will operate between Monday to Friday 08:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs.

1.5. Plan objectives

The objective of this EEP is to seek to enhance the protection of the environment and human health in environmental emergency situations by promoting prevention and ensuring preparedness, response and recovery.

1.6. Update and review

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site. Environmental aspects (water/chemicals/fire)

1.7. Water (surface and groundwater) controls

Water pollution or sediment release will be treated as follows:

- Measures described in *EP-23 Emergency Procedure for Sediment Release* will be implemented

- *EP-10 Surface Water Control* and *EP-15 Containing & Cleaning Up Spills* will be adhered to
- All leaks or flows will be contained immediately
- Where the risk of flooding may arise, additional steps will be taken to ensure all filtration methods or silt ponds are checked regularly to ensure no build-up of water / materials increases the risk of flooding and possible contamination
- Environmental Incident reported to the HSE Department and all incidents must be submitted on the BIM Incident Tracking system within seven days.

1.8. Chemical/Hazardous substance controls

Chemical / hazardous substance spills should be treated with great care:

- Person discovering the spill must raise the alarm immediately
- Main environmental controller must be informed and will then decide if the spill/leak can be dealt with internally or whether the emergency services must be called (**112 or 999**)
- Only minor spills will be dealt with using absorbent material available
- The area must be evacuated, and this procedure carried out promptly
- If a chemical or hazardous substance has come in contact with a person you can contact the NATIONAL POISON CENTRE ON (01) 8092166 for advice on first aid treatment
- Environmental Incident reported to HSE Department, and all incidents must be submitted on the BIM Incident Tracking system within seven days.

1.9. Fire

In the event of a fire, the following emergency steps must be followed:

- Persons discovering a fire must raise the alarm immediately. Immediately contact a member of the BAM Management Team
- The offices or area effected must be evacuated
- Only minor fires will be dealt with, if safe to do so, using fire extinguishers or fire blankets
- In cases of major fires or chemical fires, the emergency services must be contacted (***112 or 999***)
- If tackling a minor fire, ensure there is enough suitable firefighting equipment in place
- Employees must be trained to use firefighting equipment
- Redundant fire water must not be allowed to enter surface water areas (*connected sewerage systems must be protected from our construction site run off as per environmental procedures*)
- Fire drills must be carried out on site and in offices every six months.

Please see below for the following types of extinguishers and their uses:

Table 1: Extinguishers

Type	Use
Water fire extinguishers	Cloth, paper and wood fires only
Dry powder	Most fires including electrical fires
CO_2	Electrical fires and flammable liquids
Foam	Class A fires such as paper, wood and cloth

2. SAFETY AND SPILL CONTROL PROCESSES

2.1. Personnel safety

Personnel safety measures with regards to spills includes:

- Immediately alerting area occupants to evacuate area if necessary
- If a volatile, flammable material has been spilled, switch off or remove any sources of ignition close to the spill. Ventilate the area if indoors
- Put on personnel protective equipment, as appropriate to the substance spilled. As a minimum, gloves and goggles must be worn. Gloves and goggles will be available in the spill kit (*replenish spill kits when required*)
- Consider the need for respiratory protection. Never enter a contaminated atmosphere without training or use a respirator without training.

2.2. Spill control and clean up

Spill control and clean up measures include:

- Identify the source of the pollutant and, if possible and safe to do so, stop the flow
- Get a spill kit(s) and apply absorbent materials appropriate to the spill type. Ensure that waste containers are available in which to place used absorbents
- Prevent the spill from spreading and contain it in as small an area as possible, using absorbent sausages, sand, earth or polythene to damn the flow. Divert any flow away from drains, sewers or watercourses or prevent pollutants from entering drains by placing sausages and/or polythene around or over the opening
- If any pollutant has entered water system, absorbent booms must be positioned on the water. If there is not enough flow in the water to push the pollutant into the boom you may need to apply absorbent pads to the surface to soak up the pollutant
- If an oil interceptor is located nearby, any oil or oil/water mixture may be pumped into this, as long as the capacity of the interceptor is not exceeded, and we have permissions
- Place used absorbent pads and shovel contaminated sand/earth/absorbent granules into sacks or containers. Store large volumes of contaminated soil/material in a contained impervious area, such as a plastic-lined bund
- Used absorbent pads / sausages / booms that are not fully laden with pollutant (*i.e. not dripping when they are held up*) may be stored in appropriate containers for reuse. Any such containers must be sealed and clearly labelled as to their contents and stored in a bunded area.

3. ENVIRONMENTAL INCIDENTS/DEFINITIONS

3.1. Environmental incident definitions

Major environmental incident: any situation which has resulted in significant pollution requiring high level of resources for response and remedy and must therefore be reported to Site/Company Management, the Client and/or any relevant statutory authority.

Minor environmental incident: any situation which has resulted in environmental pollution which requires minimal action to aid recovery from Site/Company Management. Non-reportable to any relevant statutory authority.

Main environmental incident controller: takes responsibility for control of the emergency, contacting emergency services and maintains a continuous review of possible developments (*has received fire extinguisher training and spill control advice as a minimum*).

An environmental incident may include but it not limited to:

- Spillage of hazardous materials (as defined by the Waste Management Acts,)
- A breach of any specified environmental limits as detailed in contractual documents or EIS documents (noise, vibration, air)
- Uncovering contaminated land
- Any spillage which cannot be rapidly contained and controlled, these include diesel, oil spills etc
- Inappropriate disposal of waste
- Runoff of sediment-laden or otherwise polluted water to a waterway
- Spills of fuel, oil or hazardous substances into water or a waterway
- Hazardous waste mixed with non-hazardous waste or stored in an inappropriate manner
- Mixing of hazardous wastes
- Concrete waste/washings disposed in a non-designated area
- Working within a protected area.

3.2. Emergency response procedure process

In the event of a **major** *or* **minor** environmental incident occurring, BAM will immediately:

- Clean up spill as per Section 3.2 of this Plan (*if applicable*)
- Isolate the source of any such emission / pollution
- Identify and execute measures to prevent / minimise the emissions / malfunction and the effects thereof
- Evaluate the environmental pollution, if any, caused by the incident
- Corrective actions taken to remedy the situation

- Carry out an investigation to identify the nature, source and cause of the incident and any emission arising there from
- All related information will be gathered concerning the environmental incident and photographs will be taken
- All relevant parties will be spoken with regarding this matter
- When all the information has been gathered, it will be added to the BIM Incident Tracking system. If any further actions have to be taken, these will be agreed, and timescales set.
- All incidents must be submitted on the BIM Incident Tracking system within 7 days.
- All environmental incidents that are added to the Incident Tracking System are reviewed by the HSE department prior to final approval and are included on the monthly 'Loss Events Report'.

This EEP will be communicated to all BAM Personnel and will be reviewed and updated (*where necessary*) on a 6-monthly basis (unless significant change) in conjunction with the EMP and WMP. A spill response drill will also be completed on each site by relevant personnel.

4. REFERENCES

EP-23 Emergency Response for sediment release to water

EP-24 Complaints and Incidents Procedure

EP-15 Containing and Cleaning Up Spills

SP-13 Fire Safety