



OUTLINE CONSTRUCTION & ENVIRONMENTAL MANAGEMENT PLAN

Proposed Regeneration Scheme, Dublin Street North,
Monaghan

Client: Carlin Planning Ltd

Project Reference: P676-8

Issue Date: February 2025

Table of Contents

1.0	INTRODUCTION	1
1.1	Overview	1
1.2	Purpose of the oCEMP	1
1.3	Roles and Responsibilities	1
1.4	Legislation and Guidance Requirements	2
2.0	PROJECT OVERVIEW	3
2.1	Pre-Construction Surveys & Conditions	4
2.2	Demolition, Enabling Works & Construction Phase	4
2.3	Working Programme & Working Hours	5
2.4	Construction Traffic and Haul Routes	5
2.5	Construction Compound	5
2.6	Equipment & Plant Machinery	6
3.0	CONTROL MEASURES	6
3.1	General Control Measures	6
3.2	Vegetation Clearance & IAS's	7
3.3	Waste management	11
3.4	Drainage & Surface Water Management	13
3.5	Sediment Control	14
3.6	Fuel Management	15
3.7	Management of Concrete and Bituminous Material	16
3.8	Noise & Vibration Control Measures	17
3.9	Dust & Air Quality Control Measures	19
3.10	Lighting	22
3.11	Cultural Heritage Specific Mitigation	23
3.12	Architectural Heritage Specific Mitigation	24
3.13	Townscape & Visual Impact Specific Mitigation	24
3.14	Traffic & Transport Specific Mitigation	25
4.0	ENVIRONMENTAL PERFORMANCE INDICATORS	25
5.0	RECORD KEEPING	25
6.0	RESPONSE PROCEDURE / CORRECTIVE ACTION	26
6.1	Corrective & Preventative Action	26
7.0	TRAINING	26
8.0	CEMP	27

1.0 INTRODUCTION

1.1 Overview

Layde Consulting was commissioned by Carlin Planning Ltd to prepare an Outline Construction Environmental Management Plan (oCEMP) for a proposed Regeneration Scheme within Monaghan town, extending to lands at the rear of Dublin Street North.

The purpose of this oCEMP is to document and describe the main activities that will be undertaken to facilitate the project and to provide a framework of environmental protection measures that will be implemented prior to commencement of, and throughout the duration of the proposed development.

1.2 Purpose of the oCEMP

The proposed construction and demolition works will be undertaken by a Contractor appointed by Monaghan County Council. This oCEMP will be provided to the appointed Contractor prior to the commencement of works and will form the basis of the Contractor's CEMP and Method Statements, which the appointed Contractor will be required to develop and prepare for approval by Monaghan County Council prior to commencement of any works. The Contractor's CEMP and Method Statements will set out the approach and methodology which they will follow in scheduling and undertaking the work. The CEMP will detail the control measures in relation to environmental protection associated with the activities associated with the construction and demolition processes, and any processes which may arise as a result of the development.

It is the responsibility of Monaghan County Council to ensure that the requirements of this oCEMP and any requirements associated with the Contractor's Method Statements and detailed CEMP are implemented in full.

This document is intended to be a working document and should be routinely updated by the appointed contractor in order to form a detailed CEMP which will contain site specific construction and environmental management and mitigation techniques. The detailed CEMP should be updated prior to any pre-construction surveys or conditions of planning, and also prior to the commencement of site works. The document will remain live for the duration of the project, inclusive of the operational phase (i.e. for maintenance works).

1.3 Roles and Responsibilities

This initial issue of the oCEMP identifies the key roles for the construction works. The appointed contractor will produce a detailed CEMP which will set out the roles and responsibilities (including named individuals) and an organogram of the team structure.

1.3.1 Primary Contractor

Unless agreed otherwise by Monaghan County Council, the primary contractor will ensure that the overall CEMP is implemented by the construction team, and any subcontractors in their employment.

1.3.2 Site Manager

The Site Manager will be responsible for the day to day running of the site and will direct and oversee the activities of contractor staff and any subcontractors under the Contractor's control throughout the works. The Site Manager will be responsible for programming of the works and will consult regularly with the Employer and will maintain site safety.

1.3.3 Contractor's Environmental Clerk of Works

The Contractor's Environmental Clerk of Works (EnCoW) will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The EnCoW will be delegated sufficient powers under the construction contract so that they will be able to instruct works to stop and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultations with environmental bodies/stakeholders. The EnCoW will be responsible for ensuring that all control measures outlined within this oCEMP and detailed CEMP are fulfilled and in adherence with applicable standards and legislation.

1.4 Legislation and Guidance Requirements

The CEMP summaries the requirements from legislation and Codes of Practice which apply to the works being undertaken. An example non-exhaustive list of such requirements is provided below

- Wildlife Act 1976 – 2021, as amended;
- Birds and Natural Habitats Regulations 2011 (S. I. No. 477 of 2011), as amended;
- Heritage Act 2018 (no. 15 of 2018), Part 3
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, July 2006)
- Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016)
- Safety, Health, and Welfare at Work Act, 2005
- Safety, Health, and Welfare at Work (Construction) Regulations, 2013
- Safety, Health, and Welfare at Work (General Application) Regulations 2007 – 2016, SI No. 229
- Safety, Health, and Welfare at Work (Confined Spaces) Regulations, 2001
- European Communities (Good Agricultural Practice for Protection of Waters) (Amendment) Regulations, 2014
- The European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (SI No.272 of 2009), as amended
- European Communities (Quality of Shellfish Waters) Regulations 2006 (SI No 268 of 2006)
- The EU Floods Directive 2007/60/EC;
- European Communities (Groundwater) Regulations, 2010 (as amended)
- S.I. 722 of 2003, European Communities (Water Policy) Regulations, as amended;
- S.I. 350 of 2014, European Union (Water Policy) Regulations 2014;
- Planning and Development Act 2000, as amended;
- Planning and Development Regulations 2001, as amended;
- Inland Fisheries Ireland, "Guidelines on protection of fisheries during construction works in and adjacent to waters" (2016) IFI;
- Department of Housing, Local Government and Heritage, "Nature-based solutions for the management of rainwater and surface water run-off in urban areas";
- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001); and

- Good practice guidelines from CIRIA's guidance document (C768 – Guidance on the Construction of SuDS) (2017).
- CIRIA C648 Control of water pollution from linear construction projects Technical Guidance (CIRIA 2006)
- British Standard BS4142:2014+A1:2019, “Methods for Rating and Assessing Industrial and Commercial Sound”;
- British Standard BS8233:2014, “Sound Insulation and Noise Reduction for Buildings”;
- British Standard BS5228-1:2009+A1:2014, “Code of Practice of Noise and Vibration Control on Construction and Open Sites – Noise”;
- World Health Organisation (WHO), “Guidelines for Community Noise” (1999);
- NRA, “Good Practice Guidance for the Treatment of Noise during the planning of National Road Schemes” (2014);
- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 7, LA 111, “Noise and Vibration” – Revision 2 (May 2020);
- British Standards BS7445-1:2003, “Description and Measurement of Environmental Noise – Part 1: Guide to Quantities and Procedures”;
- British Standards BS6472-1:2008, “Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting”;
- British Standard BS7385-2:1993, “Evaluation and Measurement for Vibration in Buildings Part 2: Guide to Damage Levels from Ground borne Vibration”;
- British Standard BS5228-2:2009+A1:2014, “Code of Practice of Noise and Vibration Control on Construction and Open Sites – Vibration”;
- IAQM “Guidance on the assessment of dust from demolition and construction”, v1.1 (2016).

2.0 PROJECT OVERVIEW

The proposed development area (herein termed the ‘site’) incorporates lands to the rear of Dublin Street North, Monaghan (see Figure 1), and comprises of a mix of urbanised areas, external residential amenity areas, commercial land, and derelict lands comprising of scrub and treelines along St. Davnet’s Row and the Old Infirmary area. Under the development proposals it is intended to regenerate the site by demolishing the existing buildings within the site, and constructing a new public access road, car parking and event space, and also enabling the provision of future development plots for commercial and residential uses. As a result, the development proposals also include the removal of vegetation and ground cover, as required, and grading cut/fill works. The proposals also include all necessary infrastructure provisions such as drainage and utilities, paving, surfacing and landscaping.

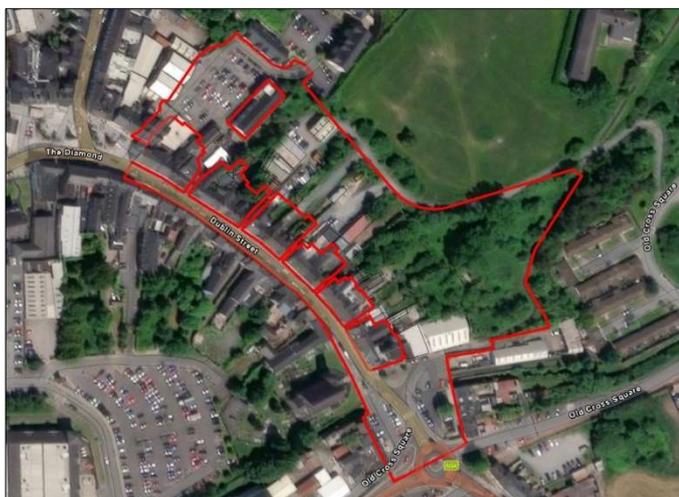


Figure 1- Proposed development area, lands to the rear of Dublin Street North

2.1 Pre-Construction Surveys & Conditions

As part of the planning and EIA process, a number of conditions are likely to be imposed on the site, which may include pre-construction or commencement surveys and works, and should be carried out prior to the commencement of enabling works, demolition or construction phases. This is likely to involve the following (but not limited to):

- Pre-commencement surveys for bats, flora and fauna;
- Pre-commencement surveys for Invasive Alien Species (IAS's) and updating of the Invasive Species Management Plan (ISMP);
- Pre-construction Baseline noise monitoring for construction activities;
- Updating of plans and schedules of works, including revisions to Noise Impact Assessments, Air Quality Impact Assessment and Ecological Assessments, as required;
- Permissions and grants to commence works, and review of submissions by the Council.

2.1.1 Pre-Commencement Bat Surveys

Upon gaining planning and ownership of the land and site area, and prior to commencing the demolition or construction phases of the development, it is recommended that bat activity surveys are carried out for all buildings which are intended to be demolished as part of the development. This should include internal and external inspections, re-surveys for previously assessed buildings if more than one year has passed since the previous surveys were carried out, and bat activity surveys should be carried out for buildings which have not yet been assessed due to site access constraints. In addition, bat roost surveys and activity surveys should be carried out for any tree structures (such as the two Ash trees) prior to removal or felling.

In the event that roosting bats are identified during the pre-commencement surveys, then suitable mitigation should be developed to either retain the roost structure, or to provide a suitable alternative roost feature through appropriate design, and under licence by NPWS.

2.1.2 Breeding Birds

In order to avoid any significant impacts upon nesting birds during the demolition and construction phases, it is recommended that these works should take place during the period 1st September to 28th February which is outside the breeding season for bird species which are likely to breed on the site.

In the event that demolition or construction works is necessary during the breeding season period, then it is recommended that a pre-works survey is carried out by a suitably qualified ecologist in order to identify any potential impacts on nesting birds.

2.2 Demolition, Enabling Works & Construction Phase

The development proposals intend to demolish all existing buildings inside the application area, some of which have been colonised with non-native plant species. In order to facilitate enabling and demolition works, ground clearance of vegetation will be required, which includes the felling of trees and scrub, and will also likely include the removal / disturbance of non-native and IAS's. The demolition phase will also require the haulage of materials offsite for disposal, therefore works associated with the demolition and ground clearance / enabling works phase may have the potential to disturb and spread invasive alien species (IAS) within the site area.

The demolition and enabling works will involve the demolition of buildings and removal of any foundation or floor slab structures, and the excavation of ground levels down to the required

topographical grades. Demolition works will therefore require the haulage of bulk materials offsite for disposal / reuse.

Construction works will involve the excavation of soils and subsoil surfaces as part of the cut / fill grading processes, with excess spoil materials being exported from site, and new materials being imported. The construction phase will require the installation of haul routes within the site, wheel wash and welfare facilities, and installation of a construction compound for plant equipment etc., along with any infrastructure required in order to carry out the construction phase.

2.3 Working Programme & Working Hours

The commencement date is subject to approval by Monaghan County Council, following permission of planning. Once the commencement date is confirmed, then the CEMP will be updated accordingly.

The schedule of works have not been confirmed, given that the proposals are still within the application stage. Once a contractor has been appointed for works and the schedule confirmed, then the CEMP will be updated accordingly.

Operating hours are anticipated to be restricted to normal construction working periods, however once the construction operating hours have been confirmed then the CEMP will be updated accordingly.

2.4 Construction Traffic and Haul Routes

A detailed Traffic Management Plan (TMP) will be prepared for the proposed development by the appointed contractor(s) prior to construction. Throughout the construction phase of the project access will need to be maintained to the following areas:

- Local road network
- Site access roads
- Emergency Services Construction traffic will include:
 - HGVs importing construction materials including concrete, pre-cast culverts and piping
 - HGVs exporting waste/spoil materials
 - HGVs delivering plant and fuel
 - Mobile Cranes
- Traffic associated with on-site construction personnel

Traffic flow may need to be managed for sections of The Diamond, Dublin Street and Old Cross Square may need to be closed to traffic at times to facilitate the works. Prior to commencing the works, a detailed traffic management system will be developed in order to minimise disruption caused by the works. Traffic and pedestrian diversions will be put in place, wherever necessary. Where feasible, access to all properties will be maintained.

2.5 Construction Compound

Although the specific construction details are not known at this stage, given that the proposals are still within the planning phase, it is envisaged that a construction compound will be required. This typically requires a suitably surfaced contractor's temporary construction compound and laydown area will be required for the duration of the site works on the proposed development site.

The construction compound is likely to consist of temporary site offices, equipment storage and construction staff welfare facilities, as well as car parking areas for staff and visitors. Container

storage units should be required for holding tools and materials. The compound should be fenced with chain-link fencing on wooden posts and have a lockable gate.

A potable water supply should be required for the duration of the works. Any foul sewage from the temporary facilities should be routed to appropriately designed storage tanks or mains sewerage system for receiving and storing sewage with no outlet. The tanks should be sized to suit the expected use and installed in a location remote from any water courses. Contents and residues should be regularly emptied by a competent operator for safe disposal to an approved treatment works. The temporary compound should be used as a secure storage area for construction materials, waste materials and also contain temporary site accommodation units to provide welfare facilities for site personnel. Facilities should include offices, meeting rooms, a canteen and a drying room.

If required, the temporary compound should be constructed early in the project in order to provide site offices and accommodation for staff and for the delivery of materials. Any surface water management, bunding, waste management measures etc should also be put in place at the outset. The compound is likely to be in place for the duration of the construction phase and will be removed once commissioning is complete.

2.6 Equipment & Plant Machinery

Details relating to plant machinery and site equipment are not known at this stage. Once a contractor has been appointed, and a works schedule developed, then the CEMP should be updated to include all plant specifications and equipment details.

3.0 CONTROL MEASURES

The following sections provide an overview of the control measures that will be implemented prior to commencement and throughout the duration of the proposed works.

3.1 General Control Measures

The following outlines general control measures which should be implemented throughout all phases of the development. Specific control measures are discussed in later sections of this oCEMP:

- Report any signs of pollution or environmental damage to the site foreman no matter how small;
- Report any spills, incidents or near misses that occur on site immediately to the site foreman;
- Refuel only in designated areas with spill kits available;
- All waste must be stored in the designated site waste management areas;
- Do not throw litter, all waste must be sent to site waste management contractor;
- Do not divert plant or machinery outside the authorised working boundaries of the site;
- The Contractor will ensure ongoing compliance with the recognised Environmental Management System Standard to which it is registered (e.g. EN ISO 14001 or equivalent European Standards);
- The Contractor will develop Environmental Procedures to control the potential impacts from the construction phase of the development. These procedures will be made available in the main site office and at the main Environment, Health and Safety information points on site;
- All personnel will be familiar with the Environmental Policy which will be made available in the main Contractor office;

- An emergency contact list will be prepared and made available to all construction staff employed. The contact list will be displayed prominently on site as well as at suitable locations where construction activity is being carried out around working areas. The contact list will include key environmental representatives that may need to be contacted in the event of an incident.

3.2 Vegetation Clearance & IAS's

Enabling and demolition works will require the clearance of vegetation throughout portions of the site, to include areas which are affected by IAS's. Therefore, the following control should be implemented in order to effectively manage vegetation material removed from the site, and to prevent the spread of IAS's. It should be noted that at all times throughout the enabling works, demolition and construction phases, the ISMP should be adhered to.

- Only essential areas of vegetation removal and tree clearance will be carried out, in accordance with the development proposals and permissions granted thereafter;
- Given the potential timeframe lag between the planning and design stage of the project to the site preparation, demolition and construction phase, it is possible that the areas identified with IAS's may have changed spatially from the initial Invasives Species Survey, and new IAS may be found within the project area which was not previously identified within the Invasives Species Survey. Therefore, it is recommended to undertake a pre-construction survey of invasive species prior to demolition and enabling works, and to update the ISMP accordingly;
- The details of the re-survey should provide an approximate area and density of plant species, and a record made of any changes to the findings of the initial Invasive Species Survey;
- Should any species be found that is not included within the ISMP, then the plan should be updated to include control measures and appropriate management or mitigation, as required;
- Personnel are at all times to be mindful of the threat posed by the spread of invasive species and to take all possible precautions to ensure that their actions do not result in the accidental movement of contaminated material;
- All PPE must be cleaned thoroughly before entering the works area and exclusion zones. Similarly, all individuals must thoroughly inspect their clothing and PPE before leaving the site or works area, in order to ensure that seeds, rhizomes, or other plant fragments are not stuck or attached to their clothing;
- Designated wash-down areas should be provided within each works area and lined with appropriate geo-textile materials within each exclusion zone. As a minimum, wash buckets, sole picks and bristled brushes should be provided for each wash-down area. All footwear must be thoroughly cleaned before leaving the exclusion zone or works area;
- Wash-down materials from PPE equipment or machinery should be appropriately contained and removed offsite using the relevant measures outlined within the ISMP;
- All plant machinery which is to be used within an exclusion zone should be clean on arrival to the site and should be stored within a specified site compound or storage area when not in use. The storage area / site compound must be covered by geotextile materials, and any build up of debris should be stored and contained as required within the ISMP;
- Plant equipment used within an exclusion zone should be cleaned within a designated wash-down area before moving from one area of a site to another;
- The number of machines that enter exclusion zones or come into contact with contaminated material should be kept to a minimum;
- Machinery (especially HGVs) should be kept within a designated haulage route, marked by appropriate fencing and signage;

- All plant operating within an exclusion zone should be thoroughly washed within a designated geo-textile lined wash-down area before exiting the exclusion zone, paying particular attention to any part of the machinery or equipment that may have come into contact with an invasive species or contaminated clay e.g. tracks/tyres, buckets, machine arms, wheel arches etc;
- All equipment and machinery must be certified as clean by the Ecological Clerk of Works (ECoW) before they are removed from the exclusion zone;
- Materials or debris generated within the wash-done area should be contained and managed in accordance with the techniques outlined within the ISMP;
- All plant machinery which is to be used within an exclusion zone should be clean on arrival to the site and should be stored within a specified site compound or storage area when not in use. The storage area / site compound must be covered by geotextile materials, and any build up of debris should be stored and contained as required within the ISMP;
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- All plant operating within an exclusion zone should be thoroughly washed within a designated geo-textile lined wash-down area before exiting the exclusion zone, paying particular attention to any part of the machinery or equipment that may have come into contact with an invasive species or contaminated clay e.g. tracks/tyres, buckets, machine arms, wheel arches etc;
- All equipment and machinery must be certified as clean by the Ecological Clerk of Works (ECoW) before they are removed from the exclusion zone;
- Materials or debris generated within the wash-done area should be contained and managed in accordance with the techniques outlined within the ISMP;
- Before commencing site works, the operators or contractor should be in receipt of all necessary licenses required to transport contaminated materials offsite, and waste transfer documentation retained for future inspection. A record of all materials should be kept for offsite disposal, to include as a minimum the volumes of materials, nature and waste classifications, haulage details and which licensed facility the materials were taken to. In addition, a record should be kept for any documentation needed in accordance with waste handling, transfer and disposal licenses;
- When geotextile material is required to be excavated and removed from site, it should be treated and handled in exactly the same way as soils/subsoils contaminated with IAS's;
- If soil or geotextile materials are imported to the site for landscaping, infilling or laying of haulage routes etc, then the contractor should gain documentation from suppliers that the material is free from invasive species;
- Excavation and HGV loading areas should be defined and planned for in advance, with geo-textile materials laid throughout the loading area and haulage route, up to 2m buffer either side;
- Where contaminated material is being loaded or excavated, particular care must be taken in order to ensure that a spillage is avoided at all times;
- In the event that spillages of material occur, either through accidental release or as a result of excavation works, then spilled materials should be cleaned up immediately;
- Wherever possible, haulage and movement of materials should not occur within exclusion zones, unless absolutely necessary as part of the program of works required for the project;
- Only vehicles required for essential works, including site investigation works, will be brought on site and the number of visits minimised as much as practicable;

- Haulage routes and access tracks should be delineated and marked or fenced off, and exclusion fencing must be erected and clearly visible wherever required. All site personnel should be made aware of exclusion zones, and appropriate signage should be installed to the same effect;
- Wash-down areas with the use of power washing and suitable wheel wash facilities should be provided at all exit points from the site, and all plant should be washed thoroughly, with all mud and debris removed prior to leaving the site. Geo-textile material should be laid throughout the wash-down area, and all contaminated materials and debris should be collected and treated for disposal;
- Tracked machines have a high potential for spreading IAS's and contaminated soil materials, therefore particular attention should be paid to thoroughly washing down tracked machines before moving offsite. The cleaned machines should be inspected by a suitably qualified ECoW or trained personnel prior to leaving site;
- Where it is necessary to dispose of materials offsite, then it should be noted that the movement of invasive plant material requires a licence from the National Parks and Wildlife Service (NPWS) under Section 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Therefore, prior to commencing site setup, clearance or construction works, a licence must be obtained from the NPWS in advance.
- Invasive species collected within the site must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation. Where there are small amounts of IAS material (such as small volumes of Knotweed or Himalayan Balsam, including flower heads, seeds, stems, root material or leaves etc) to be removed it may be possible to double bag the material and send it to a licenced waste facility for disposal. Where the amount of material is larger in volume, it will be necessary to haul it from site to a suitably licenced waste facility;
- It should be noted that some invasive species plant material or soil containing residual herbicides may be classified as either 'hazardous waste' or 'non-hazardous waste' under the terms of the Waste Management Acts, and both categories may require special disposal procedures or permissions. Advice should be sought from a suitably qualified waste expert regarding the classification of waste and the suitability of different disposal measures;
- Soil and subsoil materials may be screened for rhizomes and root material, however all soils excavated within affected areas should be treated as contaminated. Any soil or screened materials to be removed offsite should be taken to a licensed facility for disposal;

3.2.1 IAS's: Exclusion Zones

Exclusion zones should be set up around areas affected by IAS's as listed under Invasive Alien Species Regulation (Regulation (EU) 1143/2014) or The European Communities (Birds and Natural Habitats) Regulations 2011 (Statutory Instrument 477/2011) and Amendment 2015 (S.I. No. 355/2015), inclusive of any amendments, in order to avoid the unintentional spreading of IAS's within the site area, or offsite where excavated materials are to be removed. Where exclusion zones are required, then the following should be adhered to

- Exclusion zones must be clearly marked or fenced off, and made easily identifiable to site personnel in order to prevent accidental incursion into the affected area;
- The extent of the exclusion zone should be based on the extent of the affected area where IAS's have been recorded, but should also take into consideration the extent of rhizome or roto system associated with the species. This may be up to 7m beyond the extent of the stands, or greater depending on the species identified;
- Entry and exit points to the exclusion zones should be clearly identifiable, and all site personnel should be notified as to where these points are located;

- Exclusion zones must also be set up in order to keep machinery and personnel away from any stored contaminated clay or plant material;
- Only vehicles required for essential works will be allowed within an exclusion zone, and the number of visits minimised as much as practicable;
- Any personnel or machinery accessing a designated exclusion zone must be subject to strict biosecurity protocols, as outlined within the ISMP;
- Exclusion zones should remain fenced off and implemented for the entire duration of the project, until the IAS's have been effectively treated or removed;
- Site hygiene signage, specific to the management of the invasive species identified within the site, will be erected and made clear to all site personnel; and
- All site personnel should be appropriately trained as per the ISMP.

3.2.2 Use of Herbicides or Chemical Treatment Products

- If herbicide is to be applied as a treatment option, it is likely that application of the herbicide may be required for more than one year, and up to five years depending on the species being applied to, in order to ensure that plant control measures have been effective. The length of treatment may also vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within one to two years, whereas non-persistent herbicides (such as glyphosate) may take over a period of at least three years to ensure the successful eradication of the plants;
- A range of herbicides are available for the chemical control of IAS's, and includes herbicides such as Glyphosate, 2,4-D Amine. Glyphosate is non-persistent and can be used near water but it is not selective (i.e. it is a broad spectrum chemical and will impact all plant species), whereas 2,4-D Amine can be persistent for up to one month, and can also be used near water but is more selective on certain plants;
- The selection of chemicals by the contractor and supervising ecologist will depend on seasonal factors, site conditions, proximity to water, surrounding habitats etc;
- In order to ensure that the use of herbicides does not contravene legislation, the contractor must comply with Circular Letter NPWS 2/08 Use of Herbicide Spray on Vegetated Road Verges from the National Parks and Wildlife Service dealing with the application on to non-target areas. In addition, a qualified and experienced contractor will be employed to carry out all treatment works;
- If chemical or herbicide treatment is to be carried out, then it is recommended that the appointed contractor prepares a site-specific treatment plan in accordance with the relevant guidelines before commencing works;
- Should treatment be carried out within close proximity to water, or where there is a risk of contaminating watercourses, then the choice of herbicide should be limited to formulations of Glyphosate and 2,4-D amine that are approved for use near water, or similar approved herbicides. It is recommended that chemical control via the application of herbicides is not carried out within 5m of any existing surface water feature, including local drainage infrastructures. If herbicide application is necessary within this area, then only herbicides which are approved for use near water should be used;
- Herbicides should be applied during peak growing periods (typically from May – September), however local climate conditions such as temperature and rainfall can determine the effectiveness of treatment applications. Treatment outside the peak growing season is often ineffective, as plants are dormant during winter periods and do not take in the herbicide treatment;
- In the case of Knotweed, depending on weather and temperatures in the days following the initial treatment, and to ensure optimal uptake of herbicide into the rhizome system, a second similar treatment may be required (usually within ten days), before the internal vascular system is no longer capable of translocating the herbicide to the root system;

- A systemic herbicide (e.g. Picloram) and/or a bioactive formulation such as glyphosate based Round-Up Proactive may be sprayed on foliage during dry weather or injected directly into the stems of IAS's. Strong systemic herbicides are most effective at targeting the persistent roots, however it should be noted that they may also persist in the soil and/or kill surrounding vegetation;
- Foliar treatment (spraying) is usually applied with a sprayer such as a knapsack sprayer or a larger spray system. It is important to use a treatment dye to identify clearly all areas treated. Foliar treatment is an efficient way to treat large areas of invasive plants, or to spot-treat individual plants that are difficult to remove mechanically (such as Japanese Knotweed). While the upper surface of the leaves will be easier to treat, it is also important to treat the leaf under surface as Knotweed possesses many stomata openings on the leaf under surface;
- Injecting herbicides directly into the stem of the plant is a common method for controlling and eradicating IAS's, however this method is more suitable for smaller stands given that it is labour intensive. This form of treatment typically requires a higher concentration of the active ingredient than is used in foliar applications, and involves the use of a specialist herbicide injection tool whereby the injection tool injects the herbicide directly into the plant;
- Following application of herbicide treatment during the first season, annual spot-checks should be conducted during the early growing season in order to identify any re-growth of the plant;
- Regrowth may occur in subsequent years, and if this is the case then further herbicide treatments should be undertaken each year until no regrowth occurs;
- Manufacturers guidance and current regulations on the use of chemical or herbicide treatment should be strictly adhered to at all times.

Once a contractor has been appointed for works, the ISMP should be updated to contain their contact details, schedule of works, methodologies to be used throughout all phases of the development, and the management techniques chosen with regards to IAS's found within the development area. The ISMP should be updated to include a more detailed management strategy for IAS's, and an ECoW's should be appointed to oversee the pre-construction enabling and demolition works, and also for the construction phase of the project.

Given the potential for IAS's to regrow or re-establish themselves on the site, it is recommended to carry out a post-construction Invasive Species Survey within one year of completion, and to update the ISMP accordingly. Records for any treatment should be maintained for the duration of the project, and follow up treatment should be carried out, where applicable, until no further regrowth of the IAS has occurred.

3.3 Waste management

- A Construction and Demolition Waste Management Plan (CDWMP) should be prepared by the Appointed Project Contractor for the construction phase, and should form part of the detailed CEMP;
- The CDWMP should be developed using the EPA, "*Best Practices Guidelines for the preparation of resource & waste management plans for construction & demolition projects*" (2021), Environment Protection Agency, TII (2017) *Guidelines for the Management of Waste from National Road Construction Projects*, GEENV-01101, Transport Infrastructure Ireland, December 2017, and "*A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020 – 2025*";
- Contractors working on site during the works will be responsible for the collection, control and disposal of all waste generated by the works. Construction phase waste may consist of hardcore, stone, concrete, steel reinforcement, ducting, shuttering timber, food waste from the canteen and unused oil, diesel and building materials. This waste will be collected

at the end of the construction phase and taken off site to be reused, recycled and disposed of in accordance with best practice procedures at an approved facility;

- Domestic wastewater from the on-site holding tank will be collected on a regular basis by approved contractors and disposed of in an authorised facility in accordance with best practice, or disposed of within the mains or foul sewerage system as permitted;
- Plastic waste will be taken for recycling by an approved contractor(s) and disposed or recycled at an approved facility. All waste generated during construction, including surplus excavation material to be taken off-site, shall be only recovered, or disposed of at an authorised site which has a current Waste Licence or Waste Permit in accordance with the Waste Management Acts, 1996 to 2011;
- This shall not apply to the reuse of excavated material within the applicant's site boundary;
- Specific waste management of contaminated soils, handling and disposal of soil which may have been affected by IAS's, or handling of hazardous materials is considered under the relevant specific control measures;
- A Waste Manager will be nominated who will have overall responsibility for the implementation of all waste processes. In conjunction with this, a clear responsibility structure will be introduced for the construction staff/contractor to ensure issues encountered are raised at an appropriate level and acted upon. This is essential in ensuring that all waste is properly dealt with;
- Source Segregation: The contractor will be obliged to implement source separating wastes into dry mixed recyclables, biodegradable, and residual wastes. Clear labelling of waste bins, containers, skip containers and storage areas, including waste stream colour coding and photographs as appropriate;
- Waste Auditing: The contractor will be obliged to implement good record keeping, including quantities (tonnes) and type of waste and materials leaving the site. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material, which is recovered, and which is disposed;
- Appropriate Storage: Waste fuels/oils will be generated from equipment used on-site during construction and will be classified as hazardous waste. Paints, sealants, and hazardous chemicals etc. will be stored in secure, bunded locations. All hazardous waste will be separately stored and labelled, in appropriate lockable containers, prior to removal from site by an appropriately permitted waste collection service provider;
- Efficient Removal: Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility;
- Any waste which cannot be reused onsite and arising from the demolition or construction phase of the proposed development will be transferred to an appropriate facility in accordance with the current national waste policy. This is necessary so that all waste is disposed of to the best possible facility type to adhere to the circular economy and resource opportunity strategies;
- If unforeseen waste or hazardous material is encountered during the proposed development, then the appropriate authorities will be notified and the material will be transferred at an appropriate waste facility;
- There is a possibility that unforeseen or hazardous material is encountered during excavation works, therefore staff will be trained in how to identify contamination and how to manage it if encountered. Identification will include visual checks for unusual discolouration, oil sheens, anthropogenic materials, and checks for olfactory clues such as hydrocarbon or other odours. Suspect contaminated material will be sampled and appropriately analysed at a laboratory;
- Records will be kept on the quantity nature/type and quality of all waste leaving the site;
- By-product notifications (under Article 27 of the EC Waste Directive Regulations 2011) provide an opportunity for reuse of surplus clean soil and stone material arising from construction activity. At the time of construction, options for Article 27 by-product status

or similar will be reviewed by Monaghan County Council and the appointed contractor, subject to waste management and planning requirements being fully met. Such opportunities offer potential to further reduce indirect effects of waste management resulting from the transport of materials from site, notably traffic, noise, and air emissions from transport-related haulage;

- Exported materials, particularly soils, will be carefully managed to restrict the spread of invasive alien plant species (IAP's), as outlined in the ISMP.

3.4 Drainage & Surface Water Management

The purpose of this plan is to describe measures for the management of excavations, the management of all surface water and run-off on the site, and in particular, sediment and erosion control. As a minimum, the following should be implemented in order to effectively management surface water runoff and drainage from the site, and to prevent excessive erosion and sedimentation :

- Monitoring of the weather forecast prior to planning excavation works;
- Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction;
- Stripped pavement/soil material will be temporarily stockpiled more than 10m away from any drain or watercourse or taken off-site;
- Stockpiles will be in a dry zone that is not subject to ponding;
- Providing bunds or other diversions to keep run off from entering the stockpile area where required.
- Providing impermeable mats (plastic sheeting) as covers to mounded excavated material and open excavations during periods of heavy rainfall;
- Earth movement activities will be suspended during periods of prolonged rainfall events;
- The earthworks material will be placed and compacted in layers to prevent water ingress and degradation of the material;
- Drainage and associated pollution control measures will be implemented on site before the main body of construction activity commences;
- Runoff of surface water from construction areas will be controlled;
- Silt-laden runoff should be expected from any areas of recently exposed soil or rock. There is also potential for pollution to occur from machinery used in the construction;
- Any introduced or artificial materials required (e.g. silt fencing, straw bales, sand bags, etc.) that might need to be deployed onsite, will be removed on completion of the works;
- Discharge from the silt control measures will be discharged into the existing drainage network within the proposed development site, or stored and contained until it is removed offsite for further treatment;
- Additional drainage measures will be implemented to help attenuate the increase in surface water flows, if surface water is observed discharging from the construction compound;
- Surface water management and sedimentation control measures shall routinely be monitored for effectiveness, and repairs or improvements shall be carried out promptly as required;
- In order to achieve the restricted 'Greenfield' run-off rate: permeable pavements, rain gardens, attenuation tanks and discharge flow controls limiting the storm water discharge from the development are included within the drainage design. The attenuation tanks are situated at each car park with flow controls and a final flow control immediately prior to the discharge location at the Dublin Street roundabout, and should be constructed in accordance with the drainage plan;
- In order to cater for the future foul flow generated by the Development Plots, a foul drainage sewer has been provided along Russell Row, with spur connections to the Development Plots, and should be constructed in accordance with the drainage plan.

3.5 Sediment Control

Runoff from the development area is anticipated to have high silt loading due to mobilised soils from excavated surfaces, fines from track aggregate and sludge due to traffic movements through the site. As such, the following control measures should be implemented in order to minimise excessive sedimentation, particularly as silt laden runoff from the site:

- Prior to works commencing, sedimentation control measures shall be put in place, to include the installation of silt fencing along the eastern and southern peripheral edge of the site. In addition, sediment control measures should be put in place along the bridge section prior to works commencing within Old Cross Square. Sedimentation control measures and silt fencing locations should be clearly shown within the CEMP and accompanying drawings;
- The silt fencing will consist of a geotextile filter fabric supported by vertical posts and anchored in the soil by establishing a shallow trench at the base of the fencing. The base of the geotextile fabric will line the shallow trench, i.e. turned upwards, and the excavated loose soil backfilled on the geotextile fabric;
- Materials and machinery will not be stored immediately adjacent to the silt fencing, which may cause the silt fencing not to function effectively. The silt fencing layout must allow for the movement of machinery within the site and ease of maintenance;
- Silt fencing will be monitored throughout the day in order to ensure that they are performing as required, and have not become clogged with sediment. The silt fence integrity will be inspected daily to ensure it intercepts surface water runoff within the site, captures sediment contained in surface water runoff and reduces velocity runoff. If defects in the fencing are observed, these will be repaired and/ or rectified immediately;
- Excavated materials should be removed off-site as soon as practicable, in order to prevent excessive suspended solids loading during rainfall periods and surface water runoff. In the event that stockpiled or excavated soil materials are to be kept overnight, then the materials should be covered by a tarpaulin (or equivalent covering) and surrounded by silt fencing, which should be installed according to manufacturers guidelines;
- Whenever practically possible, site clearance or ground works should not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours;
- Gullies should be covered over where siltation or sedimentation is likely to occur, in order to prevent blockages or impediment of the existing drainage network;
- All sediment and surface water runoff should be managed in accordance with a surface water management plan, and detailed within the CEMP;
- All surface water runoff should be treated for suspended solids, oils and grease, prior to being discharged into the local drainage network. This can be in the form of swales, gullies and sediment traps;
- No surface water runoff within the site should be discharged directly into any watercourse at any time;
- As soon as practically possible, any damaged or cut ground should be reinstated to reduce suspended solids loading during rainfall runoff;
- Repeated handling of soil will be avoided and ideally all soil stockpiles will remain undisturbed until otherwise required;
- All excavation and earthworks will be carried out in accordance with BS6031:2009 Code of Practice for Earthworks. Soil handling, extraction and management will be undertaken with regard to best practice guidelines;
- If any contaminated earth is uncovered, this will be stored separately and disposed of accordingly once the contaminant has been identified;
- Efforts will be made to ensure that water does not accumulate in excavated areas;

- Surface water management and sedimentation control measures shall routinely be monitored for effectiveness, and repairs or improvements shall be carried out promptly as required.

3.6 Fuel Management

Hydrocarbon use during the demolition and construction phases may lead to potential pollution of waterways. Examples of potential threats include spillages during re-fuelling operations, leaks in poorly maintained plant and machinery and the use of oil on shuttering boards. In order to reduce or mitigated against accidental spillage of hydrocarbons or contamination, the following should be adhered to:

- Fuelling of machines will be carried out away from all watercourses, with all machines provided with spill kits. Vehicles being used to deliver fuels should be certified in accordance with relevant regulations and double bunded;
- Wherever possible, no fuels should to be stored on site;
- In the event that fuels are necessary to be stored on site, these shall be located within the allocated storage containers. All fuels, lubricants and hydraulic fluids should be kept in secure bunded areas as far away from all watercourses as practically possible. The bunded area will accommodate 110% of the total capacity of the containers within it;
- All fuel or oil storage containers will be properly secured to prevent unauthorised access and misuse;
- Fuel fill pipes will not extend beyond the bund wall and will have a lockable cap secured with a chain;
- Where it is necessary for fuel to be brought to site, for deliveries and dispensing activities, it will be ensured that site specific procedures are in place for bulk deliveries, and that delivery points and vehicle routes are clearly marked. Emergency procedures should be displayed and a suitably sized spill kit made available at all delivery points;
- An effective spillage procedure should be put in place. Site operatives should be provided emergency spill kits which should be stored on-site during the construction period at all times. Such kits should contain absorbent materials (such as absorbent granules, booms or mats). Operatives responsible for handling chemicals, fuels or oils, or for plant refuelling, should be trained in the use of this kit;
- Any waste oils or hydraulic fluids should be collected, stored in appropriate containers and disposed of off-site in an appropriate manner.
- Where appropriate, drip-trays should be used, and should conform to Best Practice Guidance such BPGCS005 Oil Storage Guidelines (Enterprise Ireland);
- Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (i.e. consaws and jerry cans). Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled, and containers and equipment will be stored in a firm level surface;
- Vehicles should never be left unattended during re-fuelling;
- All vehicles should be regularly maintained and checked to prevent hydrocarbon leaks. An up-to-date service record will be required from the main contractor;
- Where open gullies or channels are present on site, then gully covers will be used in order to prevent surface water runoff;
- All stationary machinery such as generators should be placed on drip trays in order to collect and contain any hydrocarbon spillages. These trays should be checked regularly, and rainwater removed to maintain their effectiveness;
- Wherever possible, hydraulically operated machinery should utilize synthetic biodegradable hydraulic oil;
- Only qualified persons shall operate plant machinery;

- Plant/equipment shall be checked on a regular basis to ensure they are working properly (no oil/fuel leaks etc.);
- Control measures for preventing hydrocarbon release shall routinely be monitored for effectiveness, and repairs or improvements shall be carried out promptly as required.

3.7 Management of Concrete and Bituminous Material

Concrete and bituminous material has the potential to impact upon surface water quality if not properly managed. Therefore, the following outlines appropriate management of concrete and bituminous products during the construction stage of the development:

3.7.1 Concrete Materials Handling & Pouring

- To reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Environmental Manager or Clerk of Works;
- Ensure that the area of the pour is completely drained of water before a pour commences.
- Prior to concrete pours of kerbing etc., the pour area will be inspected to ensure that the pour site is completely sealed (shuttering etc.);
- Pours should 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;
- 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 washed down on site;
- The concrete trucks shall wash down their chutes at a designated chute wash down area within the temporary Construction Compound (away from the works area);
- The wash down area shall consist of a polythene lined bunded area of about 10m³ capacity. The collected washdown water will be disposed of using a registered contractor;
- No disposal of concrete remnants will be permitted on site;
- The use of wet concrete and cement in or close to any water body will be carefully controlled so as to minimise the risk of any material entering the water;
- Where possible, a specific fast-setting mix (by having either a higher-than-normal fines content, a higher cement content or the use of ecologically-appropriate chemical admixtures, will be used to minimize risk of ecological impacts.
- Concrete will not be allowed to enter watercourses under any circumstances, and drainage from excavations in which concrete is being poured will not be discharged directly into existing watercourses;
- Delivery trucks, tools and equipment will be cleaned at the wheel wash facility located at the temporary site compound.

3.7.2 Paving/Bituminous Materials

- Stockpiles of paving or bituminous material, tar and related products (if required) will be kept to a minimum size, covered and located away from any watercourse;
- In order to prevent contaminated or silt-laden runoff from entering drains or watercourses, a range of temporary measures will be implemented (as required), including silt fences, cut-off ditches, silt traps, straw bales, entrapment matting & drainage to vegetated areas;
- Construction works will be avoided during prolonged periods of very heavy rainfall;

- Any spillage or excess material will be cleaned and disposed off site to an appropriate licensed waste facility, and using licensed waste disposal contractors.

3.8 Noise & Vibration Control Measures

The following should be adhered to in order to negate or minimise the effects of noise and vibration impact that the construction activities may have on sensitive receptors:

3.8.1 Noise Control

- The Principal Contractor will be required to liaise with the local Environmental Health department of Monaghan County Council in order to ensure that noise during the construction phases is effectively managed. All Contractors will be required to employ best practicable means to minimise noise during each phase of the development.
- The Principal Contractor will be required to manage noise and vibration in accordance with BS 5228-1:2009;
- The contractor / developer will establish and maintain good community relations and will engage local residents / commercial operators prior to commencement of operations and site works. This may include informing local residents/neighbouring properties on progress of the site by way of a leaflet drops for example and ensuring measures are put in place to minimise noise impacts. A telephone “hot line” and agreed procedure for the contractor to investigate and report on complaints will be set up for particularly noisy phases of works (such as rock hammering etc);
- All onsite operatives shall be trained to employ appropriate techniques to keep site noise to a minimum, and shall be effectively supervised in order to ensure that best working practice in respect of noise reduction is followed;
- The schedule of works and site working hours will be carried out on the basis of the noise threshold limits outlined in this report, and taking into account the principles outlined in BS5228:2009+A1:2014;
- Any static plant will be positioned as far as possible from residential properties, and utilising available screening by temporary structures, acoustic screens etc;
- For any particular job, the quietest available plant and/or machinery will be used. Where appropriate, it must be constructed to meet the requirements of EC Directives;
- Site operators will avoid unnecessary revving of engines, and all plant equipment will be maintained in good mechanical order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- All plant and vehicles used in the works shall have exhaust silencers in good working order and diesel plant shall be fitted with effective air intake silencers. All ancillary pneumatic percussive tools shall be fitted with mufflers or silencers as recommended by the manufacturer, and where necessary acoustic barriers can be used to shield them;
- Any machinery which is in intermittent use should be shut down in intervening periods of non-use or where this is impracticable, it should be throttled back to a minimum;
- Every effort will be adopted in order to minimise drop height of materials, ideally lowering materials wherever practicable;
- Plant should be started up sequentially, rather than simultaneously;
- All site staff will be informed about the need to minimise noise and will be supervised to ensure compliance with the noise control measures adopted;
- The use of concrete saws will be used briefly and intermittently throughout the day, rather than in a prolonged concentrated block at end of day;
- The Contractor will seek to minimise the total level (ambient plus construction) noise and strive not to exceed the limiting criteria outlined within this CNMP. However, where this is not possible then practicable mitigation measures should be developed and implemented

in order to minimise the overall noise impact on sensitive receptors, and through consultation with Environmental Health;

3.8.2 Vibration Control

- All appointed contractors will adhere to the vibration guidelines as outlined in BS5228-2:2009+A1:2014. Vibration limits will be included within tender documents for potential contractors to take into consideration when committing to a schedule of works;
- The contractor shall employ the “best practicable means” in order to minimise noise and vibration resulting from operations and shall have regard to British Standard BS 5228 Code of Practice for Noise Control on Construction and Open Sites Parts 1 and 2;
- The construction contractor will provide evidence of having liaised with all relevant receptors (residential and commercial) prior to commencement of each phase of works. This will include notification of intended noise & vibration sources and a brief schedule of works; and
- A copy of the neighbour liaison evidence should be made available to Environmental Health upon request;
- Any noise or vibration related complaints should be managed by means of the site complaints procedure, and in conjunction with the local environmental health department;

3.8.3 Noise & Vibration: Monitoring Requirements

In the event that noise related complaints are received, or that the recommended noise limits are exceeded (or likely to be exceeded) at relevant residential receptors, then noise monitoring will be carried using the following principles:

- The Contractor shall designate an Environmental Manager/Responsible Person who, amongst a range of other responsibilities, will liaise with environmental advisors, statutory bodies and the local community as required with respect to noise and vibration impacts during the demolition and construction phases;
- All monitoring will be carried out using the principles outlined in BS4142:2014 and BS5228-1:2009+A1:2014. Noise levels will be recorded using an approved Class 1 1:3 octave noise analyser, and the monitoring period agreed in advance with the Environmental Health department. The data should include 1:3 octave frequencies to determine tonality, and should present data for the following parameters: $L_{Aeq,T}$; L_{A90} ; L_{A10} ; L_{AFmax} ;
- A suitable number of noise monitoring locations shall be established around the site boundary or at the relevant residential receptor locations, as required. The microphone shall be situated in a free-field location, approximately 1.2 to 1.5 metres above local site level. Measurements shall be made in accordance with good acoustical practice, and care should be taken in order to avoid the effects of local acoustic screening and acoustic reflections;
- In the event that noise complaints are received, then monitoring shall be carried out at the complainants property, with their permission. Should permission not be granted, then a suitable alternative monitoring position should be agreed with the Environmental Health department. Monitoring should be carried out for a sufficient period that will allow a robust assessment of the effects of the construction noise sources on the receptor positions. Upon analysis of the results, and in the event of exceedances of noise limiting criteria, then suitable mitigation measures should be developed and agreed with the Council thereafter;
- All operators of noise monitoring equipment shall be trained and competent to undertake the measurements;
- In the event that complaints have been received and that noise monitoring is required, then real time measurements should be made available during the monitoring period

(typically telemetry based), as these can highlight specific sources of noise, or issues that can enable immediate remedial actions to be taken. A precise daily log of each construction activity undertaken will be kept on site and made available for inspection when requested. If a $L_{Aeq,T}$ value exceeds the noise threshold level, or should a complaint be received, then the log can be examined and the site activities which created the contravening noise will be established. The Contractor can then take further mitigation steps relating to the activity to prevent recurrence;

- The duration and location of noise monitoring will be agreed with Environmental Health, and the analyser data will be provided in text and digital (.csv) format for review; and
- Copies of all noise measurements shall be made available to Environmental Health upon request;
- In the event that complaints are received in relation to vibration, it is therefore recommended that continuous vibration monitoring of PPV and VDV should be undertaken, for x,y,z axis;
- The location of vibration monitoring should be chosen based on the closest affected receptor position to the vibration source. In most cases the receptor position is likely to represent the external façade position of a building structure, therefore permission should be sought to deploy vibration monitoring equipment within the receptor property. Should permission not be granted, then it may be necessary to choose an alternative location, either at a receptor with similar setback distances, or if this is not possible, then monitoring should be carried out at a representative boundary position within the confines of the development area;
- Vibration monitoring data should be made available in real-time (typically obtained using a telemetry system) in order to assess the ongoing effects of vibration on the receptor position. Real-time monitoring data also enables immediate action to be undertaken in the event that vibration threshold limits are exceeded;
- It is recommended that set alert thresholds for PPV at 1mm/s, 2.5mm/s and 10mm/s, which should preferably be delivered real-time via text messaging alerts or by email alerts;
- Vibration monitoring should record the PPV and VDV parameters continuously through the monitoring period, and the results should be reviewed each day for exceedances. A copy of the results should be made available to Environmental Health for review on a weekly basis by means of a collated report. In the event that vibration threshold levels have been exceeded, then the Council should be informed and appropriate mitigation measures developed before further works can be undertaken;

3.9 Dust & Air Quality Control Measures

The following control measures should be adhered to, in order to negate or minimise the effects of dust generation and air quality impacts on local sensitive receptors:

- Prior to demolition and construction phases, a site plan should be developed to ensure that machinery causing dust generating activities are located away from receptors as practically possible, or within the confines of the site centre in order to minimise off-site dust migration;
- Wherever practically possible, the contractor should erect solid screens or barriers around dust generating activities or along the site boundary to the height of any stockpiles onsite;
- The site or specific operations should be fully enclosed (where practically possible) where there is a high potential for dust generation and where site activities are likely to occur for extensive periods of time, such as rock hammering or concrete cutting;
- The site ground surfaces should be regularly cleaned and kept free of mud and debris, and site runoff should be treated accordingly in order to minimise dust generation;
- Site fencing, barriers and scaffolding should be cleaned using wet methods, in order to minimise dust migration; and

- All demolition materials should be removed off-site as soon as possible, and all temporary stock or construction materials should be covered in order to minimise dust generation as a result of wind whipping.

3.9.1 Dust Management: Vehicle & Machine Operation

- All vehicles should be switched off when not in use, i.e. no idling vehicles. This reduces the potential to impact upon local air quality in terms of NO₂ and particulate emissions;
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment wherever practicable;
- Ensure that vehicles entering the site does so at less than 10mph;
- All vehicles should be maintained and operated in accordance with the manufacturer's recommendations;
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. plant equipped extraction;
- Ensure an adequate on-site water supply for effective dust/particulate matter suppression/mitigation, and using non-potable water wherever possible;
- Workers should minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate, and chutes or conveyors should be enclosed. All skips and waste material storage areas should be covered;
- The contractor should ensure that equipment is readily available on-site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods; and
- The contractor should ensure that no burning of waste materials will take place on-site.

3.9.2 Dust Management: Additional Demolition Measures

- The contractor should carry out the demolition phase in accordance with prepared schedule of works;
- Soft strip should be undertaken within the building structures prior to demolition (retaining walls and windows in the rest of the building where possible, to provide a screen for dust);
- The contractor should ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- Only manual or mechanical means of demolition should be used, i.e. no explosives or blasting should take place;
- Any biological or asbestos materials should be dampened and bagged prior to removal from site, and prior to any major demolition phases taking place;
- All demolition materials should be removed from site as soon as possible, and should be covered when on-site for temporary storage;
- Wet dust suppression should be used throughout phases of superstructure demolition, in order to minimise dust generation and migration from site;
- Any significant dust generating phases (i.e. superstructure demolition etc) should be scheduled in advance, and Environmental Health and local receptors notified as necessary.

3.9.3 Dust Management: Additional Construction Measures

- The contractor should carry out the construction phase in accordance with prepared schedule of works, as available;
- The contractor should ensure that sand and other aggregate materials are stored either in bunded areas and are not allowed to dry out, unless this is required for a particular process, or under cover in order to minimise wind generated dust;
- All bulk cement and other fine powder materials should be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery. For smaller fine powder materials, the contractor should ensure that bags are sealed after use and stored appropriately to prevent dust generation;
- All waste materials produced during the construction phase should either be stored temporarily under cover, or should be removed off-site as soon as possible to an appropriate waste management facility; and
- During prolonged dry weather periods, the contractor should dampen the ground conditions, particularly along access routes etc, in order to prevent excess dust being generated by traffic.

3.9.4 Dust Management: Trackout Measures

The contractor should use water-assisted dust sweeper(s) on access and local roads to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;

- The contractor should ensure that all HGV or material haulage vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- All haulage routes and local road access should be regularly inspected for damage, and repairs to the road surface should be carried out as soon as reasonably practicable. A record of road inspection should be maintained and a log book kept; and
- Any internal routes or traffic areas (i.e. hardstanding) should be dampened with mobile sprayers, and where necessary a wheel wash system should be installed, if practical.

3.9.5 DUST MANAGEMENT: MONITORING

- The contractor should carry out daily on-site and off-site inspections for dust deposition, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to local authorities upon request. This should include regular dust soiling checks of surfaces such as street furniture, cars and windows within 100m of site boundary, with cleaning to be provided if necessary;
- The contractor should carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked;
- During periods where activities with a high potential to produce dust are being carried out, or during prolonged dry or windy conditions, the inspection frequency should be increased in order to determine if additional mitigation measures are required;
- In the event that dust complaints are received, the contractor should develop a suitable dust monitoring program in consultation with Environmental Health, and should be developed in harmony with the principles laid out in the latest version of IAQM "*Guidance on the assessment of dust from demolition and construction*";
- Dust monitoring positions and methodology should be agreed in consultation with Environmental Health, the results should be made available thereafter. Upon review of the results it may be necessary to develop additional mitigation measures which will minimise future impact potential from nuisance dust.

3.9.6 Dust Management: Site Management

- A record should be maintained for all dust and air quality complaints made in relation to site activities and should be reported to Environmental Health for review. Appropriate mitigation or remedial measures should be agreed with Environmental and implemented as soon as possible following consultation, and the DMP updated accordingly;
- A complaints log should be maintained for off-site complaints and onsite issues relating to staff complaints. The complaints log should be made available to Environmental Health upon request;
- A record of exceptional incidents or potentially significant dust generating activities should be maintained, along with the appropriate measures taken to ensure dust impact is minimised or negated. A review of the effectiveness of mitigation measures should also be carried out and logs maintained; and
- A review should be carried out periodically in order to identify other potential dust generating sources in close proximity to the site, such as other off-site construction activities etc. Should any significant sources be identified then attempts should be made to co-ordinate activities in order to minimise the cumulative effects of dust impacts on local receptors.

3.10 Lighting

In order to minimise or negate the effects of artificial lighting on bat populations, specifically along the proposed public footpath area within the Old Infirmary Hill community garden area, it is recommended that luminaires should achieve the recommended criteria set out in the LLP & BCT Guidance Note GN08/23 document. The document outlines a series of rationale for designing lighting schemes aimed at reducing lux levels and effects on bat activity, and should include, wherever practically possible, the following:

- Prior to the design and installation of lighting, a lighting contour plan should be developed by a competent lighting professional, using an appropriate software package to model 'Day 1', extent of light spill from the proposed, retained and any existing luminaires. In some circumstances, a vertical illuminance contour plot may be necessary to demonstrate the light insensitive areas, such as entrances to roosts or the Key Habitat associated with it, should these be identified during pre-construction or pre-demolition surveys;
- The contours (and/or coloured numbers) for 0.2, 0.5, 1, 5, and 10 lux must be clearly shown, as well as appropriate contours for values above these. Each illuminance/lux contour plan should be accompanied by a table showing their minimum and maximum illuminance/lux values;
- The calculated lux levels and lighting contour maps should be reviewed by an ecologist in order to ensure the lighting scheme will be in compliance with ecological legislation, particularly with reference to bats;
- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used;
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component;
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill;
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges ;

- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards;
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered ;
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt;
- Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate;
- Use of a Central Management System (CMS) with additional web-enabled devices to light on demand;
- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS;
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues;
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely;
- The lighting scheme should take into consideration all the relevant guidance within the GN08/23 document and should submit the final lighting scheme and supporting rationale to the council for review.

3.11 Cultural Heritage Specific Mitigation

The Proposed Development has been informed by Cultural Heritage desktop studies, site investigations (testing), fieldwork and statutory consultation (National Built Heritage Service – NBHS) undertaken during the design and assessment phases to avoid, reduce and/or offset predicted receptor impacts. Based on the findings of the Cultural Heritage Impact Assessment Chapter, the following specific mitigation measures have been recommended for the construction phase of the development:

- There is potential that sub-surface archaeological finds and/or features associated with the historic medieval/post medieval town of Monaghan, (including the medieval town defences and the area of Old Cross Square formerly ‘The Shambles’ exist within the Red Line Boundary. Ground works during the construction phase will be subject to archaeological monitoring by a licence-eligible archaeologist under licence by the National Monuments Service;
- In the event that any sub-surface archaeological features are identified during archaeological monitoring they will be securely cordoned off, cleaned and recorded in situ. The National Monuments Service will then be notified and consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation);
- The Market Cross in Old Cross Square requires re-siting as part of a re-imagined public space that provides connectivity and linkage to the new proposed Russell Row and other planned development (Monaghan County Council Civic Offices) to the north of the Proposed Development. The Market Cross is in the guardianship of Monaghan County Council. In advance of construction stage (pre-works) the monument (with prior

consultation and Section 14 Ministerial Consent and agreement by statutory bodies) will be subject to a detailed written and photographic survey log, to be augmented as part of an updated condition report. This will be carried out together with a detailed methodological specification for dismantling, safe and appropriate storage provisions, conservation works (off-site) where required, and reinstatement at the new location in as 'as built' manner at the end of construction stage. A conservation architect will oversee and supervise the works, together with an attending on-site licence-eligible archaeologist, where required as part of any ground reduction or landscaping provisions at construction stage;

- In advance of construction stage (pre-works), the upstanding remains of the Old Infirmary (FO1-FO5) will be cleared (by hand) of all dense vegetation, with a built heritage written, drawn and photographic survey undertaken together with a conservation management plan to consolidate, re-point and make-safe any walling/features, and to install suitable surface treatment (such as fine gravel) as required. The latter will enable effective management of future vegetation growth and to provide visitor accessibility that can tangibly interact with the ruins. On-site bespoke and high-quality interpretative signage will be provided that documents the local history of the 'Old 12' site within the new town amenity area;
- There may be associated sub-surface built heritage remains of the Old Infirmary located within the proposed Community Park area. Any landscaping works (ground reduction measures, drainage, lighting etc) that are required in and around the Old Infirmary footprint area, and within the park generally, will be monitored by an attending licence-eligible archaeologist at construction stage. This will facilitate the evaluation of any identified features and provide for an agreed strategy with National Monuments Service for the best course of action (preservation in situ or preservation by record).

3.12 Architectural Heritage Specific Mitigation

- Prior to any demolition, it is recommended that structures identified within the Architectural Heritage Chapter of the EIAr have a Level 3 Analytical Survey carried out by the Project Conservation Architect in order to capture a permanent record of the structure which will be offered to the Irish Architectural Archive.
- The re-use of material from demolished structures will be incorporated into the proposed design where appropriate.
- A detailed survey, competent contractor & appropriate method statements will be necessary for alteration of heritage structures.
- The following mitigation methods are proposed and will be applied on a structure-by-structure basis as per Table 13.15 of the EIAr to the affected architectural heritage:
 - Record survey.
 - Protection in-situ during construction.
 - Protection off site and relocation to a new position.

3.13 Townscape & Visual Impact Specific Mitigation

The townscape and visual effects associated with the demolition and construction activities of a large development, such as the proposed, are generally difficult to mitigate.

However, a number of measures, which typically form part of good construction 'design', have been recommended and will ensure that these effects are kept as low as possible. They include

- well planned/phased construction works;
- a well organised/tidy construction site;
- a construction period, which is kept as short as is safely possible; and
- construction fencing, which will screen much of the works (although the fencing itself will cause some visual effects).

3.14 Traffic & Transport Specific Mitigation

Mitigation specific to transport and traffic will include the development of a Traffic Management Plan for the construction and demolition phases, and for all phasing of works and in particular how the scheme will be constructed i.e. keeping the traffic connection between The Diamond and Dublin Street Roundabout live during the works.

4.0 ENVIRONMENTAL PERFORMANCE INDICATORS

The Contractor will outline the key performance indicators (KPIs) for the Site in gauging successful site management in the prevention of pollution and the protection of the environment. Environmental performance indicators, which should include:

- Number of environmental accidents/incidents logged;
- Breach of procedure and corrective actions;
- Number of environmental complaints received;
- Results of monthly water quality monitoring if required;
- Results of noise and vibration monitoring, and
- The results of site audits and KPI's will be communicated to all relevant personnel and sub-contractors. The review periods for analysing site performance indicators must also be specified.

5.0 RECORD KEEPING

- The Construction Manager will ensure that fully detailed records are maintained of any 'incident /event' likely to cause non-compliance and / or harm to the environment;
- Environmental Incidents/Near Miss Reports are reported and recorded.
- Complaints and Follow up Actions on the construction site will be managed by the CMT and contractors will ensure that all complaints are recorded according to CMT requirements.
- Each contractor will be responsible for ensuring that a full record and copy of all Safety Data Sheets (SDS) pertaining to their works is kept on file and up to date in their site offices/other.
- Contractors will also retain a duplicate copy of all SDSs held by the contractors.
- The Project Manager will be responsible for monitoring the movement and treatment of all waste during the construction phase of the project.
- Records will be kept for each waste material which leaves the site, whether for reuse on another site, recovery, recycling or disposal, and will include the following:
 - Volume and type of waste exported offsite for reuse
 - Volume and type of waste exported offsite for recovery
 - Volume and type of waste exported offsite for recycling
 - Volume and type of waste exported offsite for disposal
 - All excavation and disposal locations
- A signed waste collection docket will be retained by the Waste Manager from the licensed waste contractor for waste taken off-site;
- Each material type will be examined in order to see where the largest percentage waste generation is occurring;
- The waste management methods for each material type will be reviewed in order to highlight how waste can be minimised, and a waste audit should be carried out by the Waste Manager at the site during the construction and demolition phases of the proposed development;

- Upon completion of the construction and demolition phases, a report will be prepared summarising the volumes and types of waste streams exported from site, and a summary review completed for the waste management processes which were adopted during the process;
- The audit should provide the total volumes of recycling / reuse / recovery figures for the proposed development.

6.0 RESPONSE PROCEDURE / CORRECTIVE ACTION

In the event of an environmental incident, or breach of procedure, or where a complaint is received, or in the event of encountering buried waste or contaminated soils/groundwater, the contributing factors are to be investigated, and remedial action taken as necessary. The Contractor will ensure that the following response actions will take place:

- The Project Manager must be informed of any incident, breach of procedure and/or complaint received and details must be recorded in the incident/complaint register;
- The Project Manager is to conduct/co-ordinate an investigation to determine the potential influence that could have led to the non-compliance;
- The Project Manager is to notify and liaise with the appropriate site personnel where required, e.g. Site Environmental Manager;
- The Project Manager shall notify the Client of any complaints or environmental incidents within 24 hours of occurrence. Where significant incidents occur requiring the involvement of statutory authorities or emergency services or where any pollution events occur, the Client shall be notified within 1 hour;
- If necessary, the Project Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident;
- The details of the incident will be recorded on an Incident / Complaints Form which is to record information such as the cause, extent, actions and remedial measures used following the incident/complaint. The form will also include any recommendations made to avoid reoccurrence of the incident;
- The Project Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Designer and Client as appropriate;
- The Project Manager is to ensure that the relevant environmental management plans/procedures are revised and updated as necessary.

6.1 Corrective & Preventative Action

Corrective Action Requests will be issued to ensure that prompt action is agreed and committed to, with a view to the effective resolution of any deviations from the CEMP requirements or any environmental issues.

7.0 TRAINING

Contractors should conduct safety meetings / toolbox talks on relevant EHS topics for all employees in their care on a regular basis. All construction personnel will be required to complete contractor induction and be certified with FÁS Safe-Pass or equivalent. The Contractor's Method Statement will detail the environmental awareness training and induction which is required to be undertaken by all staff, including sub-contractors. This will ensure that they are acutely aware of their responsibilities detailed within the CEMP and the associated sub-plans, as well as the Environmental Control Measures in place to ensure that the commitments/ requirements are met throughout construction. Training of all site staff and personnel will include as a minimum:

- Induction training including environmental requirements of all operatives and subcontractors;
- More detailed training for staff or sub-contractors with specific environmental responsibilities;
- Tool box talks will reflect the type of works being undertaken and the environmental impacts that may result from these activities e.g. training on water pollution prevention before works near watercourses. Training to be given will include the contents of this CEMP incorporating the following as appropriate:
 - Protected species/habitats
 - Invasive species
 - Environmental incidents
 - Water pollution prevention
 - Spill control and spill kits
 - Dust and air quality
 - Noise
 - Erosion and sediment control
 - Storage and use of petrol, diesel, and oils
- Any contract specific information will be briefed to all staff and displayed on notice boards. Training records regarding any environmental training will be provided on site by the Contractor;
- Any works which require a site-specific method statement will require a toolbox talk to be provided to all personnel involved. This is to ensure that the Environmental Control Measures in place are understood and practiced.

8.0 CEMP

This document provides an outline Construction Environmental Management Plan (oCEMP), and omits specific details which are not yet available, given that the project is still within the planning stage. Once specific details become available, a detailed CEMP should be developed, and will thus supersede this oCEMP document.