Proposed Civic Office Development at Roosky Lands

Construction and Environmental Management Plan

220084-RY-00-Z00-XXX-RP-DBFL-CE-0002

INFRASTRUCTURE

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DBFL CONSULTING ENGINEERS

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1 Introduction

This document is an initial Preliminary Construction & Environmental Management Plan (PCEMP) for the proposed works. It includes an outline description of the proposed works and how these works will be managed for their duration.

The project is currently at planning stage and as such input from the contractor has not been incorporated into the plan. On appointment of a contactor this preliminary document will be issued to them to be further developed into their final Construction & Environmental Management Plan (CEMP) for the project. The final CEMP would be submitted by the contractor to be agreed with the planning authority prior to commencement of development.

The outline plan seeks to demonstrate how works can be delivered in a logical sensible and safe sequence with the incorporation of specific measures to mitigate the potential impact on people and the surrounding environment. The aim of this preliminary plan is to provide a framework for the development of the full Construction and Environmental Management Plan (CEMP).

Nothing stated in this document shall supersede or be taken to replace the terms of the Contract or the detailed design description issued with the Contract tender or the conditions of planning. Similarly, the issues covered within this document may be amended or added to by the Main contractors or in accordance with their specific works proposals, sequencing and procedures.

When read by the contractor, this document should be read carefully in conjunction with all drawings, specifications and survey information provided.

The contractor shall also incorporate all mitigation measures outlined in supporting planning documents.

Any consequences that result through failure to implement measures in this construction plan, or inadequate development of this plan by the contractor are the responsibility of the contractor and not DBFL.

2 Background & Existing Conditions

This PCEMP has been prepared by DBFL Consulting Engineers in support of the planning application for the Proposed Civic Office development at Roosky Lands. The proposed Scheme is within the administrative area of Monaghan County Council (MCC).

All works must be carried out in accordance with the mitigation measures outlined in this document and with the construction mitigation measures from the Resource & Waste Management Plan, EcIAR, Arborist Report, Noise Report and Archaeology and Built Heritage reports submitted with this application.

2.1 Site Location

The subject site is 3.9Ha and is located in Roosky Lands, north of the existing Ulster Canal Greenway route, refer to Figure 2-1. This area is surrounded by the following:

- A portion of the site is located south of the Shambles River and is bounded to the South by residential apartments, industrial buildings and the Monaghan wastewater treatment plant.
- Most of the subject site is bounded to the South by the Shambles River, to the east by Monaghan Harps GAA.
- To the west, the site is bounded by vacant lands designated for future development.
- To the north the site is bounded by Glaslough street and the St. Davnets Hospital.
- Existing boundaries comprise predominantly trees, fencing, hedgerows, boundary/Retaining wall adjacent to the Diamond Apartments.

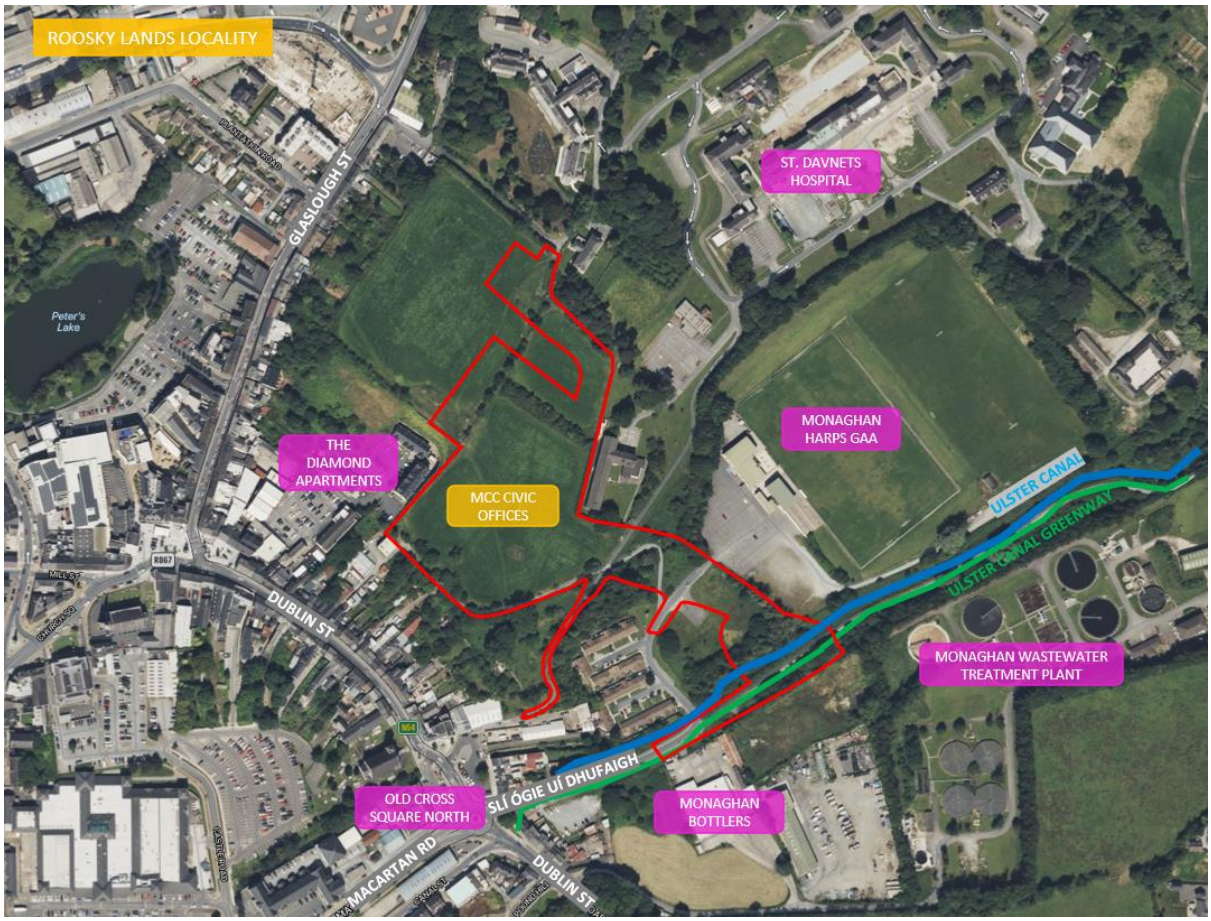

Figure 2-1: Site location (indicative red line) [Source Bing maps]

2.2 Existing Environmental Conditions

2.2.1 Water Environment

- Watercourses present in the proposed development lands consist of the River Shambles
- The proposed development crosses the river Shambles and is considered sensitive to potential hydrological impacts on water quality/quantity from the scheme. Therefore, the scheme will need to ensure impacts on surface water quality/quantity are avoided
- The Bedrock Aquifer is a Regionally Important fissured bedrock.
- The proposed development site is located within a Drinking Water Protection Area.

2.2.2 Land & Soil

GSI Quaternary sediment mapping indicates most of the scheme to be underlain by till derived from limestones.

Refer to Site Investigation Reports submitted with the application for full details. Summary provided below,

- The sequence of strata varies across the site and generally comprises of;
    - Topsoil/surfacing from approximately 0 - 0.25m
    - MADE GROUND from approximately 0.25m- 0.5m depth (comprised of brown/grey sandy gravelly clay, angular stones, red brick pieces, roots)
    - MADE GROUND from approximately 0.25-0.85m depth (comprised of soft grey/dark brown/brown sandy gravelly clay/silt, angular cobbles and boulders, organic matter)
    - Cohesive Deposits, Soft to firm from approximately 2.0- to end depth (comprised of , grey, slightly sandy gravelly silty CLAY with medium cobbles and organic matter content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are subangular to subrounded) .
- Classification tests on cohesive soil samples from borehole and trial pit locations revealed variations in soil composition, with SILT matrix till occurring at shallow depth below the topsoil and CLAY dominant till at greater depth, representing glacial till or boulder clay deposition. The gravelly CLAY plots indicate low plasticity soil with Natural Moisture Content ranging from 12 to 26%. Wet sieve and hydrometer analysis showed a straight line

grading from fine clay to coarse gravel fraction, typical of glacial till or boulder clay deposition.

- Organic content test on soil samples from the site showed low to negligible organic content, with values ranging from 1.0 and 2.5% , and Samples generally taken from shallow depths below the topsoil.
- Chemical test on soil samples from the site showed Sulphate concentrations (SO4 2:1 extract) levels ranging from 0.010 to 0.24 g/l where established with pH values ranging from 7.8 to 8.6 and Chloride concentration of 0.010 to 0.024 g/l, these values are deemed low and do not require any special precautions to protect below ground foundation concrete.
- Waste Characterisation Assessments conducted on soil samples from the site showed that the site does not contain any hazardous materials. Materials can be retained and repurposed at the office building site. Most of the material along the Active Travel Links route may be repurposed, with the exception of material located near the attenuation pond. This material consists of made ground and does not meet soil recovery requirements. Despite this, they are deemed acceptable for disposal in a landfill.

No evidence of contaminated ground, mines, quarries, or waste facilities have been identified on both geological mapping and site investigation within the proposed development.

2.2.3 Arborist Survey

Refer to Arborist Report submitted with the application for full details. Summary provided below,

- **Location & visual impact** of the trees. The lands comprise open fields and small plantations near the centre of Monaghan Town. Most of these lands were formally associated with adjoining Hospitals or with the Ulster Canal. Some of the conifer plantations were planted to provide shelter and screening to the Hospital buildings, or to screen adjoining developments from the Hospital lands and some of these groups should be considered important in the local landscape.
- **Historical development of the site**. The oldest trees reported are mature ash and beech that are growing on lands formally associated with an old Infirmary that once occupied part of this site. These trees are probably over one hundred and fifty years old. Most of the mature conifer trees are probably about seventy years old and most seem to have

been planted at the same time. There are also areas of much younger saplings that have grown from naturally dispersed seeds within the last twenty or thirty years.

- **Tree condition & recommendations.** Many of the ash trees growing on this site are suffering from ash dieback (Hymenoscyphus fraxineus). Some of these trees have been marked for felling. It is likely that most of the remaining ash trees will succumb to this disease over the next ten years or so. The Sitka spruce plantation growing along the old Ulster Canal are also showing excessive death. The dead trees should be removed, and the remaining specimens should be considered to have a limited life expectancy.

2.2.4 Archaeology & Built Environment

Refer to Archaeology Report submitted with the application for full details. Summary provided below,

An archaeological assessment of Roosky Lands, Monaghan was conducted by Franc Myles of Archaeology & Built Heritage during the month of September 2022. This assessment involved a desktop study involving cartographic, topographic, or historical records and a visual assessment of the land within the proposed site. The results suggested the presence of a possible enclosure within the site and a disused Ulster Canal along the existing Greenway.

Archaeological test trenches were conducted on-site on 30/01/2023 in response to the preliminary assessment. The results show that there are no archaeological features (enclosures) were present at the location. However, remnants of the buried historical Ulster Canal walls were found to be located along route of Ulster Canal Greenway. The presence and its location imply that the former canal route and structure survives in situ beneath the route of the Ulster Canal Greenway, running parallel and to the south of the Shambles River. The proposed new access route to the Roosky lands will be constructed on part of the line of the greenway/canal in this area

2.2.5 Biodiversity

Refer to Ecological Impact Assessment Report submitted with the application for full details. Summary provided below.

- The proposed works are not proximate to either Slieve Beagh SPA or Kilrooskey Lough Cluster SAC which are Natura 2000 sites of international importance. There is no connectivity between the proposed works and the designated sites. There is also significant distance between the proposed site of works and the designated sites.

- A hydrological connection exists between the works and a designated site in Northern Ireland. The River Shambles connects downstream to the River Blackwater which discharges to Lough Neagh. This is part of the Lough Neagh and Lough Beg SPA. The significant remove of this designated site would preclude any likely impacts from the present works.
- No proposed Natural Heritage Areas (NHA) and or NHA will be impacted from the proposed development.
- Three wetland habitats were identified as having the possibility to be affected by the development as they are located downstream along the River Blackwater. These are Knockaconny -Ulster Canal, River Blackwater at Corvally and West of New Mills Bridge. However, impacts are unlikely and can be readily mitigated during construction.
- Otters may travel along minor or culverted watercourses and use features set back from the river such as banks and thickets as resting places or to create breeding holts. The previous recorded occurrences of Otters in the local watercourses and suitability of habitats within the study area give rise to an important constraint.
- Potential habitats suitable for bats within the study area were identified, these were two areas with particularly mature Beech and Scot's Pine trees, the hedgerows within the study area were species poor- and low-quality regarding suitability for bats.
- Five Annex I wintering species of Birds may potentially occur within the study area. The riparian corridor and vegetated fringe of the study area contain a watercourse providing suitable habitat for nesting birds. The Kingfisher expands its winter wetland habitats area over breeding habitats and may be found in the area. The impact is considered of minor significance.

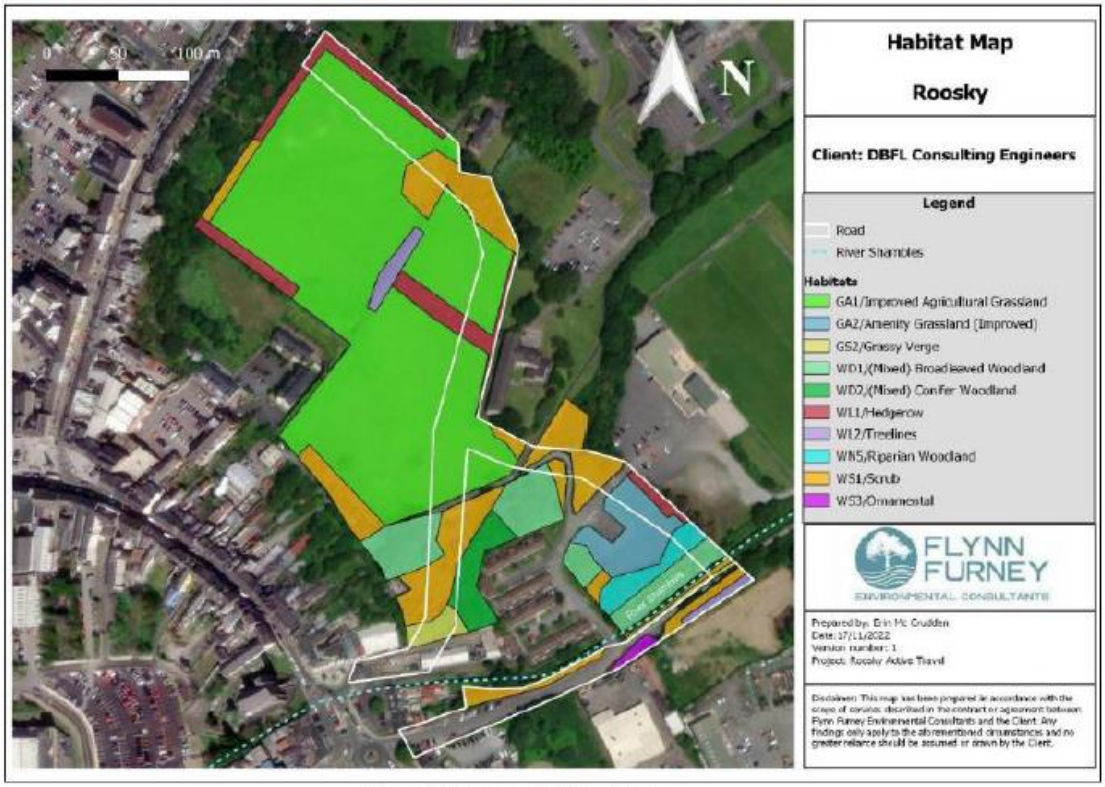

Figure 1.2: Rooskey Habitat Map

Figure 2-2: Roosky Lands Habitat Map

Further information on the Ecology of the subject site is included in EcIA Report submitted with this application.

3 Proposed Scheme

3.1 Description of Development

The proposed development will consist of the construction of new civic offices, together with associated infrastructural works.

It shall include the following:

i. Construction of a new civic office building consisting of:

   a) office accommodation with a cumulative gross floor area (GFA) of 5,601 sq.m distributed over 3 floors incorporating entrance foyer, office spaces, meeting rooms, staff canteen, Council chamber, public counter and reception desk, welfare facilities, internal landscaped courtyards and supporting spaces;

   b) external plant enclosure (104.42 sq.m) and waste store room (49.58 sq.m GFA) at ground level; and

   c) covered services enclosure of 169.93 sq.m GFA at ground level containing plant, water tank, switch room, ESB substation, power distribution and supply rooms, and fire escape.

ii. 112 No. Surface car parking spaces and drop-off area.

iii. 80 No. Bicycle parking spaces.

iv. Improvement works to existing road infrastructure and the provision of pedestrian, cycle and vehicular links comprising:

   a) extension (approx. 120m in length) to existing vehicular route on Slí Ógie Uí Dhufaigh along the route of the existing Ulster Canal Greenway.

   b) realignment of portion of the existing Greenway.

   c) construction of a priority junction on existing roadway serving Roosky Vale at the interface with the extended Slí Ogie Uí Dhufaigh;

   d) provision of a new 13m clear span bridge over the River Shambles.

   e) provision of new combined vehicular/pedestrian link, 'Quarry Walk' (approx. 460m in length) comprising a 5.5m vehicular carriageway, two-way cycle track, footpaths, and roadside SuDs swale;

f) provision of a replacement vehicular access to Monaghan Harps GAA club and associated pedestrian links;

g) upgrade of existing pedestrian route (Davnet's Row) to Diamond Centre; and

h) upgrades to the existing Infirmary Hill Path to improve link to Old Cross Square.

i) Works to facilitate potential future pedestrian and cyclist connections to the adjoining Diamond Centre and the existing public right of way known locally as 'Pump Entry'.

v. Signage is to be erected consisting of:

a) Wayfinding signage at 4 locations; to the south-west at Davnet's Row Plaza, to the south along Davnet's Row, to the east at the junction between Infirmary Road and Davnet's Row and at the proposed entrance on Infirmary Road.

b) Building identity signage comprising 2.1m x 2.1m backlit logo panels on the north-east and south-west facades at building entry points and will include 300mm high text to read Monaghan County Council.

vi. Provision of surface water attenuation, diversion of existing watermain infrastructure and provision of new surface water, foul and watermain infrastructure.

vii. Associated earthworks, utilities, landscaping, boundary treatments, lighting, roof-mounted solar PV on the civic office building and all ancillary site development worksCivic Office

4 Programme

4.1 Duration

The project i.e. the civic office and access/Active Travel Infrastructure will be procured and constructed in a single contract.

A construction period of approximately 24 months is expected for the overall development. When a contractor is appointed post planning permission, they will produce a Programme for construction which will be submitted to the Local Authority for approval before any works commence.

4.2 Working Hours

For the duration of the proposed infrastructure works the maximum working hours shall be 08:00 to 19:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays, subject to the restrictions imposed by the local authority. No working will be allowed on Sundays and Public Holidays. Subject to the agreement of the local authority, out of hours working may be required for utility connections, roadworks on existing roads, resurfacing works etc.

4.3 Programme Constraints

Any in stream works will be constructed during the instream open season (between June – September only). Weather conditions will be monitored throughout the construction period by the contractor and works will not be carried out during extreme rainfall or high flow events and shall take notice of other statutory and best practice working period restrictions imposed.

Tree and shrub removal will be ideally carried out between September and February (inclusive). If this is not possible, an ecologist will survey relevant vegetation in advance in order to determine whether any protected fauna is present. If any are encountered, the vegetation clearance will be delayed until the protected fauna has moved away from the area, a derogation licence will be sought only where no alternatives exist.

Where the works include elements which will affect access or operations within residential and commercial properties, the contractor shall liaise with all property owners to ensure the works schedule is co-ordinated with landowner requirements to minimise disturbance and provide temporary access measures as appropriate. Affected accesses are outlined in Section 6

5 COMPOUND FACILITIES / PARKING

The primary construction compound for the works is anticipated to be located as per Figure 5-1 below. The compound may be relocated as the project progresses. The compound shall be constructed using a clean permeable stone finish and will be enclosed with security fencing. Site accommodation to be provided will include suitable washing / dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc. Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure.

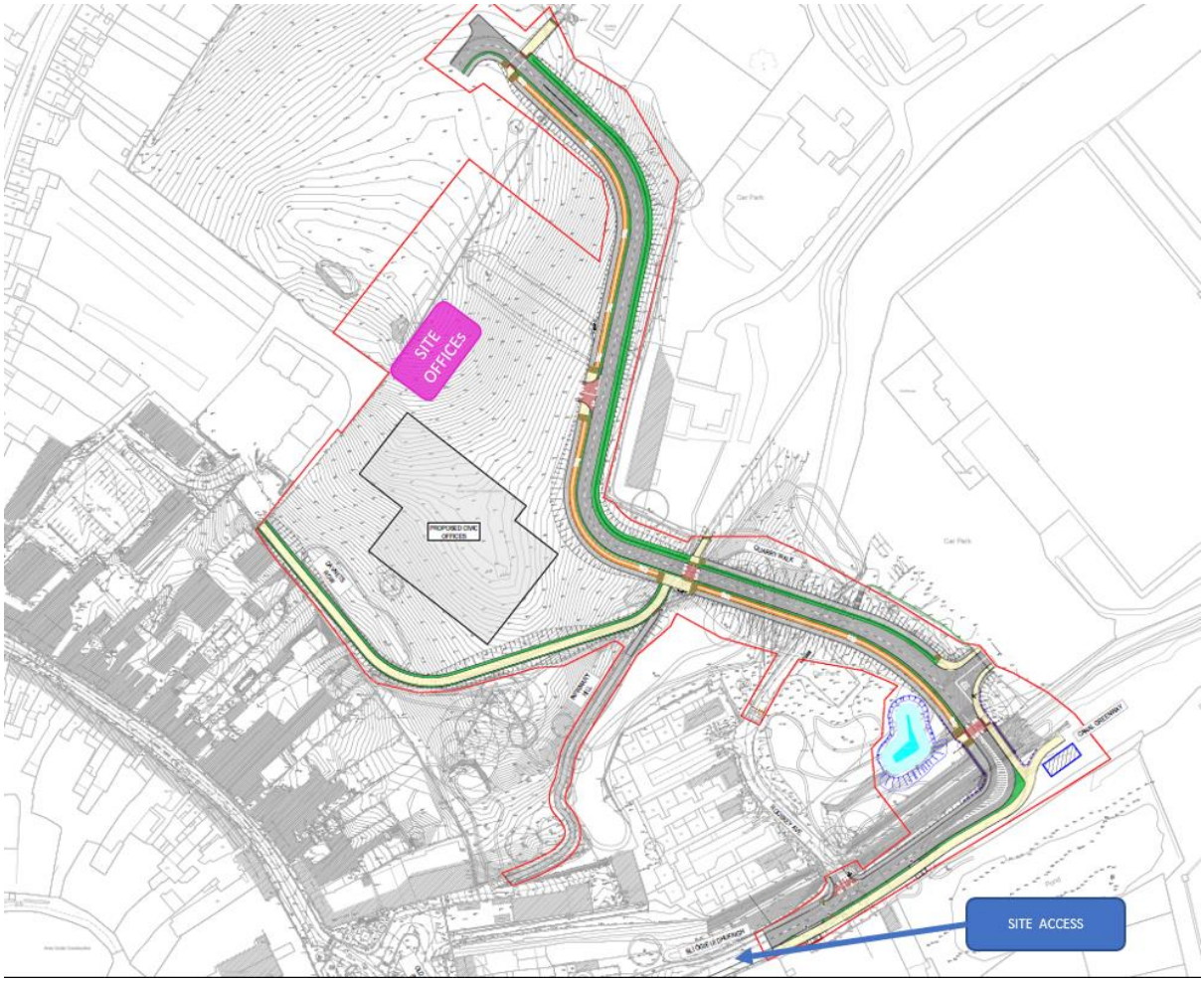

Figure 5-1: Indicative Site compound layout

A permeable hardstand area will be provided for staff parking and these areas will be separate from designated machinery / plant parking.

The contractor will strive to maintain a tidy site and to operate a "just in time" policy for the delivery and the supply of materials for the works, particularly the final phase of the works when on site storage will be at a minimum.

A material storage zone will also be provided in the compound area. This storage zone will include material recycling areas and facilities.

A series of 'way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas.

On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and the site compound area shall be fully reinstated.

A teleporter will be used for general unloading during the structural and envelope works. Unloading over the public roadway and path will be avoided.

6 SEQUENCING

An indicative works sequencing plan is set out below which will be subject to further development and amendment for the construction stage CEMP / Construction Stage Management Plan

6.1 Phase 1

Phase 1 will include construction of the extension of Sli Ogie Ui Dhufaigh street, the proposed realigned Ulster Canal Greenway, new access to Monaghan Harps and the proposed bridge as seen in Figure 6-1. These works can be constructed off the existing road network and will not affect access to Roosky Vale or Monaghan Harps.

The works will affect the existing Ulster Canal Greenway – The Greenway Route shall be maintained open through the works site as much as possible during this phase and the opening of the permanent realigned route shall be prioritized. Given the constrained nature of the section it is however anticipated that some short-term diversions of the Greenway will be required to ensure safe separation between greenway users and construction works refer to Figure 6-2. The existing Black Lane is currently used as part of the Greenway route and can be used to divert users around the works area via Armagh Road/ Dublin Road.

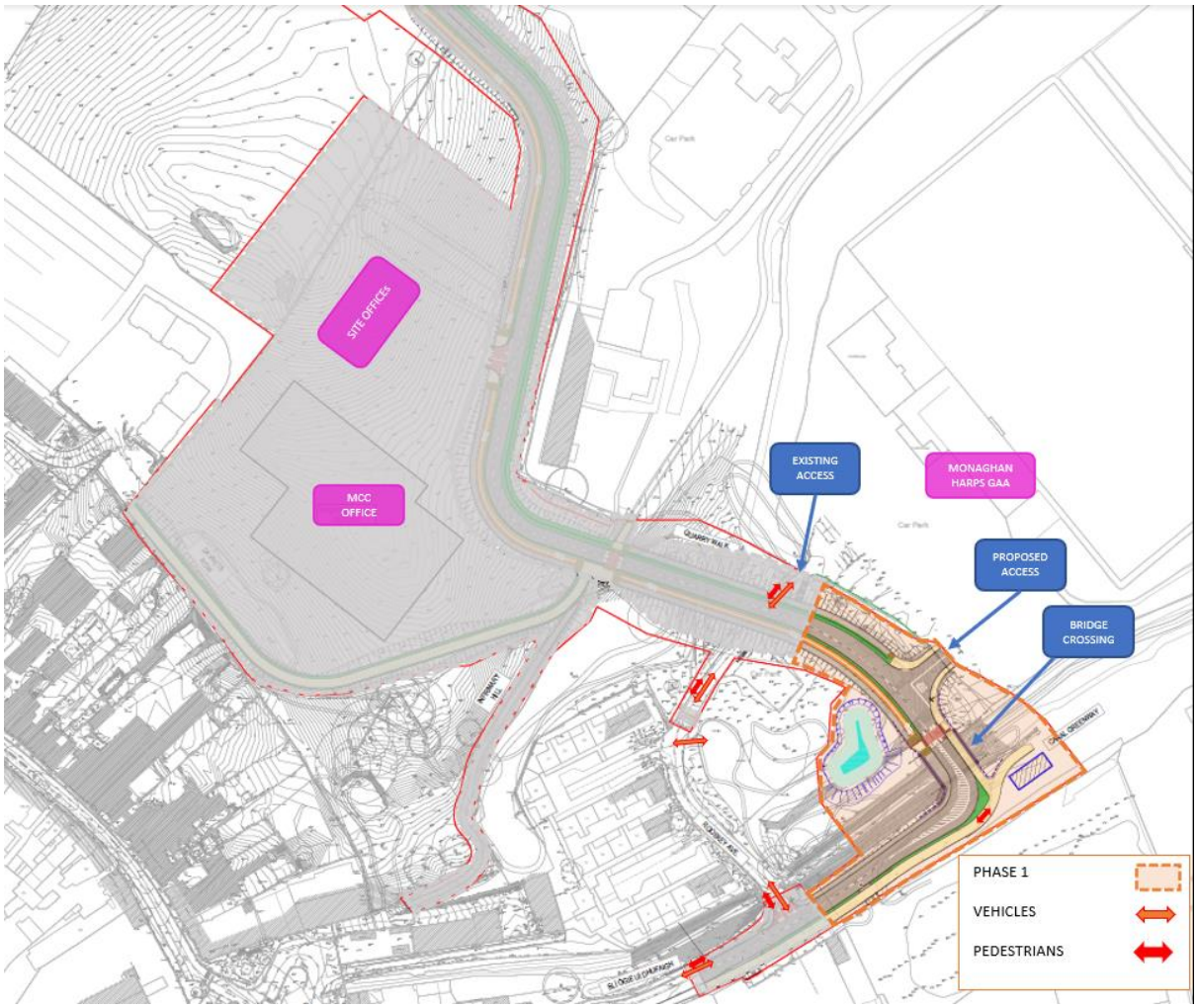

Figure 6-1: Indicative Phasing Plan – Phase 1

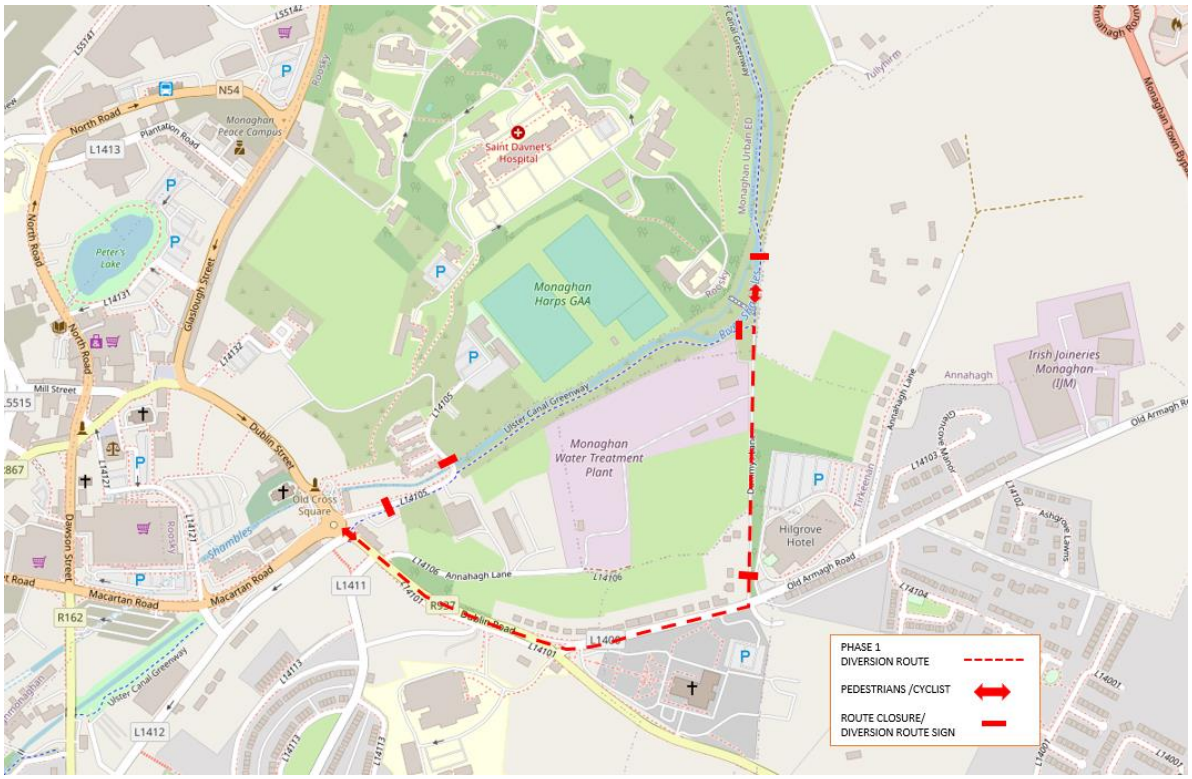

Figure 6-2: Indicative Greenway Temporary Diversion

6.2 Phase 2

Phase 2 will include the tying in of the extended Slí Ógie Uí Dhufaigh to the existing road network which allows for the establishment of the revised permanent access to Rooskey Vale and Monaghan Harps, the opening of the realigned greenway and closure of the existing Monaghan Harps Access to facilitate new road construction. Some periods of one-way alternating traffic on the existing Slí Ógie Uí Dhufaigh will likely be required to facilitate tie in works, see Figure 6-3.

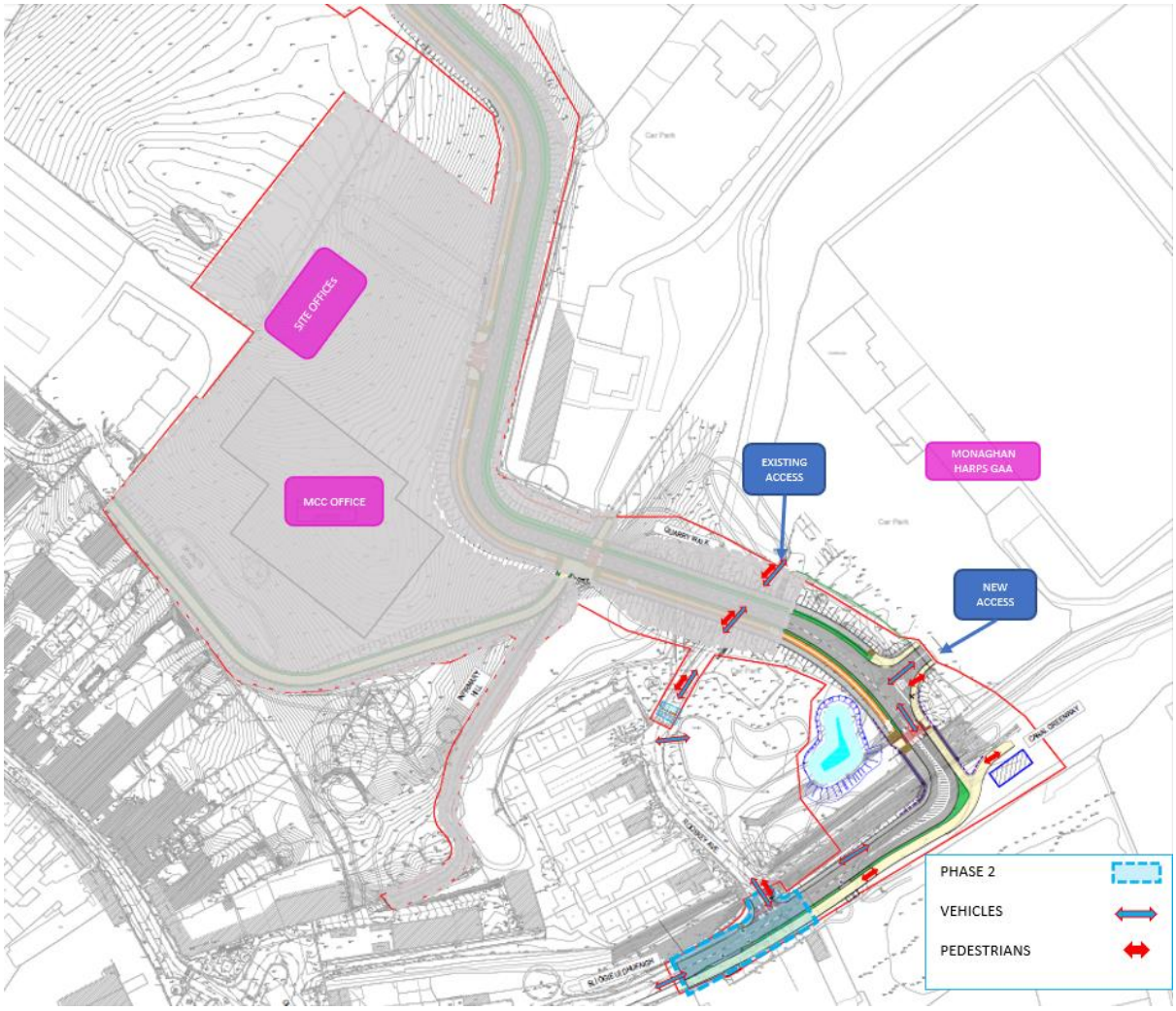

Figure 6-3: Indicative Phasing Plan – Phase 2

6.3 Phase 3

Phase 3 will involve the completion of the remainder of Quarry Walk. During this Phase Monaghan Harps and Rooskey Vale can be accessed as per the proposed permanent access measures along the roadways constructed/amended as part of Phase 1 and 2. The greenway can also be opened in its permanent arrangement. Construction Traffic accessing the ongoing works beyond can also utilise the constructed works, see Figure 6-4.

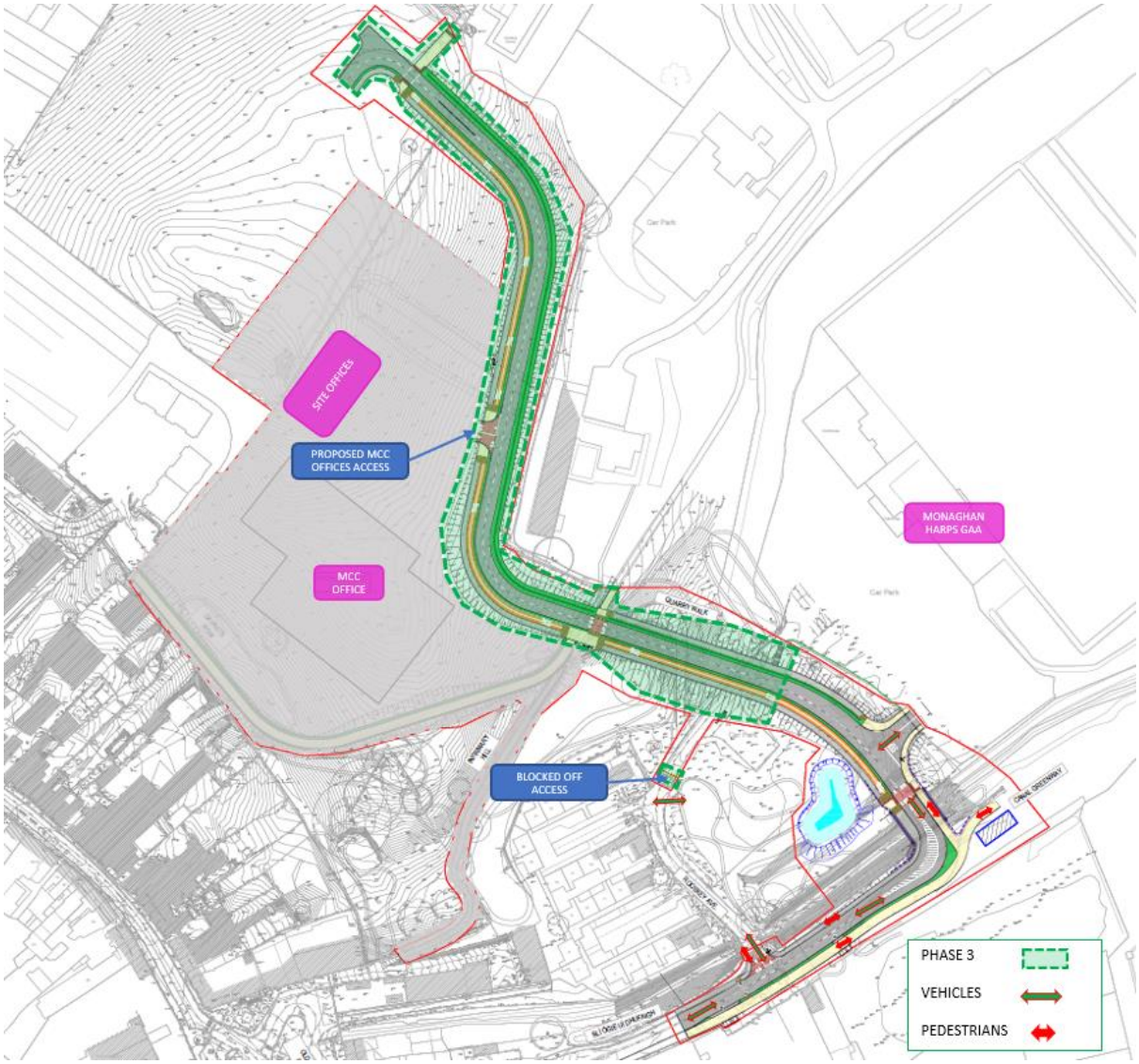

Figure 6-4: Indicative Phasing Plan – Phase 3

6.4 Phase 4

Phase 4 works will include construction of the MCC office, Davnets Row Shared Link and the improvement works along Infirmary Hill Path. Access To MHG Club, Rooskey avenue residents and Site Office will be maintained as phase 3 traffic arrangements. Construction traffic access and egress to the MCC office will be facilitated by the newly completed Quarry walk. Access to Ulster Canal Greenway will be maintained along the newly realigned Greenway, see Figure 6-5.

The Contractor shall use the roadways constructed in the previous phases and Davnets Row in this phase for access to construct the building structure. The Contractors site offices/storage locations will be decommissioned and the proposed car park will constructed in its place.

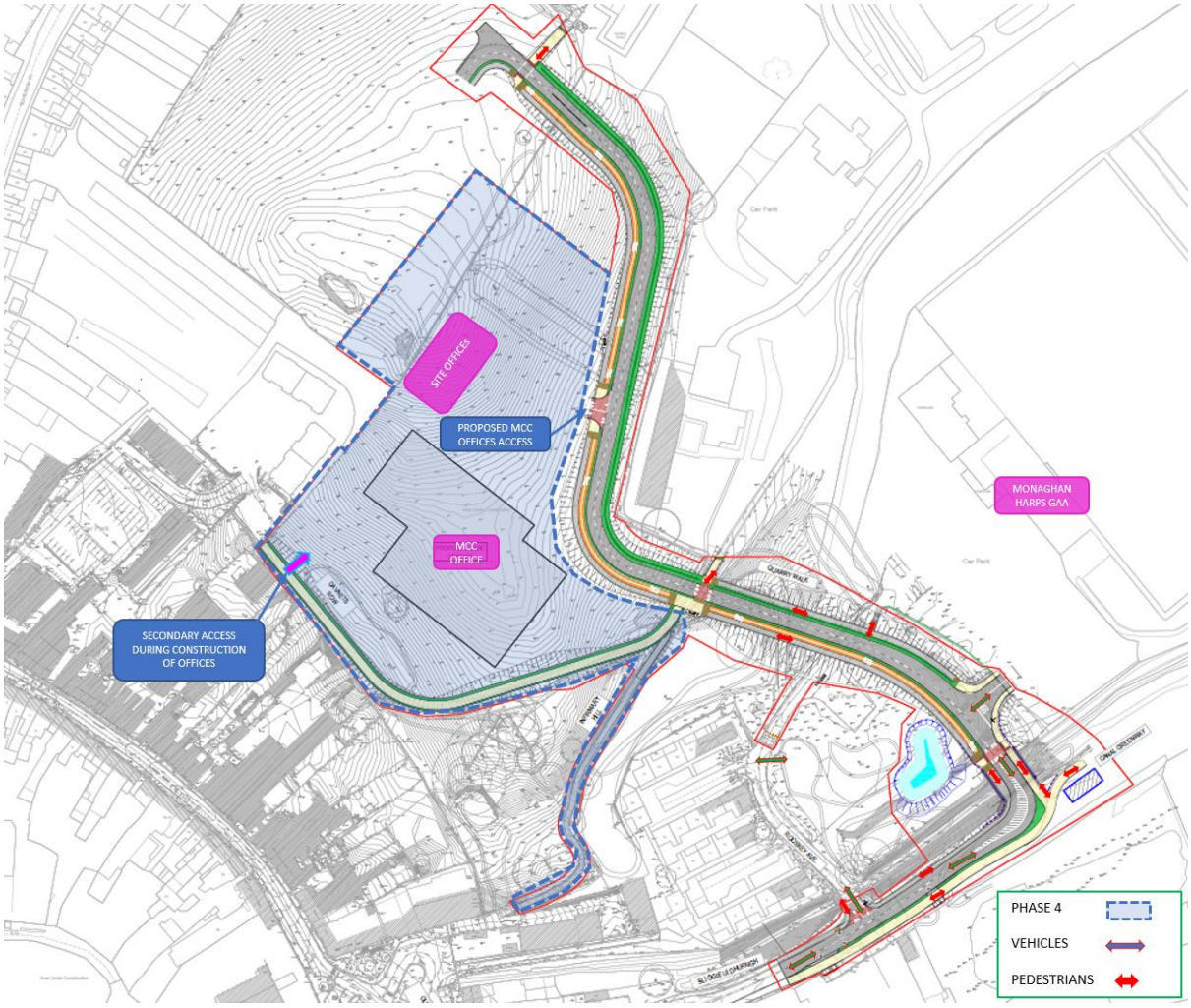

Figure 6-5: Indicative Phasing Plan – Phase 4

7 TRAFFIC AND TRANSPORTATION

On appointment of a main contractor, a Construction Stage Traffic Management Plan (CTMP) will be prepared, the details of which will be agreed in full with Monaghan County Council prior to the commencement of construction activities on site. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders thereby ensuring that both the public's and construction workers safety is maintained at all time, disruptions minimised and undertaken within a controlled hazard free / minimised environment

The CTMP shall be prepared in accordance with the principles outlined within this report and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual (2019) – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

In general, the impact of the construction period will be temporary in (HGV vehicle movements not expected to exceed 50 vehicles per day during the busiest period of construction works).

On-site employees will generally arrive before 08:00, thus avoiding morning peak hour traffic. These employees will generally depart after 18:00.

All construction traffic will enter the site from the south from Old Cross Square roundabout via Slí Ógie Uí Dhufaigh road which crosses the Shambles River into Rooskey Vale Avenue. Security facilities will be provided at the entry point with adequate off-road queuing facilities to avoid construction traffic queuing onto the existing road network.

Construction traffic will generally consist of the following categories:

- Private vehicles owned and driven by site staff and management.
- Construction vehicles e.g. excavation plant, dump trucks and material delivery vehicles, involved in road and infrastructure construction.

Where practicable Contractor's staff will commute by shared vehicle, public transport or other modes. The Contractor may provide off-site parking at a suitable location where travelling by public transport is not practicable for workers. Construction vehicles will not be permitted to park on the public roads unless designated or permitted to do so.

Traffic control personnel will be stationed on public roads during peak hours where required to manage traffic flow efficiently.

Evening/Weekend hours will not require on site management considering minimal to no construction-related traffic. Weekday traffic will be managed through well-coordinated traffic control measures to minimize congestion and delays. The strategy will be adaptable to changes in traffic patterns and construction progress.

The scheme shall be constructed in a manner to minimise disruption to road users, local residents and businesses. All construction works to be undertaken in a clearly delineated site area which will have specific entry and exit points for construction traffic.

The cleaning of public roads in and around the subject site will be undertaken as required.

Particular local constraints include

- Ulster Canal Greenway. The Greenway Route shall be maintained open through the works as much as possible during this phase and the opening of the permanent realigned route shall be prioritized. Given the constrained nature of the section it is however anticipated that some short term diversions of the Greenway will be required to ensure safe separation between greenway users and construction works (See Section 0).
- The Monaghan Harps GAA (MHG) Club currently uses a single access point, which will be obstructed by the new road construction and therefore is being replaced with a new access. Temporary traffic flow arrangements will be implemented to maintain access for the MHG Club at all times (See Section 0).
- Existing informal pedestrian routes which cross the site will be maintained as much as possible but may be subject to short term closures/diversions to ensure safety.

8 SOILS AND GEOLOGY

The works will include stripping of topsoil and excavation of subsoil layers. These activities have potential to expose the soils and geological environment to pollution.

The contractor shall obtain approval of their proposed erosion and sediment control measures from MCC's Environment Section prior to commencing works on site.

The following measures are to be implemented in order to mitigate such risks.

8.1 Vehicles

- Earthworks plant and vehicles delivering construction materials to site shall be confined to predetermined haul routes around the site. Vehicles wheel wash facilities shall be installed.

8.2 Stripping of Topsoil

- Stripping of topsoil shall be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the works.
- At any given time, the extent of the topsoil strip (and consequent exposure of subsoil) shall be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles shall be protected for the duration of the works and not located in areas where sediment-laden runoff may enter existing surface water drains.

8.3 Excavation of Subsoil Layers

- The duration that subsoil layers are exposed to the effects of weather shall be minimised. Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of foundations and completion of landscaping).

8.4 Excavation of Rock

While site investigation indicates that rock excavation is not anticipated to be required for the proposed works, measures to be taken in the event of encountering rock are set out in any case

- Where bedrock is encountered in excavations, it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site.

- Rock will typically be excavated using rock breakers or blasting where adequate separation distance can be achieved to existing properties. Rock-breaking procedures are to be agreed with MCC prior to commencement.
- The duration that bedrock is exposed to the effects of weather shall be minimised. Disturbed bedrock layers shall be backfilled as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of foundations and completion of landscaping).

8.5 Temporary Storage

All stripped topsoil, excavated subsoil, and rock shall be stored on-site to prevent double handling. The stockpiles shall be protected for the duration of the works.

Stockpiles of the stripped subsoil material, excavated subsoil, and rocks shall be stored separately in suitable locations identified for temporary storage.

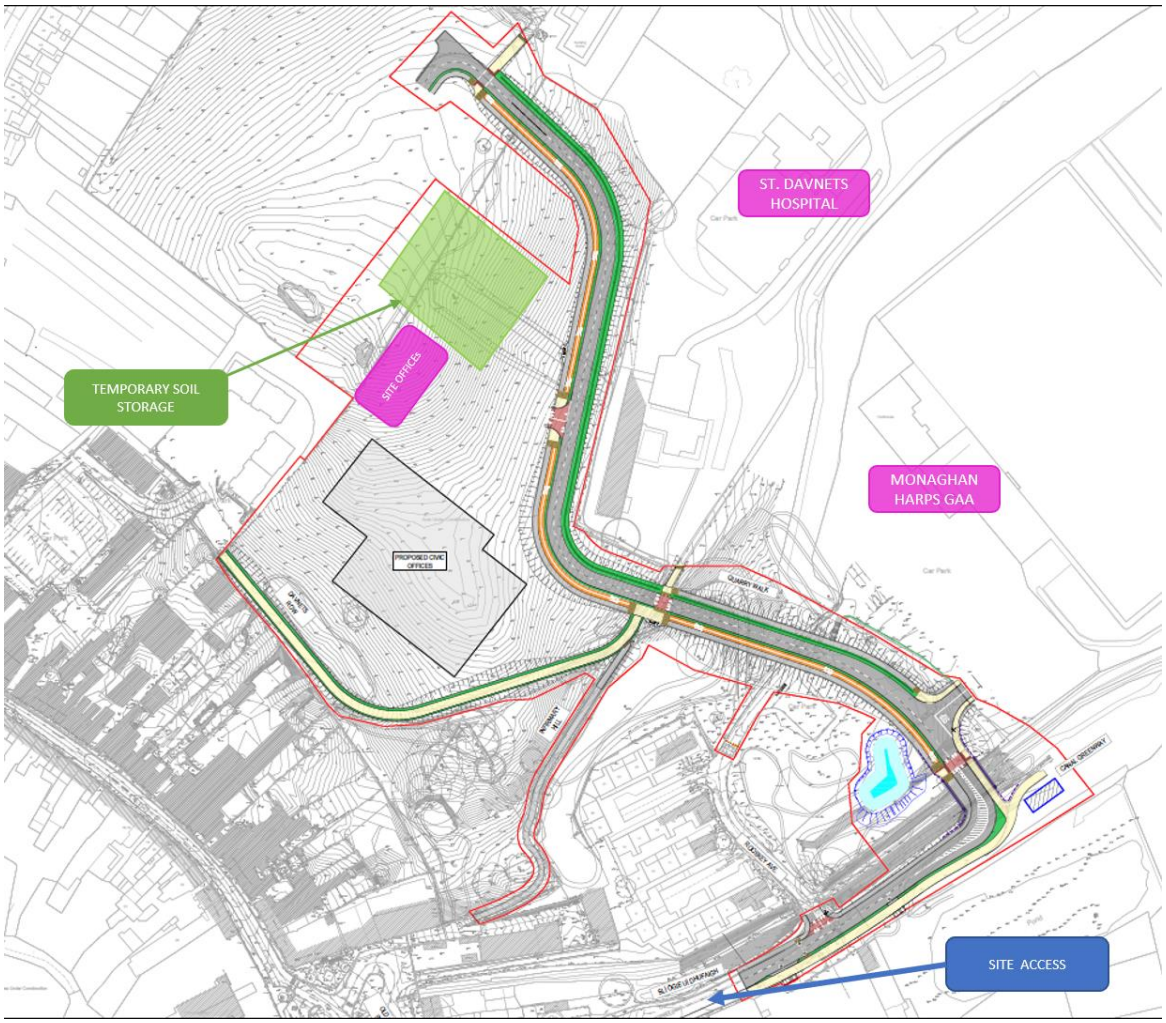

Figure 8-1:Temporary soil storage locations

8.6 Weather Conditions

- Typical seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion.

8.7 Other Mitigation Measures

- All materials exported from site shall be in accordance with the Waste Management Acts.
- Imported materials to be suitably separated to avoid contamination or mixing.
- For imported materials, the use of local quarries or locally available material should be prioritised.
- Any potential for use of surplus material within local sites shall be pursued at construction and detailed design stage (subject to compliance with Waste Management Acts). If any material is to be reused on another site as a by-product (and not as waste), this will be done in accordance with Article 27 of the Waste Directive Regulations.
- An Emergency Response Plan shall be prepared by the contractor which contains measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events.

9 WATER

The following measures are to be implemented during the construction phase to mitigate risks to the water and hydrogeological environment.

9.1 Erosion and Sediment Control

- Construction stage drainage shall include erosion and sediment control design which will be used to control drainage and silt management on the site. (e.g. sediment retention ponds, surface water inlet protection, silt fencing and signage around specific exclusion zones)
- Groundwater pumped from excavations shall be directed to on-site settlement ponds from where it slowly infiltrates.
- Discharge from any vehicle wheel wash areas shall be directed to on-site settlement ponds.
- No outflows or dewatering flows from the works area will discharge directly into watercourses.
- Weather conditions and seasonal weather variations shall be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.

9.2 Accidental Spills and Leaks

- In order to mitigate against spillages contaminating underlying soils and geology, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. These areas shall be bunded (to min 110% of chemical volume) and will be located away from surface water drainage.
- Refuelling and servicing of construction machinery shall take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).
- An Emergency Response Plan detailing the procedures to be undertaken in the event of a spillage of chemical, fuel or hazardous wastes will be prepared prior to construction.
- Pouring of concrete including wash down and washout of concrete from delivery vehicles shall be controlled in an appropriate facility to prevent contamination.

- Regular samples shall be taken from soils affected by earthworks which shall be analysed for contamination.

9.3 Bridge Works

To minimise the effect of culvert works, the following mitigation measures shall be implemented.

- Design and construction of watercourse crossings shall be in accordance with best practice guidance and in particular with "Guidelines On Protection Of Fisheries During Construction Works In And Adjacent To Waters " (Inland Fisheries Ireland) and "Guidelines For The Crossing Of Watercourses During The Construction Of National Road Schemes"(National Roads Authority (NRA)).
- Relevant fisheries authorities shall be informed of all in-stream construction work scheduled to take place. Any in-stream or culverting works shall be undertaken in consultation and with the agreement of the relevant statutory body and during the permitted times of the year.
- All watercourse crossings will be subject to Office of Public Works (OPW) Section 50 agreement.
- Watercourse crossings inverts shall be bottomless to facilitate a natural bed of river material.
- Construction of watercourse crossings and stream works shall be programmed to coincide with periods of predicted low flow in the affected channel and shall take notice of other working period restrictions imposed. Construction shall be strictly as per the design for the watercourse crossing.

9.4 Monitoring

The contractor shall carry out water quality monitoring upstream and downstream of the works prior, during and post construction. The water monitoring will be compared against the baseline results and current Environmental Quality Standards (EQS). Thresholds levels are noted below;

- The pH of any and all discharges made from and during construction woks shall be in the range of 6.0 – 90. Units and not alter the pH of any receiving fisheries waters by more than +/- 0.5 pH units.

- The level of suspended solids in any discharge as a result of construction work shall not exceed 25mg/l, nor result in the deposition of silts on gravels or any element of the aquatic flora or fauna.

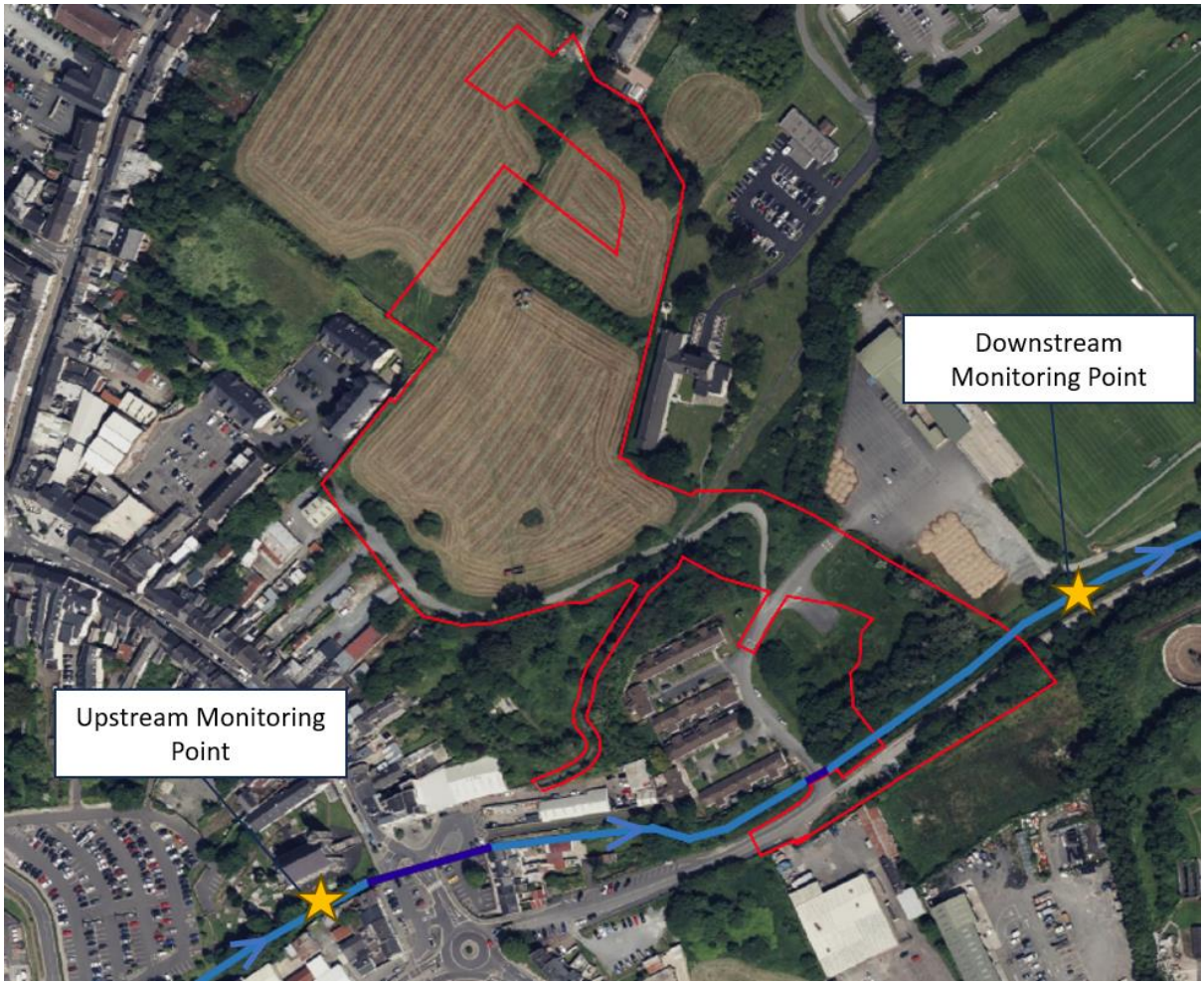

Figure 9-1:Water Quality Monitoring Points (approximate)

10 UTILITIES

The following measures are to be implemented during the construction phase in order to mitigate risks to the water supply, drainage and utilities.

- The construction compound shall include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a temporary connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be located where it is protected from contamination by any construction activities or materials.
- A competent contractor shall be appointed to undertake the works and protect existing systems from damage during construction.
- Relocation of existing ESB infrastructure shall be fully coordinated with ESB Networks to ensure interruption to the existing power network is minimized (e.g. agreeing power outage to facilitate relocation of cables). Ducting and / or poles along proposed relocated routes will be constructed and ready for rerouting of cables in advance of decommissioning of existing power lines.
- Similarly, connections to the existing utility Renetworks shall be coordinated with the relevant utility provider to reduce outages and carried out by approved contractors.
- Diversion of an existing Irish Water watermain crossing the location of the office building will commence by laying of the diverted pipe in Phase 2 alongside the roadway and it will be completed at the start of Phase 4 when the tie-ins to the existing pipe are made. The original pipe can then be removed.

10.1 Watermain Diversion Works

The decommissioning of asbestos cement watermain pipes will be executed with the utmost care and adherence to regulatory requirements in accordance with best practice guidance, including 'Asbestos-containing materials (ACMs) in Workplaces' (Health and Safety Authority, 2013).

The following measures are to be implemented to mitigate risk to the community and environment:

- Contractor to ensure an advanced notice to stakeholders for possible service disruptions due to construction.

- Alignment of these pipes to be demarcated and waste management procedures for asbestos removal and handling prepared.
- Asbestos waste temporarily stored onsite to be separated from all other waste material with limited access to authorized personnel only. Warning labels to be fixed to all asbestos waste containers.
- A record of asbestos waste disposal should be kept on file. Asbestos waste to be disposed of appropriately and to a certified landfill.

Contractor to ensure to focus on risk assessment, containment, proper handling, and stakeholder communication to ensure that this process will be conducted safely, protecting both the environment and the community.

11 ECOLOGY

An Appropriate Assessment and an Ecological Impact Assessment has been carried out of the subject site by 'Flynn Furney Environmental Consultants' and is submitted with this application.

The contractor shall comply with particular mitigation measures for this topic as set out in the EcIAR for the development. Reference should be made to this specialist report and all construction works proposed shall take account and adopt the relevant recommendations outlined in the report.

12 ARBORICULTURE

A Tree survey has been carried out of the subject site by 'Dr Philip Blackstock' and is submitted with this application.

The contractor shall comply with particular mitigation measures for this topic as set out in the Tree Survey Report for the development. Reference should be made to this specialist report and all construction works proposed shall take account and adopt the relevant recommendations outlined in the report.

13 ARCHAEOLOGY & BUILT HERITAGE

Archaeological testing has been carried out of the subject site by James Kyle and is submitted with this application.

The contractor shall comply with particular mitigation measures for this topic as set out in the Archaeology & Built Heritage Report for the development. Reference should be made to this specialist report and all construction works proposed shall take account and adopt the relevant recommendations outlined in the report.

14 NOISE AND VIBRATION

During the works the contractor shall comply with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) as well as Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.

In particular, the following practices will be implemented during the construction phase:

- Erection of a barrier (e.g. Standard 2.4m high construction hoarding) to remove direct line of sight between noise source and receiver when construction works are being carried out in proximity to noise sensitive receivers.
- Establishing channels of communication between the contractor, local authority and residents.
- Appointing a site representative responsible for matters relating to noise.
- A noise and vibration monitoring specialist will be appointed to periodically carry out independent monitoring of noise and vibration during random intervals and at sensitive locations for comparison with limits and background levels.
- Selection of plant with low inherent potential for generation of noise.
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints and implementation of noise reduction measures such as acoustic enclosures.
- Avoid unnecessary revving of engines and switch off plant when idle.
- All vehicles and mechanical plant used for the purpose of the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. In addition, all diesel engine powered plant shall be fitted with effective air intake silencers.
- All ancillary pneumatic percussive tools shall be fitted with mufflers or silences of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.

14.1 Noise Limits

Noise Limits to be applied for the duration of construction works are as set out in the National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Roads Schemes

(summarised below in Figure 9.1) and BS 5228-1:2009+A1:2014 (Code of Practice for Noise Control on Construction and Open Sites).

Date	Noise Level (dB re $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{AFmax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Figure 14-1: NRA Guidelines: Max. Noise Levels at Façade of Dwellings During Construction

BS 5228 applies a noise limit of 70 dBA between 07:00 am and 19:00 pm outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise.

For the duration of construction works, a daytime noise limit (07:00 am to 19:00 pm) of 70 dBA shall apply (in accordance with the requirements of BS 5228 and generally in agreement with the NRA guidelines).

14.2 Vibration Limits

Vibration Limits to be applied for the duration of construction works are as set out in BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385: 1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration). Allowable vibration during the construction phase is summarised below.

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 4Hz	15 to 40Hz	40Hz (and above)
12 mm/s	12.5 mm/s	50 mm/s

Figure 14-2: Allowable Vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration

15 AIR QUALITY, DUST AND CLIMATE CHANGE

The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed construction phase mitigation measures are implemented and that construction impacts and nuisance are minimised. The following mitigation measures are to be implemented during the construction phase:

- During working hours, dust control methods shall be monitored as appropriate, depending on the prevailing meteorological conditions.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details.
- Community engagement shall be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses.
- A complaints register shall be kept on site detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out.
- A speed restriction of 20 km/hr shall be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Access gates to the site shall be located at least 10m from sensitive receptors.
- Bowsers or equivalent watering equipment shall be available during periods of dry weather throughout the construction period. Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use.
- Any hard surface roads shall be swept regularly to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust. During periods of very high

winds (gales), construction activities likely to generate significant dust emissions should be postponed until the gale has subsided.

- Overburden material shall be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors.
- Vehicles delivering or collecting material with potential for dust emissions shall be always enclosed or covered with tarpaulin to restrict the escape of dust.
- At the main construction traffic exits, a wheel wash facility shall be installed. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.
- It is recommended that dust deposition monitoring be put in place to ensure dust mitigation measures are adequately controlling emissions. Dust monitoring should be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.

A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM10 are not exceeded. Where levels exceed specified air quality limit values, dust

generating activities shall immediately cease and alternative working methods shall be implemented.

16 WASTE MANAGEMENT

It is proposed that from the outset of construction activities, a dedicated and secure compound containing bins, and/or skips, and storage areas, into which all waste materials generated by construction site activities, will be established within the active construction phase of the development site.

In order to ensure that the construction contractor correctly segregate waste materials, it is the responsibility of the site construction manager to ensure all staff are informed by means of clear signage and verbal instruction and made responsible for ensuring site housekeeping and the proper segregation of construction waste materials.

It will be the responsibility of the Project Construction Manager to ensure that a written record of all quantities and natures of wastes exported -off site are maintained on-site in a Waste File at the Project office.

It is the responsibility of the Project Construction Manager or his/her delegate that all contracted waste haulage drivers hold an appropriate Waste Collection Permit for the transport of waste loads and that all waste materials are delivered to an appropriately licenced or permitted waste facility in compliance with the following relevant Regulations:

- Waste management (Collection Permit)
- Waste Management (Collection Permit) Amendment Regulations 2008 (SI No. 87 of 2008)
- Waste Management (Facility Permit and Registration) regulation S.I.821 of 2007 and Waste Facility Permit under the waste Management (Facility Permit and Registration) Amendment Regulations S.I 86 of 2008

Prior to the commencement of the project, the Project Construction Manager shall identify a permitted Waste Contractor who shall be employed to collect and dispose of all wastes arising from the project works. In addition, the Project Construction Manager shall identify and all waste licensed / permitted facilities that will accept all expected waste exported off-site and will maintain copies of all relevant Waste Permits / Licences as required.

All waste soils prior to being exported off-site, shall be classified as inert, non-hazardous or hazardous in accordance with the EPA's Waste Classification Guidance – List of Waste & Determining if Waste is Hazardous or Non-Hazardous document dated 1st June 2015 to ensure

that the waste material is transferred by an appropriately permitted waste collection permit holder and brought to an appropriately permitted or licensed waste facility.

16.1 On-Site Waste Reuse and Recycling Management

Construction waste material such as soils, damaged or broken concrete slabs, blocks, bricks and tiles generated that is deemed by the Project Engineer to be suitable for reuse on the Project site for ground-fill material and landscaping. This initiative shall provide a positive environmental impact to the construction phase as follows:

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

16.2 Waste Storage Compound

A waste storage compound shall be set up on-site from the commencement of site activities. The compound shall include the following:

- Separate waste skips labelled with signage stating the nature of waste materials that can only be placed in the skips
- Waste oils / containers shall be placed in dedicated mobile bunds units.
- Soils contaminated by accidental on-site spillages of oils / construction hydrocarbons shall be stored in clearly identified hazardous waste storage containers.
- Spill kits with instructions shall be located in the waste storage compound.

16.3 Soils

The subject development site is currently greenfield and undeveloped.

Top and subsoils shall be re-used on-site for landscaping purposes to minimise the volume of soils to be exported off-site.

Excess soils shall be exported to an appropriately waste permitted/licenced facility.

Excavated excess soils that are required to be exported off-site may be suitable for re-use in other construction sites and may be declared as a by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011. Article 27 requires that the material classified not a waste but a by-product must meet specific criteria and that that a declaration of a material as a by-product is notified to the EPA.

16.4 Contaminated Soils

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the 2002 Landfill Directive (2003/33/EC) for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site to an appropriately licenced facility for treatment/disposal.

The following measures are to be implemented during the construction phase in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle waste in such a manner as to minimise the effect on the environment:

- Building materials should be chosen with an aim to 'design out waste'.
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that, Concrete rubble; Plasterboard; Metals; Glass; and Timber, at a minimum, will be segregated:
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;

- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

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