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OUTLINE
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

ST KEVIN'S STRATEGIC HOUSING DEVELOPMENT

AT THE FORMER

ST. KEVIN'S HOSPITAL

SHANAKIEL

CORK

Prepared For: -

The Land Development Agency

Prepared By: -

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TABLE OF CONTENTS

	<u>PAGE</u>
1 INTRODUCTION	1
1.1 LIMITATIONS	1
2 PROJECT DESCRIPTION	2
2.1 SITE DESCRIPTION	2
2.2 DEVELOPMENT DESCRIPTION	2
3 METHOD STATEMENT FOR CONSTRUCTION.....	6
3.1 SITE PREPARATION WORKS	6
3.2 CONSTRUCTION COMPOUNDS.....	6
3.3 EXCAVATION WORKS	8
3.4 POTENTIAL FOR HISTORIC CONTAMINATION ON THE SITE	8
3.5 CONSTRUCTION OF SERVICES.....	8
4 ENVIRONMENTAL IMPACTS AND ALLEVIATION MEASURES	9
4.1 INTRODUCTION.....	9
4.2 NOISE.....	9
4.3 VIBRATION.....	12
4.4 DUST	12
4.5 CARBON EMISSIONS	15
4.6 LAND, SOILS AND GROUNDWATER	15
4.7 SURFACE WATER	16
4.8 BIODIVERSITY	20
4.9 LANDSCAPE AND VISUAL.....	21
4.10 WASTE MANAGEMENT PLAN.....	21
5 ENVIRONMENTAL EMERGENCY RESPONSE PLAN	25
6 REFERENCES	27

APPENDIX -1

Cut & Fill Drawing BMCE

Project		Construction Environmental Management Plan (CEMP)		
		Former St Kevin's Hospital Shanakiel, Cork.		
Client		Land Development Agency		
Report No	Date	Status	Prepared By	Reviewed By
20-035-01	08/04/2020	Draft 1	S Moran	J O'Callaghan
	20/04/2020	Outline	S Moran	J O'Callaghan
	10/11/2020	Outline Rev A	S Moran	J O'Callaghan
	24/11/2020	Outline Rev B	S Moran	J O'Callaghan
	26/11/2020	Outline Rev C	S Moran	J O'Callaghan
	01/12/20	Outline Rev D	S Moran	J O'Callaghan
	02/12/20	Outline Rev E	S.Moran	J'O'Callaghan

1 INTRODUCTION

It is proposed to construct a residential development on the grounds of the former St Kevin's Hospital, which is part of a campus known as Our Lady's Hospital in Shanakiel, Cork City. The proposed development covers 5.7 ha and the development footprint is 2.43ha.

O'Callaghan Moran & Associates has prepared this Outline Construction Phase Environmental Management Plan (CEMP) for the proposed development on behalf of the Land Development Agency (LDA). It includes a description of the proposed works, identifies the control measures to alleviate impacts and specifies an environmental monitoring programme. It has been prepared in consultation with the multi-disciplinary design team including;

- Barret Mahony Consulting Engineers
- DCON Safety Consultants
- Openfield Ecological Services
- Tom Phillips & Associates, Planning Consultants

1.1 Limitations

This document is the outline CEMP for the Development. It will form the basis of the final CEMP which will be prepared by the appointed construction contractor (Contractor).

2 PROJECT DESCRIPTION

2.1 Site Description

The site is located on the north side of the River Lee (Figure 2.1) and is accessed from Shanakiel Road along the north east site boundary. It currently comprises a series of partially demolished and fire damaged buildings on different levels.

The buildings that were in the north of the site have already been demolished and the debris removed. Of the remaining buildings - St. Dymphna's Hospital, a portion of the Link Corridor Building, the former Doctors House, Mortuary and other ancillary outbuildings will be demolished. A central feature section of the Link Corridor, St Kevin's Hospital (A Protected Structure Ref. No PS260) in the south-east of the site along with the rising walls up to sill level, and the former Chapel in the south-west will be retained. There is a green area in the south of the site that will also be retained.

2.2 Development Description

The Land Development Agency intend to apply to An Bord Pleanála (the Board) for permission for a Strategic Housing Development with a total application site area of c. 5.7 ha, on lands located at the Former St. Kevin's Hospital and Grounds, Shanakiel, Cork (A Protected Structure, 'Our Lady's Hospital' RPS Ref. PS620). The development, with a total gross floor area of c 24,344 sq m, will provide 266 no. residential units, a crèche and office enterprise centre. The development will consist of 46 no. town houses (32 no. 3 bedroom units and 14 no. 4 bedroom units) arranged in 11 no. two storey blocks; 54 no. ground floor 2 bedroom duplex apartments and 36 no. 3 bedroom and 18 no. 4 bedroom duplex townhouses above arranged in 7 no. three storey blocks and 52 no. walk-up apartments (11 no. 1 bedroom apartments and 41 no. 2 bedroom apartments) arranged in 3 no. four storey blocks. The development will also include the stabilisation, conversion, renovation and internal reordering (including new structural frame and floors) of the former St. Kevin's Hospital building to provide 60 no. apartments (26 no. 1 bedroom and 34 no. 2 bedroom apartments) a 440 sq m crèche at ground floor level, with ancillary outdoor play area and the conversion of the 630 sq m former chapel building to provide a new Office Enterprise Centre. The proposed development will include 241 no. surface car parking spaces and 563 no. bicycle parking spaces.

The development will also consist of the demolition of 2,901 sq m of former hospital buildings and associated outbuildings (including the demolition of the 1,129 sq m former two storey St. Dymphna's Hospital block; 672 sqm of the rear toilet blocks and contemporary stair cores to the side and rear of the St. Kevin's Hospital building; the 220 sq m two storey former Doctors House; the 50 sq m one storey hospital mortuary building; 480 sq m of shed buildings to the rear of the Chapel; the 151 m retaining wall to the immediate south of the St. Kevin's Hospital

building and the partial demolition of the existing 350 sq m link corridor structure, to be replaced with an integrated landscaped amenity area in the footprint of the original structure.) 2 no. new 228 sq m extensions with bridge access are to be provided to the rear of the St. Kevin's Hospital Building and 2 no. 31 sq m new glazed porch extensions to the south.

The development will also include the provision of a play area to the immediate east of St. Kevin's Hospital; private, communal and public open space (including all balconies and terraces at all levels); internal roads and pathways; pedestrian access points; hard and soft landscaping; boundary treatments including the repair of some existing boundary walls; the provision of new surface water and foul drainage pipes and any associated pipe diversion works; new retaining walls; a new internal access road; changes in level; services provision and related pipework; electric vehicle charging points; attenuation tanks; SUDS; signage; the upgrading of the existing access from Beechtree Avenue; public lighting and all site development and excavation works above and below ground.'



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Figure 2.1 Site Layout

Legend



-Site Layout

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Client:

Barrett Mahony Consulting Engineers

Figure 2.2 Proposed Site Layout (Reddy Architecture)



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REV	DATE	DRN	ISSUE
001	2020/12/04	AD	Issued for Planning

ORIGINAL SHEET SIZE = A1

NOTES

- 54 Duplex Apartments
- 54 Duplex Townhouses
- 46 Townhouses
- 52 Apartments
- 60 Apartments St. Kevin's

Total 266 Units

FOR LANDSCAPE DETAILS PLEASE REFER TO AECOM'S LANDSCAPE DRAWINGS

FOR ENGINEERS' DETAILS PLEASE REFER TO BARRETT MAHONY ENGINEERS DRAWING

PLANNING

St Kevin's Strategic Housing Development
At the former St. Kevin's Hospital and Grounds
Shanakiel, Cork

CLIENT
LDA
Land Development Agency

DRAWING
Site Layout Plan
A3

DATE	2020/12/04	SCALE	1:1000 @ A3
DRN	A.O'Calla	CHECKED	S.Kearns

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P19-194C-RAU-00-ZZ-DRA-31201		P01

3 METHOD STATEMENT FOR CONSTRUCTION

The DCON Safety Consultants CMP provides a detailed description of the construction programme.

3.1 Site Preparation Works

Site preparation works will include the 'site establishment' set up by the Contractor which will include the following:

- Setting up of access control to the site;
- Secure compounds for the storage of all on-site machinery and materials;
- Permanent and temporary hoarding/fencing; and
- Erection of signage.

Prior to commencement of construction, the Contractor will consult records and drawings to establish the location of existing buried services/utilities. Where it is necessary to disconnect services/utilities during the construction works for a notable period, temporary provisions will be provided.

3.2 Construction Compounds

The suggested location of the construction compound is shown on Figure 4.1 but this is subject to confirmation by the appointed contractor. The compound will include offices, accommodation and welfare facilities. They will be serviced with electrical power, water supply and toilet facilities.

Haul routes and storage/staging areas will be established. The storage/staging areas will vary depending on plot spatial allocation and their exact locations will be decided taking ecological and archaeological features into consideration. Suitably robust hoarding will be erected around the perimeter of each storage/staging area to a height of 2.40 m.



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Figure 4.1 Construction Compound Rev B

Client:

Barrett Mahony Consulting Engineers

Legend



-Site Layout

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3.3 Excavation Works

It is estimated that 33,221 m³ of soil and stone will be excavated. 14751m³ will be rock and 18,470m³ will be soils. Some of the cut material will be retained on-site as fill, but the bulk of the excavated material (27,402m³) will be removed from the site. A Drawing showing where cut and fill will occur on site which was prepared by Barret Mahony Consulting Engineers is included in Appendix 1.

3.4 Potential for Historic Contamination on the Site

Causeway Geotech has completed a soil testing programme to establish baseline soil quality. Forty soil samples were collected and sent for laboratory analysis. The testing results show that nothing of environmental significance was detected in the subsoils and that the soils are uncontaminated. The test results will be used to complete a waste classification assessment and prepare dig plan. The plan will identify the type of facilities to which the excavated soils can be sent for recovery/disposal. Any contaminated soils identified will be removed as part of the site preparatory works programme.

3.5 Construction of Services

3.5.1 Electrical Connections

The site compound requires power for temporary lighting and temporary signals during the works. If a connection to the existing network is not available a generator will be used.

3.5.2 Surface Water/Drainage System

Temporary construction surface drainage and sediment control measures will be provided before earthworks commence.

4 ENVIRONMENTAL IMPACTS AND ALLEVIATION MEASURES

4.1 Introduction

The construction stage will generate emissions and these include emissions to air (dust, noise and vibration), construction traffic exhaust gases, surface water run-off or infiltration to groundwater. In addition, leaks or spills from fuel storage areas and construction plant and equipment have the potential to impact on soil, surface water and groundwater quality.

The CEMP specifies emission limits for the various environmental media that require monitoring and are based on best practice guidance for the respective media. They include Trigger and Action Limits the details of which are discussed further in the relevant subsections below. Where trigger limits are exceeded, measures are required to ensure construction operations are reviewed to reduce noise levels. Where action levels are exceeded, works must cease until such measures reduce the noise levels to acceptable limits.

The Contractor will be required to revise this Outline CEMP prior to the start of construction and to assign responsibility to a Site Engineer for ensuring compliance with the CEMP.

4.2 Noise

The construction stage will involve site clearance, building demolition works, excavation and removal of soil and bedrock and the construction of buildings and structures. A variety of items of mobile plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors, generators and pile drivers. There will be vehicular movements to and from the site along Shanakiel Road.

A range of measures will be employed to minimise the potential noise and vibration disturbance in the surrounding area and to ensure compliance with the construction noise and vibration limits recommended in the Transport Infrastructure Ireland (TII) document *'Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes'* 2014 and BS 5228 (2009+A1:2014) *Code of practice for noise and vibration control on construction and open sites – Noise and vibration*.

The measures include, but are not limited to;

- Hours of work - all construction related works, other than emergency works and security will be carried out during normal construction working hours.
- Selection of quiet plant/location of plant; plant which will have the least impact in term of noise will be selected.

- Plant will only be left running during works and will be switched off at all other times i.e.no idling. Maintenance or repair to plant or machinery will not be carried out outside of the permitted construction works hours.

Table 4.1 show the noise limits proposed for pre-construction and during routine construction noise monitoring. They were established having regard for NRA Guidelines 2014. They include for Trigger and Action Limits.

Table 4.1 Trigger and Action Noise Monitoring Limits

Days & Times	$L_{Aeq} (1hr) \text{ dB}$	$L_{pAmax, slow} \text{ dB}$
Monday to Friday 08:00 to 19:00hrs Trigger	63	72
Monday to Friday 08:00 to 19:00hrs Action	70	80
Saturday 08:00 to 14:00hrs Trigger	58.5	67.5
Saturday 08:00 to 14:00hrs Action	65	75

A noise and vibration monitoring regime will be implemented for the duration of the construction stage. At a minimum the regime will include;

Baseline on site noise monitoring will be undertaken prior to the commencement of the construction at the monitoring stations shown on Figure 5.1.

During the construction phase monitoring will be undertaken inside the hoardings. Measurements will also be conducted outside the hoarding at the nearest noise sensitive source to establish background noise emission levels i.e. those likely to be associated with traffic or other activities not related to the construction programme.

The monitoring will be undertaken weekly, but the frequency may be amended where complaints are received or where trigger limits are exceeded.

Where action limits are exceeded works will be suspended in the relevant area(s) until the issues causing the exceedances are identified and alleviated.

All monitoring data will be compiled into a monthly technical monitoring report by the Contractor's Site manager (SM) for review and approval by the clients Environmental Monitoring Officer. The report shall be based on BS5228 "Noise Control on Construction and Open Sites".



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Figure 5.1 Proposed Monitoring Locations for Noise and
 Vibration Rev A

Client:

Barrett Mahony Consulting Engineers

Legend



-Site Layout



-Noise and Dust
 Monitoring Locations

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A log will be maintained on site of all noise complaints including those actions taken where trigger limits are exceeded. The log will include the following detail;

- Name and address of complainant
- Time and date complaint was made
- Date, time and duration of noise
- Characteristics, such as rumble, clatters, intermittent, etc.
- Likely cause or source of noise
- Weather conditions, such as wind speed and direction
- Investigative and follow-up actions

4.3 Vibration

Dilapidation surveys of certain properties adjoining the site shall be undertaken prior to any works commencing on site. The results of these survey will inform any specific requirements in terms of potential locations for vibration monitors particularly during the rock excavation phase.

4.4 Dust

Dust emissions are likely to arise from the following activities:

- Earthworks;
- Wind blow from temporary stockpiles;
- Handling of construction materials;
- Landscaping; and
- Construction traffic movements.

Based on the assessment criteria presented in the TII document '*Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes*' 2011, the site is considered to be at a 'major' scale. This category has the potential for significant soiling impacts within 100m; Particulate Matter (PM₁₀) impacts within 25m; and vegetation impacts within 10m of the site boundary if standard alleviation measures are not in place.

The following control measures will be implemented at a minimum:

- Spraying of exposed earthwork areas and site haul roads during dry weather using mobile bowser units;
- Provision of spray booths to clean wheels of trucks at exit points during soil and stone removal programme;
- Provision of a wheel wash for all other construction site activities.
- Control of vehicle speeds and speed restrictions;
- Sweeping of hard surface roads.

The following measures will also be implemented where construction works occur in proximity to sensitive receptors:

- Provision of hoarding of 2.40m high at a minimum;
- Covering of stockpiles and locating stockpiles away from sensitive receptors;
- Locating plant away from sensitive receptors.

Alleviation measures will be implemented during rock crushing if/when this is undertaken in accordance with measures outlined in the DEFRA Process Guidance Note 3/16(12) Statutory guidance for mobile crushing and screening, September 2012 and will include:

- Provision of sprinklers on mobile crusher.
- Locating crushing plant as far from sensitive receptors as possible (minimum of 200m). The crusher will be located away from all potentially sensitive receptors. The crushing plant will be fully enclosed and ducted to a dust extraction and collection system such as a fabric filter.

The following avoidance, remedial or reductive measures will be implemented as part of the dust minimisation plan:

- Vehicle speed limits will be enforced at the construction site. Site traffic is restricted to 10 km/hr to minimise the occurrence of dust re-suspension.
- Vehicles delivering or removing materials on site will be loaded carefully to reduce the risk of spillage from the vehicles onto nearby roads.
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor through regular servicing of machinery.
- Surrounding public roads used by trucks to enter and leave the site will be inspected regularly and cleaned, using an approved mechanical road sweeper, when required and subject to local authority requirements. Site roads will be cleaned on a daily basis, or more regularly, as required.
- During very dry periods when dust generation is likely or during windy periods, construction areas and vehicles delivering material with dust forming potential will also be sprayed with water, as appropriate.
- Wheel wash facilities will be provided where required for all other construction activities for use by all vehicles exiting the site prior to them entering onto the surrounding public roads.
- Areas where materials will be handled and stockpiled will be positioned away from main site access roads. These areas will also be designed to minimise their exposure to wind – all stockpiles shall be kept to the minimum practicable height with gentle slopes.
- There shall be no long-term stockpiling on site and storage time will be minimised.
- Material drop heights from plant to plant or from plant to stockpile will be minimised.
- Daily inspections will be undertaken to monitor tidiness.

- A regular program of site tidying will be established to ensure a safe and orderly site.
- If necessary, scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind.
- Food waste will be strictly controlled on all parts of the site.
- Loaded Lorries, delivery vehicles and all trucks for the movement of materials on and off site will be covered. Skips will also be covered. The contractor will ensure that delivery agents are compliant in this regard.
- Surrounding roads used by trucks to access to and egress from the site will be inspected regularly and cleaned, using an approved mechanical road sweeper, when required. Roads will be cleaned subject to local authority requirements. Site roads will be cleaned on a daily basis, or more regularly, as required.
- Road edges and footpaths will be cleaned using a hand broom with controlled damping.
- In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed of in the normal manner.

The degree of implementation for some of the above measures (water spraying etc) will be determined by rainfall levels on site. The use of excessive levels of water to suppress dust will be minimised to limit potential drainage related impacts on site.

4.4.1 Dust Monitoring;

Dust deposition monitoring will be carried out at the nearest sensitive receptors for the duration of the construction works to ensure the effectiveness of the measures outlined above. Bergerhoff dust deposit gauges will be positioned at each sensitive receptor. Indicative locations are shown on Figure 5.1 and these are subject to review and adjustment as the works progress. The precise location of the dust monitoring gauges will be determined by a qualified air quality expert appointed by the Contractor to ensure that locations are appropriate at a site specific level.

The guideline dust deposition limit is 350 mg/m²/day (averaged over a 30-day period). This limit is widely applied by the EPA and local authorities in the assessment of dust nuisance.

The reports will be maintained on site for inspection if/when required by the local authority.

Where exceedance of dust emission limits occur or where complaints are received an assessment will be undertaken to identify the source(s). This will include the nature of construction works, potential off site sources and meteorological conditions.

Should the construction works be identified as the primary cause of the exceedance, the Contractor will ensure that the alleviation measures are improved. Should exceedances of the guideline limit value continue to occur following these improvements, the Contractor will provide alternative measures and/or will modify the construction works.

4.5 Carbon Emissions

The following measures will be implemented to minimise carbon emissions:

- Materials required for the construction works will be sourced locally where possible. Rock crushing will be undertaken on site, to reduce the requirement to import crushed stone to site.
- The Construction Traffic Management Plan (refer to ILTP Report submitted under separate cover with the Planning Application) will be implemented in full. This will minimise congestion and encourage car sharing and the use of public transport. The construction traffic management plan estimates peak truck movements of 36 in/out per day to remove all of the net excavated material. This will occur over a period of 2.5 months and concludes that the peak level of traffic generated by construction will be small and significantly less than that generated by the completed development. In reality the effect of construction traffic will be even less than that as the development will be built out in 5 phases and so removal of material will be spread out over a much greater time period than 2.5 months.
- Materials will be handled efficiently on site to minimise the waiting time for loading and unloading, thereby reducing potential emissions.
- Engines will be turned off when machinery is not in use.
- Regular maintenance of plant and equipment.

The Contractor will be required to implement an Energy Management System for the duration of the works. This will include the following at a minimum:

- Use of thermostatic controls on all heating systems in site buildings
- The use of insulated temporary building structures
- The use of low energy equipment and power saving functions on all computer systems
- The use of low flow tap fittings and showers

4.6 Land, Soils and Groundwater

The following construction management practices will be implemented to minimise the risk of pollution of soil and groundwater:

- The Contractor will not undertake any works within sensitive catchment areas or protection zones. These areas will be clearly fenced off to avoid encroachment by construction plant and equipment.
- Excavation and the stripping of topsoil or the placement of soil stockpiles etc. will not be undertaken until absolutely necessary, as this can lead to sediment run off and leaching of nutrients from soils into nearby waterways. Excavated material shall

undergo earthworks testing in accordance with the TII Specification for Road Works (SRW) to establish its suitability for reuse as engineering fill.

- Appropriate safe slope angles and a suitable drainage system will be used for all excavated slopes, while such slopes will also be monitored by the contractor during the construction works to ensure their stability.
- Where slopes become unstable due to high groundwater table and inflow during construction, pumping locations shall be constructed in order to drain the water table below the level of the granular material and/or cut level for the duration of the construction and slope stability shall be monitored. This will prevent water from flowing from the slope surface and causing erosion.
- Stockpiling of soils on site will be minimised. It is proposed to excavate and load soil and rock directly to haulage vehicles for removal off the site. However, in the event that excavated soils are not immediately reused they will be stockpiled temporarily to minimise the effects of weathering. Care will be required in re-working this material to minimise dust generation, groundwater infiltration and generation of runoff. As part of the development of the Contractors CEMP, the location of stockpiled materials will be agreed with the EMO in advance of placement to ensure they do not impact on surface water courses downstream or sensitive habitats.
- Good housekeeping (daily site clean-ups, use of disposal bins, etc.) on site during construction, and the proper use, storage and disposal of substances and their containers will prevent soil contamination.
- Groundwater pollution will be minimised by the implementation of good construction practices including adequate bunding for all potentially contaminating liquids (fuel and lubricating oils and chemicals).

4.6.1 Groundwater Monitoring

Given the elevated location of the site groundwater management and control measures are unlikely and groundwater drawdown is therefore not considered to be a risk to adjacent buildings side slopes or retaining walls.

The following monitoring will take place where/if required:

- Groundwater level monitoring adjacent to lower ground floor excavations and near sensitive receptors to ensure stability of any temporary slopes, retaining walls and that the zone of influence for dewatering is outside of any protection areas.

4.7 Surface Water

Surface water run-off from construction activities has the potential to become contaminated. The main contaminants arising from surface construction activities include:

- Suspended solids: arising from ground disturbance and excavation;
- Hydrocarbons: accidental spillage from construction plant and storage depots;
- Faecal coliforms: contamination from coliforms can arise if there is inadequate containment and treatment of onsite toilet and washing facilities; and
- Concrete/cementitious products: arising from construction materials.

These pollutants pose a temporary risk to surface water quality for the duration of construction if not properly contained and managed. Suspended solids, which can include silt, affect surface water turbidity and are considered to be the most significant risk to surface water quality from construction activities. Suspended solids can also reduce light penetration, visually impact the receiving water and damage the ecosystem. Potential construction activities that could generate suspended solids include:

- Water removal from surface excavations as a result of rainfall or groundwater seepage;
- Wash Water (Vehicle wheel wash for routine construction activities and Spray Booth during soil and stone excavation and removal programme)
- Runoff from exposed work areas and excavated material storage areas; and
- Cement washdown areas: The potential for cement to increase the pH of water above a neutral range, that is typically pH 6 to 9, could pose a threat to aquatic species living in a watercourse.

Potential activities that could generate the other pollutants listed above include:

- Inappropriate handling and storage;
- Leakage of temporary foul water services; and
- Solid wastes being disposed or blown into watercourses or drainage systems.

4.7.1 *Surface Water Alleviation Measures*

The Contractor will comply with the following guidance documents:

- CIRIA – *Guideline Document C532 Control of Water Pollution from Construction Sites* (CIRIA)
- *Guideline Document C624 Development and Flood Risk -guidance for the construction industry* (CIRIA, 2004).
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*

The following measures will apply for the prevention of pollution to all waters.

- Prepare an Emergency Response Plan detailing the procedures to be undertaken in the event of flooding, a spill of chemical, fuel or other hazardous wastes, a fire, or a non-compliance incident. This plan will contain the following information:
 - Containment measures;
 - List of appropriate equipment and clean-up materials;
 - Maintenance schedule for equipment;
 - Details of trained staff, location, and provision for 24-hour cover;
 - Details of staff responsibilities;

- Notification procedures to inform the relevant environmental authorities;
- Audit and review schedule;
- Telephone numbers of Cork City Council Drainage and Pollution Control Divisions;
- List of specialist pollution clean-up companies and their telephone numbers.
- Ensure site staff are trained in the implementation of the Emergency Response
- Plan and the use of any spill control equipment as necessary;
- Prepare method statements for the control, treatment and disposal of potentially contaminated surface water;
- A procedure for the location and maintenance of soil stockpiles generated during the construction programme;
- Prepare a site plan showing the location of all surface water drainage lines and proposed infiltration areas/discharge to combined sewer. This shall include the location of all existing and proposed surface water protection measures, including monitoring points and treatment facilities;
- Ensure that all appropriate licences required for construction are obtained from the relevant authorities.

The following measures will be used to prevent wash down water from concrete and cementitious material from impacting on surface water:

- All batching and mixing activities will be located in areas away from watercourses and drains;
- Pouring of cementitious materials will be carried out in the dry;
- Pumped concrete will be monitored to ensure no accidental discharge;
- Excess concrete will not be discharged to surface water;
- Surface water drainage around the batching plant will be controlled, subject to a separate Planning Application;
- There will be no hosing into surface water drains of spills of concrete, cement, grout or similar materials; and
- Washout from mixing plant or concrete lorries will be carried out in a designated, contained impermeable area.

Process water used during construction will be disposed of appropriately. Rainwater will also accumulate on the site during construction. This water will be discharged directly via suitable pollution control and attenuation measures either directly to ground within the site or to foul sewer systems via the Cork City Council Sewer network.

De-watering operations and surface water run-off discharge on the site, during construction and prior to completion will be controlled and discharged to the existing sewerage system at an agreed rate of flow as agreed with Irish Water and the Cork City Council Environment Division and Pollution Control Section.

On-site treatment measures will be installed to treat surface water run-off from the site prior to discharge to the receiving surface water sewer. This treatment may include filter strips incorporating Straw Bales to reduce sediment loading, settlement tanks/ponds, the installation of proprietary surface water treatment systems including Class 1 full retention petrol interceptors and spill protection control measures. Settlement tanks/ponds will be sized to deal

with surface run-off and any groundwater encountered. All measures will be approved prior to commencement with the Pollution Section of Cork City Council.

A sampling chamber with shut down valve will be installed downstream of the settlement pond/tank and water quality monitoring will be carried out prior to discharge to nearby watercourses.

4.7.2 Surface Water Monitoring Parameters

As well as daily visual checks on quality the parameters listed in **Table 4.3** will be monitored during construction in accordance with the specified frequencies. This is in accordance with TII 'Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan.' The parameter limit values (Guide/Mandatory) defined in the Freshwater Quality Regulations (EU Directive 2006/44/EEC) should act as trigger values i.e. the monitoring programme should be able to demonstrate compliance with the limit values for all surface water targeted sampling.

Table 4.3: Proposed Surface Water Monitoring Programme during Construction

Parameter	Guide limit	Mandatory limit	Frequency and Manner of Sampling
Temperature		1.5 °C	Weekly, and at appropriate intervals where the works activities associated with the scheme have the potential to alter the temperature of the waters.
pH		6-9	Weekly
Suspended Solids	≤ 25(mg/l)		Monthly
Petroleum Hydrocarbons	5(mg/l)		Monthly (visual)
Total Ammonium	≤ 0.004 (mg/l NH ₄)		Monthly
Electrical Conductivity			Weekly

4.8 Biodiversity

An invasive alien plant species assessment and management plan for the site was prepared by Invasive Plant Solutions in November 2020. This plan was based on site inspections completed in March, May and October 2020. Invasive species were identified in various locations and include Japanese Knotweed, Three Cornered Garlic, Spanish Blue Bell and Rhododendron. The details of the locations and appropriate management are outlined in the above referenced report submitted as part of the planning application.

A number of bat species have been identified on the site as outlined in the Bat Survey report and measures are required during the construction phase of the project to alleviate the impacts. These are outlined in the Bat Survey Report and in the Ecological Impact Statement and include for the erection of bat boxes and a bat monitoring programme. The proposed measures shall be implemented by the contractor prior to and during the construction phase of the project.

4.9 Landscape and Visual

Given the elevated nature of the site it will be visible particularly from the south along the Lee Fields. During the construction phase, all site areas within view of any local dwelling will be enclosed with robust and visually impermeable hoarding to a minimum height of 2.4m unless there are existing walls screening the site from view.

4.10 Waste Management Plan

The purpose of the Plan is to provide information necessary to ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with the current industry standards and regulations, including the Waste Management Act 1996 and the Protection of the Environment Act 2003 as amended.

It is an objective to meet the requirements of the Southern Region Waste Management Plan 2015 – 2021, which in line with the European Union Waste Framework Directive, specifies a mandatory target of 70% of C&D wastes to be prepared for reuse, recycling and material recovery (excluding soil and stones) by 2020.

The Contractor will be required to prepare a Construction and Demolition Waste Management Plan (C&DWMP). The plan shall incorporate best practice guidance, in particular “*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects* (DoEHLG, 2006)”.

Implementation of the plan will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the project.

Where waste generation cannot be avoided this Plan will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact.

The C&DWMP must detail the intended practice for the management of waste arising from the construction and demolition processes and in particular the management of hazardous waste and recyclable materials. In particular the Plan shall address;

Overall Waste Management

- Quantification of waste arising/material surpluses’
- Specific waste management objectives including waste minimisation and the potential to reuse and process materials generated on site in the construction phase;
- Waste handling procedures;
- Waste disposal procedures, including tracking of waste to final destination;
- Waste auditing;

- Record keeping, including gate receipts for waste brought to authorised waste management facilities.

Waste Compound

- Provision of a dedicated and secure compound, containing bins and skips into which all waste generated by construction site activities will be placed;
- Responsibility for provision of signage and verbal instruction to ensure proper housekeeping and segregation of construction waste materials; and
- Responsibility for identification of authorised Waste Contractors who shall be employed to collect and dispose of waste arising from the construction works.

Waste Reuse and Recycling Management

- Identification of potential for reuse of inert wastes; and proposed management measures.

Hazardous Waste

Identification and management of any hazardous wastes likely to arise during the construction process; and

In the event that hazardous soil, or historically deposited hazardous waste is encountered during the work, the contractor must notify Cork City Council Environmental Enforcement Section, and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant alleviation, destination for authorised disposal/treatment, in addition to information on the authorised waste collector(s).

Construction Waste Management

Wastes generated will include broken concrete blocks/tiles/ceramics; surplus bitumen paving; timber and hard plastic off-cuts; metal (aluminium and steel); plasterboard, electrical wire, batteries and damaged equipment; packaging (cardboard, plastic, timber); empty paint tins and adhesive containers; insulation materials; canteen waste from the welfare facilities and waste oil and filters from mobile plant. These are listed in Table 4.4, which also includes the List of Waste (LoW) code (formerly referred to as the European Waste Code or EWC).

Table 4.4 Waste Types

Waste Type	LoW Code
Concrete, bricks, tiles, ceramics	17 01 01-17 01 03 03 & 17 01 07
Soil and Stone	17 05 04
Wood, glass and plastic	17 02 01-03
Bituminous mixtures	17 03 02
Metals (including their alloys)	17 04 01-07
Gypsum-based construction material	17 08 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04

Electrical and electronic components	20 01 35 20 01 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-03
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 20 01 19, 20 01 27 & 20 01 30
Insulation materials	17 06 04

Pending the completion of the detailed design of the of the development and the confirmation of the construction methodologies, it is not possible to estimate with a high level of accuracy the quantities of C&D waste that will be generated from the proposed works. An indication of the likely percentages is shown in Table 4.6

Table 4.6: Waste Types Arising

Waste Types	% By Weight
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	100

The Contractor will nominate an experienced Waste Manager who shall be responsible for the appropriate segregation and storage of all waste arising in the construction stage, including wastes from the staff welfare facilities. The Waste Manager shall be responsible for instructing construction staff on the appropriate segregation and storage of C&D wastes. This may be provided as part of general site training needs such as site induction, health and safety awareness and manual handling.

Dedicated skips will be provided for the following materials:

- Concrete rubble, bricks and tiles
- Plasterboard
- Hard plastic off-cuts
- Timber off-cuts
- Metal off-cuts and rebar
- Glass
- Cardboard and plastic packaging
- Non-recyclable packaging (polystyrene)

- Waste Electrical and Electronic Equipment (wiring, batteries),
- Empty paint tins, adhesive containers and oil cans.

Separate wheelie bins for food waste, mixed dry recyclables and residual waste for wastes arising at staff welfare facilities.

The skips will be located at strategic locations around the construction site as decided by the Waste Manager. The wheelie bins shall be stored adjacent to the construction workers welfare facilities.

The Waste Manager will be responsible for ensuring the skips/bins are removed from the site as required, sent to appropriate waste management facilities and for retaining the relevant records which include

The Waste Manager will maintain a copy of all waste collection permits. A waste classification report is being prepared for the site that will provide information on the type of facilities which soils and stone excavated removed site can be sent. As well as a waste collection docket, a receipt from the final destination of the material will be kept as part of the on-site waste management records.

5 ENVIRONMENTAL EMERGENCY RESPONSE PLAN

Emergency response preparedness will be addressed in detail by the Contractor, in consultation with the development Environmental Health & Safety (EHS) team.

Environmental emergencies at the site requiring intervention include:

- Discovery of a fire within the site boundary;
- Uncontained spillage/leak/loss of containment incident; and
- Discovery of material of archaeological interest.

A list of site emergency contact numbers and the general emergency response actions will be compiled by the Contractor and posted at strategic locations throughout the site, such as the main site entrance, safety stop-boards and contractor cabins.

The emergency contact number list will be updated by the Contractor to include their safety representative contact name and telephone number. An example of emergency response actions is as follows for action to be taken in the event of a spillage:

- IF SAFE, stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- IF SAFE (USE PPE), contain the spill using the absorbent spills material provided. Do not spread or flush away the spill.
- Cover or bund-off any vulnerable areas where appropriate.
- If possible, clean up as much as possible using the absorbent spills materials.
- Do not hose the spillage down or use any detergents.
- Contain any used absorbent material so that further contamination is limited.

Note: This material is a waste and must be treated as such. The Safety Data Sheet (SDS) for the material will determine whether the spill material is hazardous or non-hazardous and will need to be disposed of accordingly.

- Notify the Development Teams Construction Safety Representative at the earliest opportunity.

The contractors Site Manager will ensure that fully detailed records are maintained of any 'incident/event' likely to cause harm to the environment. Contractors who report an incident will ensure details are identified and recorded.

Environmental incidents will be recorded on an appropriate form.

Complaints and Follow up Actions on the construction site will be managed by the Construction Manager who will ensure that all complaints are recorded according to client requirements. A complaints log will be kept and any complaint from interested parties will be actioned and recorded.

Each contractor will be responsible for ensuring that a full record and copy of all SDS pertaining to their works is kept on file and up to date in their site offices. The Contractor will also retain a duplicate copy of all SDSs held.

6 REFERENCES

BS 5228 (2009+A1:2014) *Code of practice for noise and vibration control on construction and open sites.*

CIRIA (2001) *Guideline Document C532 Control of Water Pollution from Construction Sites.*

CIRIA (2004) *Guideline Document C624 Development and Flood Risk – guidance for the construction industry.*

DoEHLG (2006) *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects.*

TII (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes.*

TII (2011) *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes.*

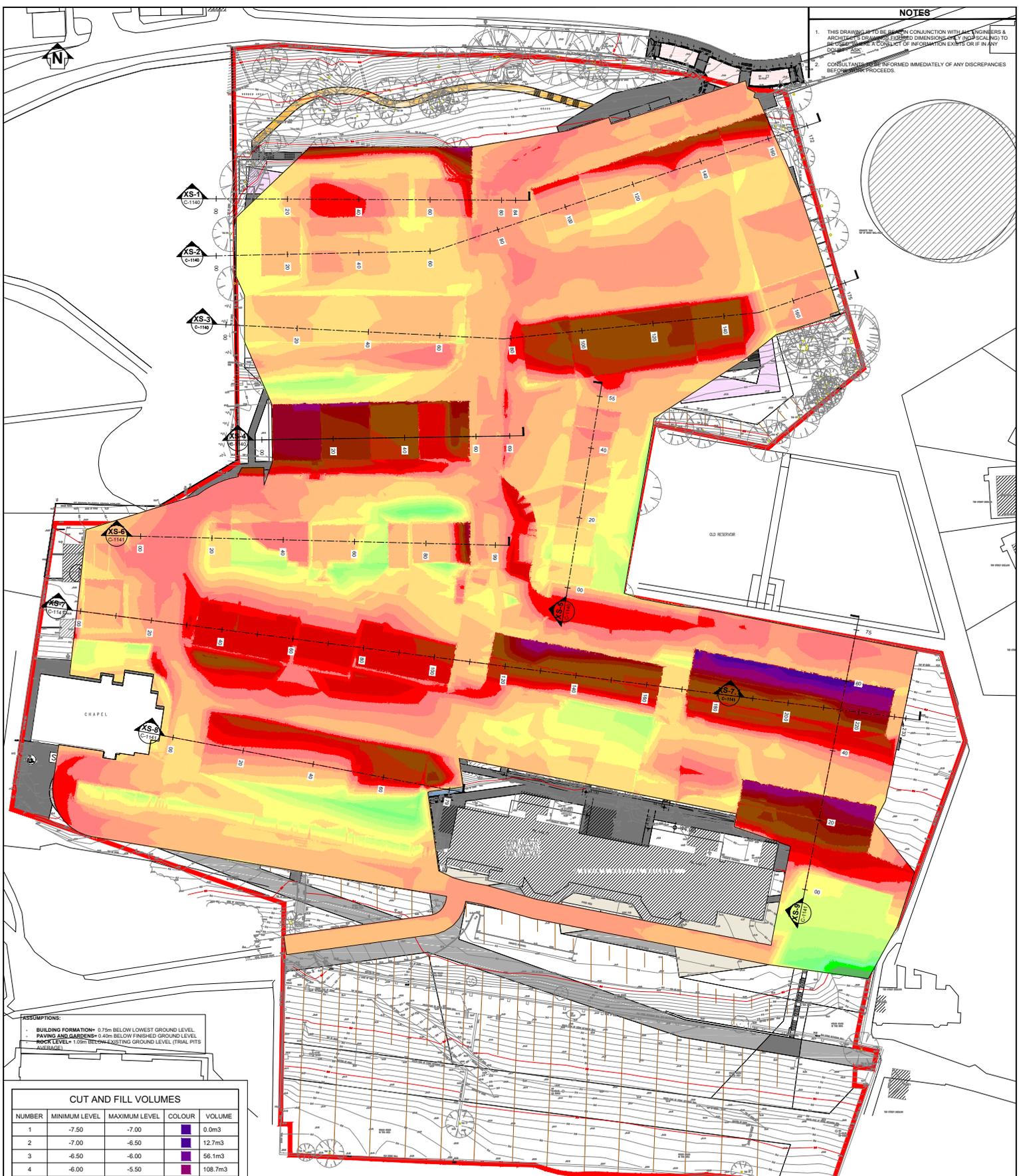
Construction Waste Management Plan DCON Safety

APPENDIX 1

Cut & Fill Drawing (Barrett Mahony Consulting Engineers)

NOTES

1. THIS DRAWING IS TO BE SEEN IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECTS' DRAWINGS. DIMENSIONS AND TOLERANCES TO BE USED SHALL BE A CONTACT OF INFORMATION EXISTS OR IF IN ANY DOUBT.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.



ASSUMPTIONS:
 - BUILDING FORMATION= 0.75m BELOW LOWEST GROUND LEVEL
 - PAVING AND GARDENING= 0.40m BELOW FINISHED GROUND LEVEL
 - ROCK LEVEL= 1.00m BELOW EXISTING GROUND LEVEL (TRIAL PITS AVERAGE)

CUT AND FILL VOLUMES				
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	VOLUME
1	-7.50	-7.00		0.0m ³
2	-7.00	-6.50		12.7m ³
3	-6.50	-6.00		56.1m ³
4	-6.00	-5.50		108.7m ³
5	-5.50	-5.00		188.4m ³
6	-5.00	-4.50		323.0m ³
7	-4.50	-4.00		493.4m ³
8	-4.00	-3.50		715.8m ³
9	-3.50	-3.00		1209.8m ³
10	-3.00	-2.50		1836.9m ³
11	-2.50	-2.00		2608.0m ³
12	-2.00	-1.50		3469.1m ³
13	-1.50	-1.00		4703.2m ³
14	-1.00	-0.50		6822.5m ³
15	-0.50	0.00		10672.7m ³
16	0.00	0.50		3084.8m ³
17	0.50	1.00		1531.9m ³
18	1.00	1.50		702.4m ³
19	1.50	2.00		295.5m ³
20	2.00	2.50		108.6m ³
21	2.50	3.00		47.2m ³
22	3.00	3.50		26.1m ³
23	3.50	4.00		16.5m ³
24	4.00	4.50		5.9m ³

GROSS ROCK CUT= 14 751m³
 GROSS SOFT CUT= 16 476m³
 TOTAL GROSS CUT= 33 221m³
 GROSS FILL= 5 819m³
 TOTAL GROSS FILL= 5 819m³
 TOTAL NET CUT= 27 402m³

CUT AND FILL EXERCISE TO FORMATION LEVEL
 SCALE @ A1: 1:1
 SCALE @ A3: 1:2

ISSUE	DATE	FOR INFORMATION	BY	CHKD	APP'D
P1	10.03.20				
DRAWING STAGE: PRELIMINARY					
BM Dublin Office: Sandwell House, 50-54 Lower Sandwell Street, Dublin 2, Ireland. Tel: (01) 877 3200 Fax: (01) 877 3164 London Office: 12 Mill Street, London SE1 2AY, United Kingdom Tel: (02044) 904 5413 2722 Consulting Engineers, Civil, Structural, Project Management. E-mail: bm@bm.co.uk Web: www.bm.co.uk					
CLIENT: LAND DEVELOPMENT AGENCY					
PROJECT TITLE: ST. KEVINS, SHANAKIEL, CORK				BM PROJECT NO.: 19305	
MODEL REFERENCE: BM-CID-M-PROPOSED SURFACE (FORMATION LEVELS)				MODEL REV: SUBMITABILITY: 	
DRAWING TITLE: CUT AND FILL EXERCISE TO FORMATION LEVEL					
DRAWING NO.: STK-BMD-ZZ-XX-DR-C-1041					ISSUE: P1